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The 7th International Verification of Neural Networks Competition (VNN-COMP 2026): Summary and Results

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Abstract

This report summarizes the seventh International Verification of Neural Networks Competition (VNN-COMP 2026), held as part of the Symposium on AI Verification (SAIV) co-located with the International Conference on Computer-Aided Verification (CAV) at FLoC 2026 in Lisbon, Portugal. The goal of the competition is to provide an objective comparison of the state-of-the-art methods in neural network verification, in terms of scalability and speed. Along this line, we used standard formats (ONNX for neural networks and VNNLIB for specifications), standard hardware (all tools are run by the organizers on AWS), and tool parameters provided by the tool authors. This report summarizes the rules, benchmarks, participating tools, results, and lessons learned from this competition.

1 Introduction

Deep-learning-based systems are increasingly being deployed in a wide range of domains, including recommendation systems, computer vision, and autonomous driving. While the nominal performance of these methods has increased significantly over the last years, they largely lack formal guarantees on their behavior. However, in safety-critical applications, including autonomous systems, robotics, cybersecurity, and cyber-physical systems (CPS), such guarantees are essential for certification and reliability.

While the literature on the verification of traditionally designed systems is wide and successful, neural network verification remains an open problem, despite significant efforts over the last years. In 2020, the International Verification of Neural Networks Competition (VNN-COMP) was established to facilitate comparison between existing approaches, bring researchers working on this problem together, and help shape future directions of the field. VNN-COMP has been held annually since then [16, 97, 24, 23, 22, 72]. In 2026, the 7th iteration of the annual VNN-COMP[1] was held as a part of the third International Symposium on AI Verification (SAIV) [7] that was collocated with the 38th International Conference on Computer-Aided Verification (CAV) [8].

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[1] http://vnn-comp.github.io/

This 7th iteration of the VNN-COMP continues last year's trend of increasing standardization and automatization, aiming to enable a fair comparison between the participating tools and to simplify the evaluation of a large number of tools on a variety of (real-world) problems. As in the last iteration, VNN-COMP 2026 standardizes (1) neural network and specification formats, ONNX for neural networks and VNN-LIB [35] for specifications, (2) evaluation hardware, providing participants the choice of a range of cost-equivalent AWS instances with different trade-offs between CPU and GPU performance, and (3) evaluation pipelines, enforcing a uniform interface for the installation and evaluation of tools.

The competition was kicked off with the solicitation for participation in February 2026. Rule discussion started in March and rules were finalized in May 2026 (see an overview in Section 2). From April to June 2026, benchmarks were proposed and discussed. Meanwhile, the organizing team decided to continue using AWS as the evaluation platform and started to implement an automated submission and testing system for both benchmarks and tools. By mid-July 2026, eleven teams submitted their tools and the organizers evaluated all entrants to obtain the final results, discussed in Section 6 and presented at SAIV on July 24, 2026. Discussions were structured into three issues on the official GitHub repository[2]: rules discussion, benchmarks discussion, and tool submission. All submitted benchmarks[3] and final results[4] were aggregated in separate GitHub repositories.

The remainder of this report is organized as follows: Section 2 discusses the competition rules, Section 4 lists all participating tools, Section 5 lists all benchmarks, Section 6 summarizes the results, and Section 7 concludes the report, discussing potential future improvements.

[2] https://github.com/VNN-COMP/vnncomp2026/issues
[3] https://github.com/VNN-COMP/vnncomp2026_benchmarks
[4] https://github.com/VNN-COMP/vnncomp2026_results

2 Rules

Terminology An *instance* is defined by a property specification (pre- and post-condition), a network, and a timeout. For example, one instance might consist of an MNIST classifier with one input image, a given local robustness threshold ϵ, and a specific timeout. A *benchmark* is defined as a set of related instances. For example, one benchmark might consist of a specific MNIST classifier with 100 input images, potentially different robustness thresholds ϵ, and one timeout per input.

Run-time caps Run-times are capped on a per-instance basis, i.e., any verification instance will timeout (and be terminated) after at most X seconds, determined by the benchmark proposer. These can be different for each instance. The total per-benchmark runtime (sum of all per-instance timeouts) may not exceed 6 hours per benchmark. For example, a benchmark proposal could have six instances with a one-hour timeout, or 100 instances with a 3.6-minute timeout, each. To enable a fair comparison, we measure the startup overhead for each tool by running it on a range of tiny networks and subtract the minimal overhead from the total runtime.

Hardware To allow for comparability of results, all tools were evaluated on equal-cost hardware using Amazon Web Services (AWS). Each team could decide between a range of AWS instance types (see Table 1) providing a CPU, GPU, or mixed focus.

Table 1: Available AWS instances.

	vCPUs	RAM [GB]	GPU
p3.2xlarge	8	61	V100 GPU with 16 GB memory
m5.16xlarge	64	256	✗
g5.8xlarge	32	128	A10G GPU with 24 GB memory

Scoring The final score is aggregate as the sum of all benchmark scores. Each benchmark score is the number of points (sum of instance scores discussed below) achieved by a given tool, normalized by the maximum number of points achieved by any tool on that benchmark. Thus, the tool with the highest sum of instance scores for a benchmark will get a benchmark score of 100, ensuring that all benchmarks are weighted equally, regardless of the number of constituting instances.

Instance score Each instance is scored is as follows:

- Correct hold (property proven): 10 points;
- Correct violated (counterexample found): 10 points;
- Incorrect result: -150 points (penalty increased compared to 2022);
- Timeout / Runtime Error / Unknown: 0 points.

However, the ground truth for any given instance is generally not known a priori. In the case of disagreement between tools, we, therefore, place the burden of proof on the tool claiming that a specification is violated, i.e., that a counterexample can be found, and deem it correct exactly if it produces a valid counterexample.

The provided counterexamples were supposed to define both the input and the resulting output of the networks. However, for some tools and instances, the output definition was

either missing or differed from the network output as computed by the onnxruntime package used to evaluate counterexamples (by performing inference given the inputs). The competition rules were ambiguous how this would be handled. We decided to discard all outputs in the counterexample files and base the evaluation solely on the given inputs and their respective outputs as computed by the onnxruntime.

Time bonus As in the previous year, no time bonus was awarded. Instead, all tools that compute the correct result within the time limit receive the same amount of points.

Overhead Correction The overhead of tools was measured, but only used to adapt the timeouts. It did not influence the scores, as no time bonus was awarded. To measure the tool-specific overhead, we created trivial network instances and included those in the measurements. We then observed the minimum verification time over all instances and considered that to be the overhead time for the tool.

Format As since 2021, we standardized neural networks to be in `onnx` format, specifications in `vnnlib` format, and counterexamples in a format similar to the `vnnlib` format. Further, tool authors were required to provide scripts fully automating the installation process of their tool, including the acquisition of any licenses that might be needed. Similar to the previous year, a preparation and execution script had to be provided for running their tool on a specific instance consisting of a network file, specification file, and timeout. The specifications are interpreted as definitions of counterexamples, meaning that a property is proven "correct" if the specification is shown to be unsatisfiable, conversely, the property is shown to be violated if a counterexample fulfilling the specification is found. Specifications consisted of disjunctions over conjunctions in both pre- and post-conditions, allowing a wide range of properties from adversarial robustness over multiple hyper-boxes to safety constraints to be encoded. For example, robustness with respect to inputs in a hyper-box had to be encoded as disjunctive property, where any of the other classes is predicted.

Tracks Since VNN-COMP'24, the competition is split into two tracks, both of them scored: A "regular" track, and an "extended" track. The regular track consists of benchmarks selected by the tool participants based on a voting process, where a benchmark is included in the regular track if at least 50% of tool participants voted for it to be scored. Benchmarks with at least 1 vote and not included in the regular track were scored in the extended track. All benchmarks received at least one vote, so no benchmark was unscored.

3 Changes compared to previous edition

This section list the main differences in the competition organization compared to the previous year.

3.1 Support for a new benchmark format

Since the second edition of VNN-COMP, the VNN-LIB format [35] was chosen as a standard input format for the competition. VNN-LIB 1.0 was a subset of the SMT-LIB [19] language, widely used in Satisfaction Modulo Theory (SMT) solvers. Its simplicity allowed easy parsing by each prover.

However, VNN-LIB 1.0 lacked a well-defined syntax and a standardised parser, which resulted in each too having to re-implement their own parser and subtle differences in the syntax accepted by each tool. Furthermore, VNN-LIB 1.0 was insufficiently expressive [32], lacking for instance the ability to specify neural network types, properties involving linear arithmetic constraints, properties involving multiple applications of the same network or multiple applications of a single network.

In order to resolve these problems, VNN-LIB 2.0 was developed and released this year [101]. Compared to its predecessor, VNN-LIB 2.0 has a formal grammar, rigorous typing, handles nonlinear operations and multiple network declarations. Version 2.0 of the standard was accompanied by parsers for various programming languages, including C++, Python, Julia and Ocaml. Benchmark proposers were keen to adopt this new version, with all benchmarks in the regular track providing a VNN-LIB 2.0 version of their specification. Some benchmarks in the extended version provided VNN-LIB 2.0-only versions. Tools developers were able to handle most of VNN-LIB 2.0 benchmarks, and fell back to the 1.0 version whenever unknown constructs were met.

The aim next year is to move fully to VNN-LIB 2.0 as well as simplifying the competition infrastructure by using the standardised command-line format provided by the standard.

3.2 Hardened counter-example validation

For VNN-COMP 2026, the validation of counterexamples returned by participating tools was revised to address ambiguities arising from numerical tolerances. Counterexample validation is inherently challenging because verification specifications describe precise constraints, while both verification tools and the reference execution of ONNX networks rely on finite-precision floating-point arithmetic. Previous editions accommodated such numerical discrepancies by allowing violations of the specification constraints within a fixed tolerance. However, applying a tolerance directly to the feasible region changes the verification problem itself: an instance that is `unsat` under the original specification may become `sat` after its constraints are relaxed. Consequently, two contradictory answers could in principle both be considered correct, with one verifier proving the original property and another returning a counterexample that only satisfies the tolerance-relaxed specification.

For VNN-COMP 2026, submitted counterexamples were therefore validated against the original input specification without tolerance. The submitted input was evaluated in a fixed reference environment using ONNX Runtime 1.26.0 and ONNX 1.21.0 under Python 3.12 on CPU of the tool author's chosen evaluation hardware, and the resulting outputs were checked against the original VNN-LIB output constraints. A counterexample was classified as `CORRECT` only if the input and the reference network output satisfy the specification without tolerance,

and only such counterexamples received the regular score for a correct `sat` result. At the same time, requiring exact agreement on the output constraints would introduce a different problem: a mathematically valid counterexample close to the decision boundary may be evaluated slightly differently by a verification tool and by the reference ONNX Runtime execution due to floating-point arithmetic, different implementations of network operations, or different evaluation orders. Counterexamples whose inputs satisfy the specification exactly and whose reference outputs satisfy the output constraints only up to an absolute tolerance of 10^{-4} are therefore classified separately as `CORRECT_WITH_TOLERANCE`. These results received full points (*i.e.*, were not penalised as `INCORRECT`), but did not establish a correct `sat` result that could be used to penalise `unsat` results given by other tools.

This rule does not completely eliminate the fundamental numerical challenges of counterexample validation. In particular, the output of the fixed reference implementation is itself a finite-precision computation and is not necessarily identical to the real-arithmetic semantics implicitly assumed by many verification algorithms. Counterexamples located extremely close to a property boundary may consequently still change classification depending on numerical details of network execution. Fixing the ONNX Runtime version, execution platform, and numerical tolerance makes this behavior reproducible for the competition, but cannot provide an implementation-independent notion of validity for such borderline cases. The revised rule therefore represents a compromise: numerical tolerances are prevented from enlarging the input domain or turning an originally `unsat` problem into a valid `sat` result, while small numerical discrepancies in network evaluation are not penalised.

3.3 Open-sourcing the evaluation platform

We published the evaluation platform: https://github.com/VNN-COMP/vnn-eval-platform.

With more tool authors participating in ever more benchmarks, this comes with a high financial cost to run all submissions on AWS instances. Open-sourcing the evaluation platform enables anyone wanting to participate to set up their own instance of the VNN-COMP evaluation platform on their internal lab server. Any submission to such a local instance then mimics an execution on an AWS instance by running the same benchmark orchestration within a Docker container, thus enabling thorough testing of any tool ahead of the actual submission without stressing our budget. In the future, this also makes it easier for us to move off running VNN-COMP on AWS.

We are aware that this assumes that anyone who wants to participate has access to some server they can utilize for this; let us know if this is not the case, and, more broadly, do not hesitate to open an issue on the GitHub repository in case you encounter any bugs, have feature requests, or want to share other thoughts!

4 Participants

We list the tools and teams that participated in the VNN-COMP 2026 in Table 2 and reproduce their own descriptions of their tools below.

Table 2: Summary of the key features of participating tools. The hardware column describes the used AWS instance with `p3` and `g5` making GPUs available, see Table 1 for more details. Licenses refer to the external licenses required to use the corresponding tool, not the licensing of the tool itself.

Tool	References	Organizations	Place	Hardware	Licenses
α,β-CROWN	[131, 132, 126, 137, 105]	UIUC, UCLA, Drexel, Duke, RWTH Aachen	**1**	g5	GUROBI
ACT	[135, 53, 100, 90, 136]	University of New South Wales	10	g5	GUROBI (optional)
Agate	-	None	13	g5	-
Bright	[111, 132, 126]	University of Kent	7	g5	-
CORA	[10, 79, 80, 78, 84]	Technical University of Munich	6	g5	MATLAB
NeuralSAT	[43, 48, 45]	George Mason University	4	g5	GUROBI
nnenum	[17, 14]	Stony Brook University	11	m5	-
NNV	[121, 91, 123]	Vanderbilt University	5	g5	MATLAB
n2v	[103]	Vanderbilt University	8	g5	-
PyRAT	[87, 85]	Université Paris-Saclay, CEA-List	3	g5	closed source CEA license
SobolBox	[5]	IIT Gandhinagar	12	m5	-
SuperSimple	-	RWTH Aachen	9	m5	-
Vibecheck	[15, 18]	Stony Brook University	2	g5	-

4.1 α,β-CROWN

Team Co-leaders: Xiangru Zhong (student lead) and Huan Zhang (faculty advisor); Team members: Duo Zhou, Lei Huang, Yifei Li, Jingyi Wang, Xuanle Li, Ashmit Dutta, Lingyin Zhang. All members are from the University of Illinois Urbana-Champaign (UIUC).

The team **acknowledges** Hesun Chen, Haoyu Li, Ruize Gao, Hao Cheng, and Taobo Liao, who were involved in the development of the verifier in the year of 2026 but did not directly work on any benchmarks of the competition. A full list of contributors is available at `https://abcrown.org`.

Description α,β-CROWN (`alpha-beta-CROWN`) is an efficient neural network verifier based on the linear bound propagation framework and built on a series of works on bound-propagation-based neural network verifiers: CROWN [138], auto_LiRPA [131], α-CROWN [132], β-CROWN [126], GCP-CROWN [137], GenBaB [105], BICCOS [141]. The core techniques in α,β-CROWN combine the efficient and GPU-accelerated linear bound propagation method with branch-and-bound methods specialized for neural network verification.

The linear bound propagation algorithms in α,β-CROWN are based on our `auto_LiRPA` library [131], which supports general neural network architectures (including convolutional layers, pooling layers, residual connections, recurrent neural networks, Transformers, and general computation graphs) and a wide range of nonlinear functions (e.g., ReLU, tanh, trigonometric functions, sigmoid, max pooling and average pooling), and is efficiently implemented on GPUs with Pytorch and CUDA. We jointly optimize intermediate layer bounds and final layer bounds

using gradient ascent (referred to as α-CROWN or optimized CROWN/LiRPA [132]). Most importantly, we use branch and bound [25] (BaB) and incorporate split constraints in BaB into the bound propagation procedure efficiently via the β-CROWN algorithm [126], use cutting-plane method in GCP-CROWN [137] and BICCOS [141] to further tighten the bound, and support general nonlinearities in the branch-and-bound by GenBaB [105]. For smaller networks, we also use a mixed integer programming (MIP) formulation [114] combined with tight intermediate layer bounds from α-CROWN (referred to as α-CROWN + MIP [137]). The combination of efficient, optimizable and GPU-accelerated bound propagation with BaB produces a powerful and scalable neural network verifier.

Link https://github.com/Verified-Intelligence/alpha-beta-CROWN (main version)

Competition submission https://github.com/Verified-Intelligence/alpha-beta-CROWN_vnncomp2026 (only for reproducing competition results; please use the main version for other purposes)

Hardware and licenses CPU and GPU with 32-bit or 64-bit floating point; Gurobi license required for certain benchmarks.

Participated benchmarks All benchmarks.

4.2 ACT

Team Guanqin Zhang, Yulei Sui (University of New South Wales, Sydney).

Description ACT (Abstract Constraint Transformation) is an open-source framework for neural network testing and verification, built around a three-tier architecture comprising a front-end, back-end, and pipeline, with native PyTorch support.

The front-end supports model and specification synthesis and translation, converting diverse models and specifications into ACT's intermediate representation (IR). The back-end performs abstract execution and tensor-based branch-and-bound refinement, with constraint generation decoupled from constraint solving. Its search design draws on several prior works, including eager falsification [56], stochastic optimization-based falsification [135], MCTS-based exploration [53], and verdict boundary mining [100], among others. ACT's back-end also checks consistency between sampled concrete executions and the abstract bounds produced by abstract execution to detect unsoundness in verifier implementations [90].

Finally, the ACT pipeline connects the front-end and back-end and provides tensor-based testing and verification capabilities, including fuzzing [136]. This enables parallel mutation, execution, and property checking across different test inputs, while tensor-based refinement of verification subproblems exploits CPU/GPU parallelism to scale branch-and-bound-based verification.

Link https://github.com/SVF-tools/ACT

Commit 492d904d5bc2bb09438a538089f8381d0d75fe4e

Hardware and licenses CPU and GPU; Gurobi license (optional).

Participated Benchmarks `acasxu_2023`, `cersyve`, `challenging_certified_training_2026`, `cifar100_2024`, `cora_2024`, `dist_shift_2023`, `malbeware`, `relusplitter_2026`, `safenlp_2024`, `sat_relu`, `tinyimagenet_2024`, `tllverifybench_2023`, `vggnet16_2022`, `vit_2023`.

4.3 Agate

Team David Shriver (unaffiliated).

Description Agate is an early implementation of a neural network verification framework. It is still a work in progress. Agate takes in an ONNX model and behavior specification (such as a VNNLIB 2.0 counter example specification) and transforms them into a single model that expresses the satisfiability of the problem. This transformation is similar to the one used by DNNF [109], but combines all subproblems into a single model. The initial implementation submitted encompassed a simple adversarial attack solver and basic interval bound propagation with input branch and bound for complete verification. These approaches were run in parallel and both used the GPU, except for very small models. The only benchmark specific tuning done was to reduce the batch size for benchmarks with large models. The backend was implemented in Jax and supported most common ONNX operators, but notably, could not support operations with input dependent output shapes, such as dynamic slicing, at the time of submission. It uses a custom VNNLIB parser that did not support strict inequality at the time of submission. Finally, a last minute bug in the counter-example post-processor resulted in invalid witnesses, contributing to our poor competition performance. This bug has since been fixed, and our test suite is significantly improved to detect such regressions in the future.

Link https://github.com/veridnn/agate-vnncomp2026

Commit a1227f8c46e215e723de35a620e2105a8b4f83aa

Hardware and licenses CPU and GPU. Full source available on request.

Participated Benchmarks `acasxu_2023`, `cersyve`, `cgan2026`, `challenging_certified_training_2026`, `collins_rul_cnn_2022`, `cora_2024`, `dist_shift_2023`, `linearizenn_2024`, `lsnc_relu`, `malbeware`, `metaroom_2023`, `ml4acopf_2024`, `nn4sys`, `relusplitter_2026`, `safenlp_2024`, `sat_relu`, `tllverifybench_2023`.

4.4 Bright

Team Max Peeperkorn and Elena Botoeva (University of Kent)

Description Bright is a composable branch-and-bound neural network verifier written in JAX. It implements state-of-the-art GPU-accelerated bound propagation techniques [111, 132, 126] and is designed as a versatile research tool that emphasises customisation to easily integrate custom branching heuristics and procedures to offload domains to MIP under certain conditions. The tool is still under development and currently supports fully-connected and convolutional networks with ReLU activations.

Links https://git.cs.kent.ac.uk/bright/bright-vnncomp-2026

Commit b2351384b23233b440ee35fd64dc6e3d54d08da6

Hardware and licenses CPU and GPU, Gurobi Licence

Participated benchmarks acasxu_2023, cifar100_2024, cora_2024, linerizenn_2024, malbeware, metaroom_2023, relusplitter_2026, safenlp_2024, sat_relu, tinyimagenet_2024, tllverifybench_2023

4.5 CORA

Team Lukas Koller, Tobias Ladner, Benedikt Kellner, Matthias Althoff (Technical University of Munich).

Description CORA [10, 11] enables the formal verification of neural networks, both in open-loop as well as in closed-loop scenarios [78, 84]. Open-loop verification refers to the task where properties of the output set of a neural network are verified, e.g., correctly classified images given noisy input, as also considered at VNN-COMP. In closed-loop scenarios, the neural network is used as a controller of a dynamic system, e.g., controlling a car while keeping a safe distance

over some time horizon. Moreover, CORA can also train robust neural networks [79, 129], which uses an efficient batch-wise propagation of zonotopes through a neural network on a GPU.

For the competition, reachability analysis with zonotopes is used to compute a convex enclosure of the output set of a neural network. In addition to simultaneous input and neuron splitting, a specification-driven input refinement procedure iteratively encloses the set of unsafe inputs [80]. All operations use batch-wise computations to take full advantage of GPU-acceleration. Further details on our approach can be found in our competition contribution paper [81].

Link https://github.com/toladnertum/vnncomp-cora-2026

Commit 798551ab7e7cba1c2c8a3a14726478cbfc8690e6

Hardware and licenses GPU, MATLAB license.

Participated Benchmarks `acasxu`, `cersyve`, `cgan2026`, `challenging_certified_training_2026`, `cifar100_2024`, `collins_rul_cnn_2022`, `cora_2024`, `dist_shift_2023`, `linearizenn_2024`, `malbeware`, `metaroom_2023`, `nn4sys`, `safenlp_2024`, `sat_relu`, `soundnessbench_2026`, `tinyimagenet_2024`, `tllverifybench_2023`, `isomorphic_acasxu_2026`, `monotonic_acasxu_2026`.

4.6 NeuralSAT

Team Hai Duong and Thanhvu Nguyen (George Mason).

Description NeuralSAT [43, 48, 45, 42, 46, 44, 38, 41, 47, 39, 40] integrates conflict-driven clause learning (CDCL) in SAT/SMT-solving with an DNN abstraction-based theory solver for infeasibility checking. NeuralSAT implements the DPLL(T) framework used in modern SMT solvers such as Z3. The design of NeuralSAT is inspired by the core algorithms used in SMT solvers such as CDCL components and theory solving. The tool is written in Python and uses Gurobi for LP solving. Unlike many other modern NNV tools, NeuralSAT *does not* require parameter tuning and works out of the box, e.g., the tool runs on the wide-range of benchmarks in VNN-COMPs without any tuning.

Link https://github.com/dynaroars/neuralsat

Commit 8c6a493d2b9314b06c6f19cd452f1c7ab5bd2657

Hardware and licences GPU, Gurobi License

Participated benchmarks All benchmarks in the regular track.

4.7 nnenum

Team Doug Wehbe, Eli Pregerson, Stanley Bak (Stony Brook University)

Description The nnenum tool [14] uses multiple levels of abstraction to achieve high-performance verification of ReLU networks without sacrificing completeness [13]. The core verification method is based on reachability analysis using star sets [119], combined with the ImageStar method [116] to propagate sets through all linear layers supported by the ONNX runtime, such as convolutional layers with arbitrary parameters. The tool is written in Python 3 and uses GLPK for LP solving. This year we improved handling of sparse transformations like convolution layers to use less memory, as well as added some support for residual connections.

Link https://github.com/wehbedoug/nnenum-2026

Commit fa2a14d736973bfb728856afaffa35ed6cfae0ef

Hardware and licences CPU, Gurobi license (optional)

Participated benchmarks `acasxu`, `cgan`, `collins-rul-cnn`, `cora`, `linearizenn`, `metaroom`, `nn4sys`, `relusplitter`, `safeNLP`, `sat-relu`, `tllverifybench`, `vggnet16`.

4.8 NNV

Team Samuel Sasaki, Anne M. Tumlin, Ben Wooding, Taylor T. Johnson (Vanderbilt University)

Description The Neural Network Verification (NNV) Tool [121, 91, 92, 123] is a formal verification software tool for deep learning models and cyber-physical systems with neural network components written in MATLAB and available at https://github.com/verivital/nnv. NNV uses a star-set state-space representation and reachability algorithm that allows for a layer-by-layer computation of exact or overapproximate reachable sets for feed-forward [119], convolutional [116], semantic segmentation (SSNN) [120], and recurrent (RNN)[118] neural networks, as well as neural network control systems (NNCS) [117, 121] and neural ordinary differential equations (Neural ODEs) [95]. NNV3, the latest version [123], considers weight perturbations [143, 144], graph neural networks (GNNs) [124], videos [102], and fairness [122]. The star-set based algorithm is naturally parallelizable, which allows NNV to be designed to perform efficiently on multi-core platforms. Additionally, if a particular safety property is violated, NNV can be used to construct and visualize the complete set of counterexample inputs for a neural network (exact-analysis). For this competition, updated from last year's, we tailor the solver approach depending on the benchmark at hand, although all follow a similar flow. First, we perform a simulation-guided search for counterexamples for a fixed number of samples. If no counterexamples are found (i.e., demonstrate that the property is SAT), then we utilize an iterative refinement approach using reachability analysis to verify the property (UNSAT). This consists of performing reachability analysis using a relax-approximation method [120], if not verified, then a less conservative approximation based on zonotope pre-filtering approach [115], and finally using the exact analysis when possible [116] until the specification is verified or there is a timeout. Based on the benchmark to evaluate, the initial reachability analysis may be any of the overapproximation methods or the exact method, based on the complexity of the benchmarks (size of network, input, etc). In addition to the star set-based approaches, we implement another approach based on conformal prediction that can scale better to larger networks and input sizes, although only probabilistic guarantees can be provided [57]. This is the only method that uses GPU, all others run solely on CPU.

Link https://github.com/verivital/nnv

Commit 376568b449535a779f751dd2def774a0ed94ead8

Hardware and licenses CPU and GPU, MATLAB license.

Participated Benchmarks Regular track (all) and Extended track (vggnet16, ml4acopf, reluspliter).

4.9 n2v

Team Samuel Sasaki, Ben Wooding, Anne M. Tumlin, Taylor T. Johnson (Vanderbilt University)

Description n2v [103] is an open-source Python toolbox for neural network verification, entering the competition this year. n2v is a successor to the MATLAB-based NNV tool [121, 91, 123], reimplemented in Python with native PyTorch integration to lower the barrier to adoption for the deep learning and verification communities. n2v supports exact and over-approximate reachability using star sets, zonotopes, and hyperrectangles. In addition, n2v contributes probabilis-

tic verification via conformal inference, PGD-based falsification, and a batched HiGHS-backed linear-programming pipeline.

Link https://github.com/sammsaski/n2v

Commit 2b9ddcb39ca61780353e4416fd34d9d181538478

Hardware and licenses CPU and GPU, fully open-source.

Participated Benchmarks All benchmarks.

4.10 PyRAT

Team Augustin Lemesle, Sasha Cuau, Serge Durand, Tristan Le Gall (CEA-List), Julien Lehmann (OCamlPro)

Description PyRAT (Python Reachability Assessment Tool) [87, 86] is an abstract interpretation based tool to verify the safety and robustness of neural networks. PyRAT relies on multiple zonotopic domains to efficiently compute the reachable states for various architectures of neural networks (fully-connected, convolutionnal, recurrent, transformers, ...). It supports multiple non-linear activation functions (ReLU, Sigmoid, Softmax, Floor, ...) with precise abstractions while maintaining correctness and floating-point soundness on CPU. PyRAT can also leverage GPU-parallelization to scale to large networks or to batch analyses. For smaller networks and problems, PyRAT can leverage branch and bound strategies on the inputs with heuristics like ReCIPH [49]. While on larger ReLU networks, PyRAT will use branch and bound strategies on the ReLU neurons in conjunction with fast GPU computation.

For this year competition, PyRAT extended its property support to VNN-LIB 2.0 supporting its new paradigms like multiple inputs, networks and more complex properties. Relying on our relational zonotopic domains allowed PyRAT to address these new and complex relations between inputs and networks.

Link https://git.frama-c.com/pub/pyrat

Commit 2dc848d64f987e283b6b85d739c6f5d6dfc6dd91

Hardware and licenses CPU and GPU, closed source CEA licence (free academic licence available for research purposes).

Participated benchmarks All benchmarks.

4.11 SobolBox

Team Sarthak Das (Indian Institute of Technology Gandhinagar)

Description SobolBox is a spiritual successor to the unsubmitted INNVerS [4] project, developed by Shubhajit Roy (IIT Gandhinagar) and Avishek Lahiri (IACS Kolkata) for VNNCOMP-2021, under the supervision of Dr. Rajarshi Ray (IACS Kolkata).

SobolBox [5, 33] is a Python-based black-box falsification tool for detecting safety violations in neural networks. It accepts ONNX-format models and VNNLIB 1.0 safety specifications, treating neural networks as multi-input, multi-output, non-convex black boxes without making architectural assumptions. Input bounds are extracted from VNNLIB specifications using the Z3 theorem prover, after which low-discrepancy candidate points are generated using Sobol sequence sampling [112].

The core premise of SobolBox is that safety violations, if any, are most likely to occur near the optima. A preliminary pass over Sobol samples is used to quickly detect counterexamples before optimization, if they exist. For the remaining instances, promising regions are selected from the extrema of the sampled network outputs and refined using a combination of global

PSO [74] and local L-BFGS-B optimization [26]. Candidate optima are checked for safety violations, with Sign-OPT searches [30] additionally performed around the optima to detect nearby counterexamples.

The resulting output-bound under-approximations are checked against the safety property using Z3. SobolBox reports `sat` with a counterexample when a violation is found, `unsat` when the computed output bounds exclude a violation, or `unknown` when the analysis is inconclusive. Since the computed output bounds are under-approximations, `unsat` results are high-confidence but unsound. Networks whose effective input dimension exceeds the 21,201-dimensional limit of the employed Joe-Kuo Sobol construction [65] are reported as `unknown`. SobolBox also employs memoization of black-box evaluations, parallelization, and caching of Sobol samples and computed output bounds to reduce computational overhead across runs.

For benchmarks with binary inputs and outputs, SobolBox provides an alternate discrete-search mode using rounded Sobol samples and Nevergrad's `PortfolioDiscreteOnePlusOne` optimizer; this mode does not report `unsat` since discrete search being stochastic can't mathematically prove the property holds everywhere, even within the underapproximated output bounds.

Links https://codeberg.org/tech-absurdist/SobolBox

Commit 64826496ec80bdc9f9925aefd9789d880e94272b

Hardware and licenses CPU, no license required.

Participated benchmarks `acasxu`, `cersyve`, `cgan2026`, `collins_rul_cnn_2022`, `dist_shift_2023`, `linearizenn_2024`, `metaroom_2023`, `ml4acopf_2024`, `safenlp_2024`, `sat_relu`, `tllverifybench_2023`.

4.12 SuperSimple

Team Konstantin Kaulen (RWTH Aachen University)

Description SuperSimple is an intentionally minimal and well-documented neural network verification tool developed as an educational and competition baseline for VNN-COMP. It implements a deliberately simple verification pipeline: first, it searches for counterexamples using projected gradient descent (PGD); subsequently, it attempts to prove the property using incomplete bound propagation. For the latter, SuperSimple builds on `auto_LiRPA` [131] and successively applies CROWN [138] and optimized CROWN (α-CROWN) [132]. It returns `unsat` whenever the resulting bounds suffice to prove that the given property holds, and `unknown` otherwise.

This submission of a simple tool serves several purposes. First, in light of the increasing computational demands of complete verification [71] and the complexity of configuring state-of-the-art verification systems [70], SuperSimple provides a lightweight and easy-to-use baseline for assessing how many VNN-COMP instances can already be solved using comparatively simple techniques and modest computational resources. This provides an indication of the verification performance accessible to non-expert practitioners without highly specialized verification pipelines or large-scale compute environments. Second, SuperSimple can reveal benchmarks for which such baseline techniques are already sufficient and may, in some cases, even outperform more sophisticated verification systems in terms of running time. Such cases can highlight unnecessary algorithmic overhead, suboptimal configuration, or opportunities for improving the efficiency of state-of-the-art verifiers. Finally, SuperSimple helps identify benchmarks that have become too easy to meaningfully discriminate between modern verification approaches: if almost all instances can be solved using this simple pipeline, the benchmark may be regarded as largely solved and of limited value for measuring further progress at the state of the art.

Links https://github.com/kkaulen/simple_vnn_comp_verifier

Commit 780317d108e0de8aa9b29b4773079a9c4607213e

Hardware and licenses CPU or GPU, no license required.

Participated benchmarks All benchmarks (scored and unscored).

4.13 vibecheck

Team Doug Wehbe, Stanley Bak (Stony Brook University)

Description The vibecheck formal verification tool is a high-performance, vibe-coded decision procedure for neural networks. It was created using Claude Code, mostly Opus 4.8, over the course of two months. It combines a variety of analysis techniques: bounds propagation, zonotope analysis, star set abstract domain, MILP solving, α-CROWN-style slope optimization for ReLU relaxations, and a (maybe new) high performance GPU-based branch and bound solver to handle splitting. A blog post is available [15] detailing the development process and experience.

Links https://github.com/stanleybak/vibecheck-nn

Commit 341c56bd5ca719d0935b9b6659c8610158974197

Hardware and licenses GPU, Gurobi

Participated benchmarks All benchmarks (scored and unscored).

5 Benchmarks

In this section, we provide an overview of all scored benchmarks, reproducing the benchmark proposers' descriptions. Artifacts for all benchmarks are available in the repository[5]. Table 4 presents a summary of all benchmarks. Table 3 presents statistics across all benchmarks.

Table 3: Benchmark statistics per track. **VNNLIB** lists the specification-format versions each benchmark ships; **Budget** is the sum of the per-instance timeouts in hours.

Benchmark	VNNLIB	Networks	Specs	Instances	Budget (h)
Regular track					
acasxu_2023	1.0, 2.0	45	10	186	6.0
cersyve	1.0, 2.0	12	3	12	0.3
cgan2026	1.0, 2.0	8	21	21	6.0
challenging_certified_training_2026	1.0, 2.0	6	60	60	6.0
cifar100_2024	1.0, 2.0	2	200	200	5.6
collins_rul_cnn_2022	1.0, 2.0	3	41	62	6.0
cora_2024	1.0, 2.0	9	60	180	1.5
dist_shift_2023	1.0, 2.0	1	72	72	6.0
linearizenn_2024	1.0, 2.0	10	60	60	15.0
lsnc_relu	1.0, 2.0	1	80	80	0.6
malbeware	1.0, 2.0	3	50	150	4.2
metaroom_2023	1.0, 2.0	100	100	100	5.8
ml4acopf_2024	1.0, 2.0	9	23	69	11.5
nn4sys	1.0, 2.0	11	182	194	6.0
relusplitter_2026	1.0, 2.0	104	20	120	6.0
safenlp_2024	1.0, 2.0	1	1054	1080	6.0
sat_relu	1.0, 2.0	100	100	100	2.8
soundnessbench_2026	1.0, 2.0	2	60	60	2.5
tinyimagenet_2024	1.0, 2.0	1	200	200	5.6
tllverifybench_2023	1.0, 2.0	32	32	32	5.3
traffic_signs_recognition_2023	1.0, 2.0	3	45	45	6.0
vggnet16_2022	1.0, 2.0	1	18	18	6.0
vit_2023	1.0, 2.0	2	200	200	5.6
yolo_2023	1.0, 2.0	1	72	72	6.0
Regular total		**467**	**2763**	**3373**	**132.2**
Extended track					
adaptive_cruise_control_non_linear_2026	2.0	1	50	50	1.4
cctsdb_yolo_2023	1.0, 2.0	2	39	39	3.8
collins_aerospace_benchmark	1.0, 2.0	1	6	6	6.0
isomorphic_acasxu_2026	2.0	50	50	50	1.4
monotonic_acasxu_2026	2.0	31	50	50	1.4
smart_turn_multimodal_2026	2.0	1	50	50	1.4
Extended total		**86**	**245**	**245**	**15.3**
Overall		**553**	**3008**	**3618**	**147.5**

[5] https://github.com/VNN-COMP/vnncomp2026_benchmarks

Table 4: Overview of all scored benchmarks.

Category	Benchmark	Application	Network Types	# Params	Effective Input Dim	Track
Complex	cGAN	Image Generation & Image Prediction	Conv. + Vision Transformer	500k - 68M	5	regular
	NN4Sys	Learned Index, Cardinality Estimation & Adaptive Bitrate Selection	FC + Conv1D, ReLU + Sigmoid	33k - 37M	1-308	regular
	LinearizeNN	NN controller approximation	FC. + Conv. + Vision Transformer + Residual + ReLU	203k	4	regular
	ml4acopf	Power System	Complex (ReLU + Trigonometric + Sigmoid)	4k-680k	22 - 402	extended
	ViT	Vision	Conv. + Residual + Softmax + BatchNorm	68k - 76k	3072	extended
	Collins Aerospace	-	FC + Conv. + Residual, LeakyReLU + MaxPool + Square	1.8M	1.2M	extended
	LSNC-ReLU	Lyapunov stability of NN controllers	FC, ReLU	275	6	extended
	CCTSDB	-	FC + Conv. + Residual, ReLU + MaxPool + Clip	100k	2	extended
CNN & ResNet	Collins RUL CNN	Condition Based Maintenance	Conv. + ReLU, Dropout	60k - 262k	400 - 800	regular
	VGGNet16	Image Classification	Conv. + ReLU + MaxPool	138M	150k	extended
	Traffic Signs Recognition	Image Classification	Conv. + Sign + MakPool + BatchNorm	905k - 1.7M	2.7k - 12k	extended
	cifar100	Image Classification	FC + Conv. + Residual, ReLU + BatchNorm	2.5M - 3.8M	3072	regular
	tinyimagenet	Image Classification	FC + Conv. + Residual, ReLU + BatchNorm	3.6M	9408	regular
	Metaroom	-	Conv. + FC, ReLU	466k - 7.4M	5376	regular
	Yolo	-	FC + Conv. + Residual, ReLU + Sigmoid	22k - 37M	1 - 308	extended
	SoundnessBench	Verifier Test	FC + Conv. + ReLU	1.7M	12k	regular
	Relusplitter	Meta-Benchmark	FC + Conv. + ReLU	13k - 625k	5 - 3k	extended
	MalBeWare	Malware Classification	FC + Conv. + ReLU	102k - 1.5M	4k	regular
	cersyve	Neural Certificates for Control Systems	FC + Residual + ReLU	1k - 4k	2 - 6	regular
FC	TLL Verify Bench	Two-Level Lattice NN	Two-Level Lattice NN (FC. + ReLU)	17k - 67M	2	regular
	Acas XU	Collision Detection	FC. + ReLU	13k	5	regular
	Dist Shift	Distribution Shift Detection	FC. + ReLU + Sigmoid	342k - 855k	792	regular
	safeNLP	Sentence classification	FC. + ReLU	4k	30	regular
	CORA	Image Classification	FC. + ReLU	575k, 1.1M	784, 3072	regular
	SAT ReLU	Verifier Test	FC. + ReLU	100-35k	2 - 100	regular

5.1 cGAN

Proposed by Feiyang Cai, Ali Arjomandbigdeli, Stanley Bak (Stony Brook University)

Motivation While existing neural network verification benchmarks focus on discriminative models, the exploration of practical and widely used generative networks remains neglected in terms of robustness assessment. This benchmark introduces a set of image generation networks specifically designed for verifying the robustness of the generative networks.

Networks The generative networks are trained using conditional generative adversarial networks (cGAN), whose objective is to generate camera images that contain a vehicle obstacle located at a specific distance in front of the ego vehicle, where the distance is controlled by the input distance condition. The network to be verified is the concatenation of a generator and a discriminator. The generator takes two inputs: 1) a distance condition (1D scalar) and 2) a noise vector controlling the environment (4D vector). The output of the generator is the generated image. The discriminator takes the generated image as input and outputs two values: 1) a real/fake score (1D scalar) and 2) a predicted distance (1D scalar). Several different models with varying architectures (CNN and vision transformer) and image sizes (32x32, 64x64) are provided for different difficulty levels.

Specifications The verification task is to check whether the generated image aligns with the input distance condition, or in other words, verify whether the input distance condition matches the predicted distance of the generated image. In each specification, the inputs (condition distance and latent variables) are constrained in small ranges, and the output is the predicted distance with the same center as the condition distance but with slightly larger range.

Link https://github.com/feiyang-cai/cgan_benchmark2023

5.2 NN4Sys

Proposed by the α,β-CROWN team with collaborations with Shuyi Lin and Cheng Tan at Northeastern University.

Application The benchmark contains networks for database learned index, video streaming learned adaptive bitrate, and learned cardinality estimation which map inputs from various dimensions to 1-dimension outputs.

- *Background*: learned index, learned cardinality, and learned adaptive bitrate are all instances in neural networks for computer systems (NN4Sys), which are neural network based methods performing system operations. These classes of methods show great potential but have one drawback—the outputs of an NN4Sys model (a neural network) can be arbitrary, which may lead to unexpected issues in systems.

- *What to verify*: our benchmark provides multiple pairs of (1) trained NN4Sys model and (2) corresponding specifications. We design these pairs with different parameters such that they cover a variety of user needs and have varied difficulties for verifiers. We describe benchmark details in our NN4SysBench paper [89].

- *Translating NN4Sys applications to a VNN benchmark*: the original NN4Sys applications have some sophisticated structures that are hard to verify. We tailored the neural networks and their specifications to be suitable for VNN-COMP. For example, learned index [83] contains multiple NNs in a tree structure that together serve one purpose. However, this cascading structure is inconvenient/unsupported to verify because there is a "switch" operation—choosing one NN in the second stage based on the prediction of the first stage's NN. To convert learned indexes to a standard form, we train a monolithic (larger) NN.

- *A note on broader impact*: using NNs for systems is a broad topic, but many existing works lack strict safety guarantees. We believe that NN Verification can help system developers gain confidence to apply NNs to critical systems. We hope our benchmark can be an early step toward this vision.

Networks This benchmark has eleven networks with different parameters: two for learned indexes, four for learned cardinality estimation and five for learned adaptive bitrate. The learned index uses fully-connected feed-forward neural networks. The other two—the learned cardinality and the learned adaptive bitrate—have a relatively sophisticated internal structure. Please see our NN4SysBench paper [89] for details.

Specifications For learned indexes, the specification aims to check if the prediction error is bounded. The specification is a collection of pairs of input and output intervals such that any input in the input interval should be mapped to the corresponding output interval. For learned cardinality estimation and learned adaptive bitrate, the specifications check the prediction error bounds (similar to the learned indexes) and monotonicity of the networks. By monotonicity specifications, we mean that for two inputs, the network should produce a larger output for the larger input, which is required by cardinality estimation or adaptive bitrate.

Link: https://github.com/Khoury-srg/VNNComp26_NN4Sys

5.3 LinearizeNN

Proposed by Ali Arjomandbigdeli, Stanley Bak (Stony Brook University).

Motivation Assuming having a neural network controller approximation with a piecewise linear model in the form of a set of linear models with added noise to account for local linearization error. The objective of this benchmark is to investigate the neural network output falls within the range we obtain from our linear model output plus some uncertainty. The idea of this benchmark came from one of our recent paper [12] in which we approximated the NN controller with a piecewise linear model, and we wanted to check if the neural network output falls within the range we obtained from our linear model output plus some uncertainty.

Networks The neural network controller we used in this benchmark is an image-based controller for an Autonomous Aircraft Taxiing System whose goal is to control an aircraft's taxiing at a steady speed on a taxiway. This network was introduced in the paper "Verification of Image-based Neural Network Controllers Using Generative Models" [68]. The neural network integrates a concatenation of the cGAN (conditional GAN) and controller, resulting in a unified neural network controller with low-dimensional state inputs. In this problem, the inputs to the neural network consist of two state variables and two latent variables. The aircraft's state is determined by its crosstrack position (p) and heading angle error (θ) with respect to the taxiway center line. Two latent variables with a range of -0.8 to 0.8 are introduced to account for environmental changes. Because in this case the output spec depends on both the input and output and considering the VNN-LIB limitation, we added a skip-connection layer to the neural network to have the input values present in the output space. We also added one linear layer after that to create a linear equation for each local model.

Specifications As mentioned earlier, the aim of this benchmark is to examine whether the neural network output stays within the range defined by the linear model's output, including a margin for uncertainty.Given input $x \in X$ and output $Y = f_{NN}(x)$, the query is of the form: $A_{mat} \times X + b + U_{lb} \leq Y \leq A_{mat} \times X + b + U_{ub}$ for each linear model in its abstraction region.

Link https://github.com/aliabigdeli/LinearizeNN_benchmark2024

5.4 ml4acopf

Proposed by Haoruo Zhao, Michael Klamkin, Mathieu Tanneau, Wenbo Chen, and Pascal Van Hentenryck (Georgia Institute of Technology), and Hassan Hijazi, Juston Moore, and Haydn Jones (Los Alamos National Laboratory).

Motivation Machine learning models are utilized to predict solutions for an optimization model known as AC Optimal Power Flow (ACOPF) in the power system. Since the solutions are continuous, a regression model is employed. The objective is to evaluate the quality of these machine learning model predictions, specifically by determining whether they satisfy the constraints of the optimization model. Given the challenges in meeting some constraints, the goal is to verify whether the worst-case violations of these constraints are within an acceptable tolerance level.

Networks The neural network designed comprises two components. The first component predicts the solutions of the optimization model, while the second evaluates the violation of each constraint that needs checking. The first component consists solely of general matrix multiplication (GEMM) and rectified linear unit (ReLU) operators. However, the second component has a more complex structure, as it involves evaluating the violation of AC constraints using nonlinear functions, including sigmoid, quadratic, and trigonometric functions such as sine and cosine. This complex evaluation component is incorporated into the network due to a limitation of the VNNLIB format, which does not support trigonometric functions. Therefore, these constraints violation evaluation are included in the neural network.

Specifications In this benchmark, four different properties are checked, each corresponding to a type of constraint violation:

1. Power balance constraints: the net power at each bus node is equal to the sum of the power flows in the branches connected to that node.
2. Thermal limit constraints: power flow on a transmission line is within its maximum and minimum limits.
3. Generation bounds: a generator's active and reactive power output is within its maximum and minimum limits.
4. Voltage magnitude bounds: a voltage's magnitude output is within its maximum and minimum limits.

The input to the model is the active and reactive load. The chosen input point for perturbation is a load profile for which a corresponding feasible solution to the ACOPF problem is known to exist. For the feasibility check, the input load undergoes perturbation. Although this perturbation does not exactly match physical laws, the objective is to ascertain whether a machine learning-predicted solution with the perturbation can produce a solution that does not significantly violate the constraints.

The scale of the perturbation and the violation threshold are altered by testing whether an adversarial example can be easily found using projected gradient descent with the given perturbation. The benchmark, provided with a fixed random seed, is robust against the simple projected gradient descent that is implemented.

Link https://github.com/AI4OPT/ml4acopf_benchmark

5.5 ViT

Proposed by the α,β-CROWN team.

Motivation Transformers [125] based on the self-attention mechanism have much more complicated architectures and contain more kinds of nonlinerities, compared to simple feedforward networks with relatively simple activation functions. It makes verifying Transformers challenging. We aim to encourage the development of verification techniques for Transformer-based models, and we also aim to benchmark neural network verifiers on relatively complicated neural network architectures and more general nonlinearities. Therefore, we propose a new benchmark with Vision Transformers (ViTs) [36]. This benchmark is developed based on our work on neural network verification for models with general nonlinearities [105].

Networks The benchmark contains two ViTs, as shown in Table 5. Considering the difficulty of verifying ViTs, we modify the ViTs and make the models relatively shallow and narrow, with significantly reduced number of layers and attention heads. Following [107], we also replace the layer normalization with batch normalization. The models are mainly trained with PGD training [93], and we also add a weighted IBP [54, 106] loss for one of the models as a regularization.

Specifications The specifications are generated from the robustness verification problem with ℓ_∞ perturbation. We use the CIFAR-10 dataset with perturbation size $\epsilon = \frac{1}{255}$ at test time. We have filtered the CIFAR-10 test set to exclude instances where either adversarial examples can be found (by PGD attack [93] with 100 steps and 1000 restarts) or the vanilla CROWN-like method [138, 107] can already easily verify. We randomly keep 100 instances for each model, with a timeout threshold of 100 seconds. Note that since instances with adversarial examples

Table 5: Networks in the ViT benchmark.

Model	PGD_2_3_16	IBP_3_3_8
Layers	2	3
Attention heads	3	3
Patch size	16	8
Weight of IBP loss	0	0.01
Training ϵ	$\frac{2}{255}$	$\frac{1}{255}$
Clean accuracy	59.78%	62.21%

have mostly been excluded during the filtering process, this version of the benchmark may not be able to reflect soundness issues in verifiers, and we refer readers to [142] for discussions on testing soundness with models including ViT.

Link https://github.com/shizhouxing/ViT_vnncomp2023

5.6 LSNC-ReLU

Proposed by the α,β-CROWN team.

Motivation We develop a benchmark for the problem of verifying the Lyapunov stability of NN controllers in nonlinear dynamical systems within a region-of-intrest and a region-of-attraction. This is important for providing stability guarantees that are essential for safety-critical applications with NN controllers. It is also a useful application of neural network verification as recently demonstrated in [133, 104], and we refer readers to those works for more details on the problem.

Networks and Specifications The NN controller and Lyapunov function are trained using the technique presented in CT-BaB [104]. Compared to a general nonlinear dynamics as in [133], we utilized a neural-network dynamics. More specifically, the dynamics of this model is given by a shallow neural network with ReLU activations that are trained to approximate the 2D quadrotor dynamics. In this way, only ReLU nonlinearity is presented in the network (no trig functions, leakyrelu, etc.). The verification goal is to certify the Lyapunov stability of the NN controller in a nonlinear dynamical system within a certain Lyapunov sublevel set ($V < c$). Specifications for the benchmark are randomly generated and consist of random rings of the form $x : c_1 < V(x) < c_2$.

Link https://github.com/xiangruzh/LSNC-ReLU

5.7 Collins-RUL-CNN

Proposed by Collins Aerospace, Applied Research & Technology (website).

Motivation Machine Learning (ML) is a disruptive technology for the aviation industry. This particularly concerns safety-critical aircraft functions, where high-assurance design and verification methods have to be used in order to obtain approval from certification authorities for the new ML-based products. Assessment of correctness and robustness of trained models, such as neural networks, is a crucial step for demonstrating the absence of unintended functionalities [50, 76]. The key motivation for providing this benchmark is to strengthen the interaction between the VNN community and the aerospace industry by providing a realistic use case for neural networks in future avionics systems [75].

Application Remaining Useful Life (RUL) is a widely used metric in Prognostics and Health Management (PHM) that manifests the remaining lifetime of a component (e.g., mechanical bearing, hydraulic pump, aircraft engine). RUL is used for Condition-Based Maintenance (CBM) to support aircraft maintenance and flight preparation. It contributes to such tasks as augmented manual inspection of components and scheduling of maintenance cycles for components, such as repair or replacement, thus moving from preventive maintenance to *predictive* maintenance (do maintenance only when needed, based on component's current condition and estimated future condition). This could allow to eliminate or extend service operations and inspection periods, optimize component servicing (e.g., lubricant replacement), generate inspection and maintenance schedules, and obtain significant cost savings. Finally, RUL function can also be used in airborne (in-flight) applications to dynamically inform pilots on the health state of aircraft components during flight. Multivariate time series data is often used as RUL function input, for example, measurements from a set of sensors monitoring the component state, taken at several subsequent time steps (within a time window). Additional inputs may include information about the current flight phase, mission, and environment. Such highly multi-dimensional input space motivates the use of Deep Learning (DL) solutions with their capabilities of performing automatic feature extraction from raw data.

Networks The benchmark includes 3 convolutional neural networks (CNNs) of different complexity: different numbers of filters and different sizes of the input space. All networks contain only convolutional and fully connected layers with ReLU activations. All CNNs perform the regression function. They have been trained on the same dataset (time series data for mechanical component degradation during flight).

Specifications We propose 3 properties for the NN-based RUL estimation function. First, two properties (robustness and monotonicity) are local, i.e., defined around a given point. We provide a script with an adjustable random seed that can generate these properties around input points randomly picked from a test dataset. For robustness properties, the input perturbation (delta) is varied between 5% and 40%, while the number of perturbed inputs varies between 2 and 16. For monotonicity properties, monotonic shifts between 5% and 20% from a given point are considered. Properties of the last type ("if-then") require the output (RUL) to be in an expected value range given certain input ranges. Several if-then properties of different complexity are provided (depending on range widths).

Link https://github.com/loonwerks/vnncomp2022

Paper Available in [75] or on request.

5.8 VGGNET16

Proposed by Stanley Bak, Stony Brook University

Motivation This benchmark tries to scale up the size of networks being analyzed by using the well-studied VGGNET-16 architecture [110] that runs on ImageNet. Input-output properties are proposed on pixel-level perturbations that can lead to image misclassification.

Networks All properties are run on the same network, which includes 138 million parameters. The network features convolution layers, ReLU activation functions, as well as max pooling layers.

Specifications Properties analyzed ranged from single-pixel perturbations to perturbations on all 150528 pixles (L-infinity perturbations). A subset of the images was used to create the specifications, one from each category, which was randomly chosen to attack. Pixels to perturb were also randomly selected according to a random seed.

Link https://github.com/stanleybak/vggnet16_benchmark2022/

5.9 Traffic Signs Recognition

Proposed by Mădălina Eraşcu and Andreea Postovan (West University of Timisoara, Romania)

Motivation Traffic signs play a crucial role in ensuring road safety and managing traffic flow in both city and highway driving. The recognition of these signs, a vital component of autonomous driving vision systems, faces challenges such as susceptibility to adversarial examples [113] and occlusions [139], stemming from diverse traffic scene conditions.

Networks Binary neural networks (BNNs) show promise in computationally limited and energy-constrained environments within the realm of autonomous driving [62]. BNNs, where weights and/or activations are binarized to ± 1, offer reduced model size and simplified convolution operations for image recognition compared to traditional neural networks (NNs).

We trained and tested various BNN architectures using the German Traffic Sign Recognition Benchmark (GTSRB) dataset [3]. This multi-class dataset, containing images of German road signs across 43 classes, poses challenges for both humans and models due to factors like perspective change, shade, color degradation, and lighting conditions. The dataset was also tested using the Belgian Traffic Signs [1] and Chinese Traffic Signs [2] datasets. The Belgium Traffic Signs dataset, with 62 classes, had 23 overlapping classes with GTSRB. The Chinese Traffic Signs dataset, with 58 classes, shared 15 classes with GTSRB. Pre-processing steps involved relabeling classes in the Belgium and Chinese datasets to match those in GTSRB and eliminating non-overlapping classes (see [98] for details).

We provide three models with the structure in Figures 1, 2, and 3. They contain QConv, Batch Normalization (BN), Max Pooling (ML), Fully Connected/Dense (D) layers. Note that the QConv layer binarizes the corresponding convolutional layer. All models were trained for 30 epochs. The model from Figure 1 was trained with images having the dimension 64px x 64 px, the one from Figure 2 with 48px x 48 px and the one from Figure 3 with 30px x 30 px. The two models involving Batch Normalization layers introduce real valued parameters besides the binary ones, while the third one contains only binary parameters (see Table 6) for statistics.

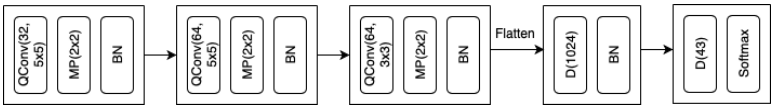


Figure 1: Accuracy Efficient Architecture for GTSRB and Belgium dataset

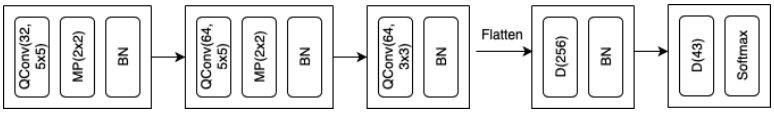


Figure 2: Accuracy Efficient Architecture for Chinese dataset

Specifications To evaluate the *adversarial robustness* of the networks above, we assessed perturbations within the infinity norm around zero, with the radius denoted as $\epsilon = \{1, 3, 5, 10, 15\}$. This involved randomly selecting three distinct images from the GTSRB dataset's test set for each model and generating VNNLIB files for each epsilon in the set. In total, we created

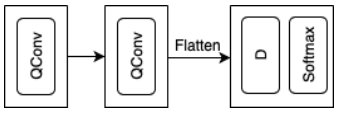


Figure 3: XNOR(QConv) architecture

Table 6: Training and Testing Statistics

Input size	Model name	Accuracy			#Params		
		German	China	Belgium	Binary	Real	Total
64px × 64px	Figure 1	96.45	81.50	88.17	1772896	2368	1775264
48px × 48px	Figure 2	95.28	83.90	87.78	904288	832	905120
30px × 30px	Figure 3	81.54	N/A	N/A	1005584	0	1005584

45 VNNLIB files. Due to a 6-hour total timeout constraint for solving all instances, each instance had a maximum timeout of 480 seconds. To review the generated VNNLIB specification files submitted to VNNCOMP 2023, as well as to generate new ones, please refer to https://github.com/apostovan21/vnncomp2023.

Link https://github.com/apostovan21/vnncomp2023

5.10 CIFAR100

Proposed by the α,β-CROWN team.

Motivation This benchmark is reused from VNN-COMP 2022 with a reduced complexity (only two out of the four models with medium sizes are retained). See details in Section 4.5 of the report of VNN-COMP 2022 [97].

Networks We provide two ResNet models on CIFAR-100 with different model widths and depths (input dimension $32 \times 32 \times 3$, 100 classes):

- `CIFAR100-ResNet-medium`: 8 residual blocks, 17 convolutional layers + 2 linear layers
- `CIFAR100-ResNet-large`: 8 residual blocks, 19 convolutional layers + 2 linear layers (almost identical to standard ResNet-18 architecture)

Specifications We randomly select 100 images from the CIFAR-100 test set with a verification timeout of 100 seconds for each of the two models. We filtered out the samples which can be verified by vanilla CROWN (which is used during training) to make the benchmark more challenging. The filtering process is done offline on a machine with a GPU due to the large sizes of these models. A small proportion of instances (around 18%) with adversarial examples have been retained for potentially identifying unsound results.

Link https://github.com/huanzhang12/vnncomp2024_cifar100_benchmark

5.11 TinyImagenet

Proposed by the α,β-CROWN team.

Motivation This benchmark is reused from VNN-COMP 2022. See details in Section 4.5 of the report of VNN-COMP 2022 [97].

Networks We provide a ResNet for TinyImageNet (input dimension $64 \times 64 \times 3$, 200 classes):

- `TinyImageNet-ResNet-medium`: 8 residual blocks, 17 convolutional layers + 2 linear layers

Specifications We randomly select 200 images from the TinyImageNet test set with a verification timeout of 100 seconds for each of the two models. A filtering procedure has been adopted similar to the CIFAR100 benchmark.

Link https://github.com/huanzhang12/vnncomp2024_tinyimagenet_benchmark

5.12 Yolo

Proposed by the α,β-CROWN team.

Motivation Object detection is central to many safety-critical applications, yet verification research has had limited benchmarks that capture its unique challenges. Even in a simplified form, YOLO highlights key aspects of detection tasks: multiple outputs, spatial reasoning over bounding boxes, and the need to ensure reliable perception under perturbations. A YOLO benchmark therefore provides a concrete step toward advancing verification methods for complex perception tasks such as object detection.

Networks The model is a modified version of YOLOv2. For simplicity of verification, the backbone of the original YOLOv2 model is replaced with a much smaller network. The network takes in an image ($3 \times 52 \times 52$) and outputs a tensor of a shape $125 \times 13 \times 13$, which contains the confidence scores, the classification result, and the positions of 5 bounding boxes for each of the 13×13 grid cells. The network was trained using adversarial training, incorporating an ℓ_1 regularization term in the loss.

Specifications Robustness properties are defined on the inputs and raw output tensors of the backbone network. For each instance, the property is verified if there is at least one bounding box successfully predicting the same object (with a confidence score greater than a preset threshold) given any bounded random perturbations on the input image.

Link https://github.com/xiangruzh/Yolo-Benchmark

5.13 SoundnessBench

Proposed by the α,β-CROWN team.

Motivation We introduce SoundnessBench, a novel benchmark designed to evaluate the soundness of neural network (NN) verifiers, inspired by the work [142]. While recent years have seen significant progress in developing both NN verifiers and benchmarks, existing benchmarks typically lack ground truth for challenging instances. As a result, it remains difficult to determine whether a verification claim is sound when no verifier can falsify the property under consideration.

Networks SoundnessBench includes a simple feedforward neural network and a residual network with minimal architectures and standard operators widely supported by mainstream verifiers. These operators include fully connected (linear) layers, 2D convolutional layers, ReLU activations, as well as reshaping and flattening operations between 2D and 1D formats.

Specifications The verification tasks are synthetic, with some specifications intentionally designed to embed counterexamples that are difficult for standard falsification methods—such as projected gradient descent (PGD)—to discover. Specifications are expressed as conjunctions of clauses.

Link https://github.com/Kevinyang555/SoundnessBench_vnncomp2026

5.14 Relusplitter

Proposed by Linhan Li and ThanhVu Nguyen (George Mason University)

Motivation Many existing DNN verification benchmarks are becoming ineffective at evaluating modern verifiers because their instances are often too easy or too hard and lack architectural diversity. To address these issues and allow for the reuse of established benchmarks, we propose Relusplitter [88]. It takes a DNN verification instance (network and property) and generates a semantically equivalent network on which the property is harder to verify. Relusplitter achieves this by systematically destabilizing stable neurons in the network.

Description This benchmark uses selected instances from benchmarks used in previous VNNCOMP iterations as seed inputs to generate more challenging instances. The networks include both fully connected (FC) and convolutional (Conv) architectures. All networks use a standard feed-forward structure. The timeout for the instances was reduced based on results from prior iterations, and the generated instances have 3x timeout. Benchmarks used as seed inputs include (1) ACAS Xu, (2) MNIST_FC, (3) Oval21, and (4) Cifar Biasfield.

Networks The seed instances use the original network, and the generated instances use a destabilized network generated from the original network.

Specifications The original specification from the seed instance was used for each generated instance.

Link https://github.com/dynaroars/relusplitter/tree/VNNCOMP-25

5.15 TLL Verify Bench

Proposed by James Ferlez (University of California, Irvine)

Motivation This benchmark consists of Two-Level Lattice (TLL) NNs, which have been shown to be amenable to fast verification algorithms (e.g. [52]). Thus, this benchmark was proposed as a means of comparing TLL-specific verification algorithms with general-purpose NN verification algorithms (i.e. algorithms that can verify arbitrary deep, fully-connected ReLU NNs).

Networks The networks in this benchmark are a subset of the ones used in [52, Experiment 3]. Each of these TLL NNs has $n = 2$ inputs and $m = 1$ output. The architecture of a TLL NN is further specified by two parameters: N, the number of local linear functions, and M, the number of selector sets. This benchmark contains TLLs of sizes $N = M = 8, 16, 24, 32, 40, 48, 56, 64$, with 30 randomly generated examples of each (the generation procedure is described in [52, Section 6.1.1]). At runtime, the specified verification timeout determines how many of these networks are included in the benchmark so as to achieve an overall 6-hour run time; this selection process is deterministic. Finally, a TLL NN has a natural representation using multiple computation paths [52, Figure 1], but many tools are only compatible with fully-connected networks. Hence, the ONNX models in this benchmark implement TLL NNs by "stacking" these computation paths to make a fully connected NN (leading to sparse weight matrices: i.e. with many zero weights and biases). The `TLLnet` class (https://github.com/jferlez/TLLnet) contains the code necessary to generate these implementations via the `exportONNX` method.

Specifications All specifications have as input constraints the hypercube $[-2, 2]^2$. Since all networks have only a single output, the output properties consist of a randomly generated real number and a randomly generated inequality direction. Random output samples from the network are used to roughly ensure that the real number property has an equal likelihood of being within the output range of the NN and being outside of it (either above or below all NN outputs on the input constraint set). The inequality direction is generated independently and

with each direction having an equal probability. This scheme biases the benchmark towards verification problems for which counterexamples exist.

Link https://github.com/jferlez/TLLVerifyBench

Commit 199d2c26d0ec456e62906366b694a875a21ff7ef

5.16 ACAS Xu

Networks The ACASXu benchmark consists of ten properties defined over 45 neural networks used to issue turn advisories to aircraft to avoid collisions. The neural networks have 300 neurons arranged in 6 layers, with ReLU activation functions. There are five inputs corresponding to the aircraft states, and five network outputs, where the minimum output is used as the turn advisory the system ultimately produces.

Specifications We use the original 10 properties [66], where properties 1-4 are checked on all 45 networks as was done in later work by the original authors [67]. Properties 5-10 are checked on a single network. The total number of benchmarks is therefore 186. The original verification times ranged from seconds to days—including some benchmark instances that did not finish. This year we used a timeout of around two minutes (116 seconds) for each property, in order to fit within a total maximum runtime of six hours.

5.17 Real-world distribution shifts

Proposed by the Marabou team.

Motivation While robustness against handcrafted perturbations (e.g., norm-bounded) for perception networks are more commonly investigated, robustness against real-world distribution shifts [130] are less studied but of practical interests. This benchmark set contains queries for verifying the latter type of robustness.

Networks The network is a concatenation of a generative model and a MNIST classifier. The generative model is trained to take in an unperturbed image and an embedding of a particular type of distribution shifts in latent space, and produce a perturbed image. The distribution shift captured in this case is the "shear" perturbation.

Specifications The verification task is to certify that a classifier correctly classifies all images in a perturbation set, which is a set of images generated by the generative model given a fixed image and a ball centering the mean perturbations on this image (in the latent space). This mean perturbation is computed by a prior network.

Link https://github.com/wu-haoze/dist-shift-vnn-comp

5.18 safeNLP

Proposed by Marco Casadio, Ekaterina Komendantskaya, Luca Arnaboldi, Tanvi Dinkar.

Motivation While considerable research has been dedicated to the verification of DNN-based systems in domains such as computer vision, there has been a notable lack of focus on the verification of natural language processing (NLP) systems. This is particularly critical given the rise of conversational agents across various domains, where inaccurate or misleading responses can cause real-world harm. For example, recent EU legislation [82] requires chatbots to disclose their non-human nature when queried, and developers of the chatbots should provide firm, and if possible, formal, guarantees that such disclosure will be given in an accurate manner. Medical assistants give another example where formal guarantees about the conversational

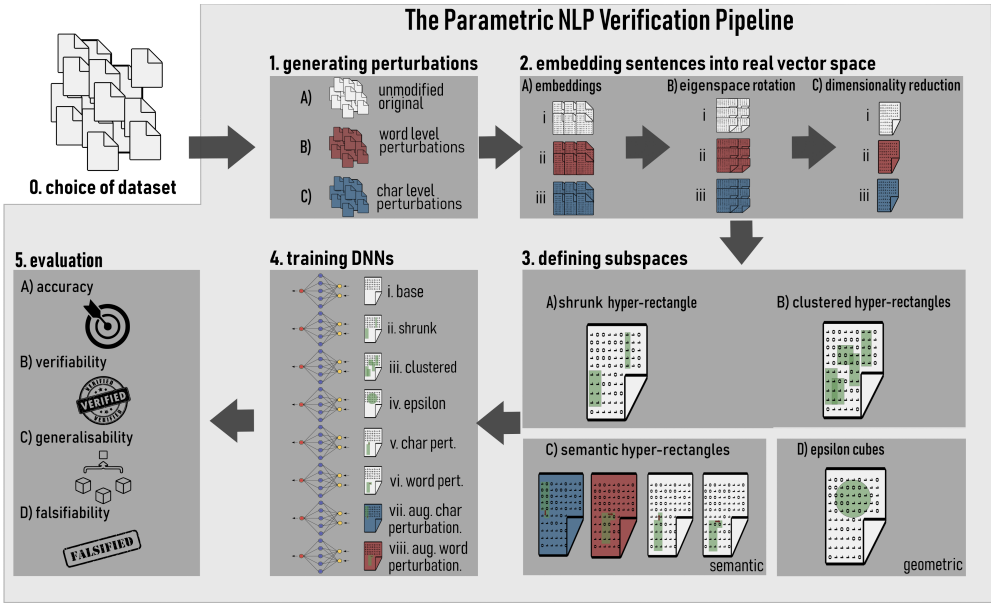


Figure 4: *Generic approach to generating the NLP verification pipelines [27, 28] deployed to obtain the safeNLP benchmark.*

agent responses are needed in order to safeguard against chatbots generating harmful medical advice [20]. While some initial work has been done in this area of NLP verification [64, 61, 128, 140, 127, 77, 37, 108, 21], no agreement on commonly accepted benchmarks has been reached in this domain. To address this gap, we introduce safeNLP, the first such benchmark.

Application In [28], we have undertaken a large-scale study of the existing literature on NLP verification, and distilled common patterns among the existing approaches. Usually, given a dataset consisting of sentences divided into classes, Large Language Models (LLMs) are used to embed these sentences into real-vector spaces, after which smaller neural networks are trained to classify the embedded vectors (relative to the originally given classes). For verification, one can generate meaning-preserving sentence perturbations, again embed them into vector spaces, and verify that subspaces that contain the (embeddings of) the perturbed sentences are classified correctly. Also, in line with classical verification pipelines [29], one can use these input subspaces to train the neural network to be robust on them. The problem was that each of the existing approaches [64, 61, 128, 140, 127, 77, 37, 108, 21] used parts of this pipeline in different ways, which made it difficult to compare or audit the results. In [27, 28], we made a generic implementation of this pipeline, where each of the components of the pipeline is implemented in a modular and transparent way. For example, we can choose and vary embedding functions, training modes, algorithms for sentence perturbations and algorithms for robust training, independently and modularly; as shown in Figure 4. This implementation was used to generate the presented VNNCOMP benchmark.

- *Datasets:* Although there was no clear consensus in [64, 61, 128, 140, 127, 77, 37, 108, 21], the most frequently used dataset in prior works was the IMDB dataset containing film reviews. Its disadvantage is unclear relation to safety critical domains that usually motivate verification efforts. On the other hand, none of the previously used datasets concerned safety-critical applications of NLP. We decided to address this problem, and

therefore applied our generic NLP verification pipeline on two safety-critical datasets: R-U-A-Robot [55], which focuses on the chatbot disclosure problem, and Medical [9], which addresses the issue of harmful advice provided by medical chatbots. Both datasets are pre-processed into two classes, positive and negative, to simplify the verification task. For further details on the pre-processing steps and datasets, see [28] and the benchmark GitHub repository.

- *Input Space:* In both datasets, sentences are transformed into fixed-size vector representations, i.e. embeddings, which serve as the inputs to the neural networks. For this VNNCOMP benchmark, we used Sentence-BERT [99].

- *What to Verify:* For each dataset, we generated meaning-preseving sentence perturbations at character and word level as in Moradi et al. [96] and at sentence level with Vicuna [31]. For each positive sentence in the dataset, the smallest hypercube containing the embeddings of all of its obtained perturbations formed one input subspace for verification. Such subspaces were obtained for all positive sentences from the given data set, and were subject to VNCCOMP verification challenge.

- *A note on broader impact:* Verified models can serve as filters for larger NLP systems: e.g. to screen inputs to ensure they meet safety criteria before being passed on to more complex models.

Networks The safeNLP benchmark includes two neural networks, each corresponding to a different dataset (R-U-A-Robot and Medical). Both networks share the same architecture, consisting of two fully-connected layers. The hidden layer has 128 units with a ReLU activation function, while the output layer has 2 units representing the two classification classes (positive/negative). To enhance the robustness of the networks to the specified safety requirements, they are trained using a custom PGD (Projected Gradient Descent) [94] adversarial training technique. In particular, the PGD attack explores the above-mentioned subspaces of the input space (cf. also Figure 4).

Specifications The benchmark uses hyper-rectangles in the 30-dimensional embedding space as the subspaces of choice, offering a computationally efficient way to define more precise and adaptable regions compared to the traditional ϵ-cubes. The specifications require verifying that, for a given network and hyper-rectangle, every point within the hyper-rectangle is classified as the positive class by the network. To meet time constraints, we randomly select 1,080 such specifications, each linked to one of the two networks and a corresponding hyper-rectangle, with a timeout of 20 seconds per specification.

Link `https://github.com/ANTONIONLP/safeNLP`

5.19 CORA Benchmark

Proposed by the CORA team.

Motivation The verification of neural networks can be quite slow, i.e., the verification of a single instance can take multiple days – which is often hard to justify, particularly in safety-critical scenarios. To encourage the fast verification of neural networks, our benchmark focuses on the verification time by setting a small timeout and testing three different (adversarial) training techniques that aim to ease the verifiability.

Networks The benchmark consists of one ReLU-neural network architecture (7x250 + ReLU), which was trained on three datasets, (MNIST, SVHN, and CIFAR10), using three different (adversarial) training methods, i.e., standard (point), interval-bound propagation, and set-based. Both interval-bound propagation and set-based training are training methods that improve the robustness of the trained neural network and aim to ease later verification. The neural networks are taken from the first evaluation run of [79]; please refer to [79] for the training details.

Specifications All networks are trained on classification tasks. The goal is to verify that no image within a given input set is incorrectly classified.

Link https://github.com/kollerlukas/cora-vnncomp2024-benchmark

5.20 SAT ReLU

Proposed by Edoardo Manino (The University of Manchester)

Motivation Neural network verifiers are fundamentally not different from any other piece of software in that they may contain bugs. As such, it is necessary to test their behavior for correctness. To this end, the SAT ReLU benchmark is constructed with the additional requirement of having its verification verdicts (safe or unsafe) known a priori. With it, we can test all neural network verifiers for correctness.

Description The SAT ReLU benchmark is entirely synthetic. Each instance is built by generating a random 3-SAT boolean formula with known satisfiability verdict. In total, we generate 50 satisfiable formulae and 50 unsatisfiable ones in CNF format. We vary the number of variables in $v = [2, 100]$ and the number of clauses in $c = [v, 5v]$. Then, we encode the formulae as neural network verification problems.

Networks We encode each CNF formula as a fully-connected ReLU network with one hidden layer. To do so, we take inspiration from the ReLU gadgets introduced by [66]. First, we assume that each element of the input $x \in \mathbb{R}^v$ represents a boolean variable $x_i \in \{0, 1\}$. Half of the network encodes the boolean arithmetic necessary to compute the CNF formula under this assumption. Second, we let each variable vary in $x_i \in [0, 1]$ and use the other half of the network to encode the necessary binarization constraints. Finally, we merge the two halves into a single network. The final network has v inputs, $c + 2v$ hidden activations, and 2 outputs.

Specifications Given the nature of the networks we construct, the original CNF formula is satisfiable if and only if there exists some input $x \in \{0, 1\}^n$ that produces an output of $y_1 \geq 1$. Non-binary inputs cause the second output to be positive, and thus are rejected by setting a binarization constraint of $y_2 \leq 0$.

Link https://github.com/emanino/neurocodebench

5.21 MetaRoom

Proposed by Hanjiang Hu (CMU), Zuxin Liu (CMU), Linyi Li (UIUC), Jiacheng Zhu (CMU), Ding Zhao (CMU).

Motivation MetaRoom Benchmark is based on the MetaRoom dataset, which aims at the robustness certification and verification of deep learning based vision models against camera motion perturbation in the indoor robotics application. Specifically, this benchmark focuses on the classification of 20 labels against camera moves within tiny perturbation radii of translation along the z-axis and rotation along the y-axis (e.g. 1e-5 m, 2.5e-4 degree). The MetaRoom dataset is a realistic indoor object recognition dataset with dense point cloud maps, which

enables image projections from different camera poses and simulates object-centric semantic robustness in real-world robotic applications. More details about the dataset can be found in [59].

Networks The models of `cnn_4layer` and `cnn_6layer` are 4-layer and 6-layer convolutional neural networks with a last layer of a fully connected layer for multi-class classification. The input shape is `1*3*32*56`, which is projected from one-dimensional relative camera rotation or translation around 0 (e.g. [-1e-5, 1e-5]) from a very dense point cloud based on direct Z-buffering. And the output is for the classification of 20 labels. The pretrained models give correct predictions at camera motion movement origins.

Specifications Simplified from the 1-dim semantic perturbation studied in [58, 60], the benchmark for VNN-COMP adopts the pre-projected image specifications from a very dense point cloud, where the lower and upper bounds are all pixels of the image during the projection within the camera perturbation radius of translation along the z-axis or rotation along the y-axis. The output specifications will be the classification labels at camera movement origins.

Link https://github.com/HanjiangHu/metaroom_vnn_comp2023

5.22 cersyve

Proposed by Yujie Yang (THU, CMU), Hanjiang Hu (CMU), Tianhao Wei (CMU), Shengbo Eben Li (THU), Changliu Liu (CMU).

Motivation Neural safety certificate verification is a special type of verification problems that require neural networks to satisfy certain properties everywhere in the state space, i.e., the input set of the verification problem is the entire state space. This is different from most existing benchmarks, which only consider verification in either a small disturbance set around data samples or part of the state space, such as MNIST, CIFAR, and ACAS Xu. Another distinct feature of safety certificate verification is that it not only involves a single safety certificate network but also needs system dynamics and control policies for verification, and certain conversions are required before these components can be formulated as a standard verification problem.

Description While this version of cersyve only contains necessary networks and specifications for verification, our full version also includes a set of neural safety certificate synthesis tools, including pre-training, adversarial training, and verification-guided training modules, as well as evaluation tools for synthesized certificates. For a detailed description of cersyve, please refer to our paper [134].

Networks The cersyve benchmark contains nine commonly used control tasks with state dimensions ranging from two to six. These tasks include both linear and nonlinear dynamics and safety constraints. We provide two ONNX models for each task. One is a pre-trained safety certificate, and the other is fine-tuned. The models are already integrated with all necessary elements for verification, such as system dynamics, constraints, and control policies. Users can view each of them as a single neural network for standard verification.

Specifications The cersyve benchmark requires to verify that within a bounded state space, whether the constraint satisfaction and forward invariance properties of a neural safety certificate is satisfied for all states. For a detailed description of the verification problem formulation, please refer to our paper [134]. The input specifications are lower and upper bounds on each dimension of the state. The output specifications are always two inequalities corresponding to the two properties.

Link https://github.com/intelligent-control-lab/cersyve.jl/tree/VNN-COMP-2025

Table 7: Performance and complete-verification difficulty of the models underlying the Challenging Certified Training benchmark. Verification results were obtained with α, β-CROWN using a 1,000-second cutoff on 10,000 test-set properties per model.

Dataset / ϵ	Network	Standard acc.	Certified acc.	Timeouts
CIFAR-10, 2/255	CNN-7	83.54%	66.04%	658 (6.58%)
CIFAR-10, 2/255	Wide CNN-7	85.37%	60.28%	1,433 (14.33%)
CIFAR-10, 8/255	CNN-7	57.19%	35.49%	134 (1.34%)
CIFAR-10, 8/255	Wide CNN-7	57.74%	34.60%	132 (1.32%)
TinyImageNet, 1/255	CNN-7	41.21%	27.81%	236 (2.36%)
TinyImageNet, 1/255	Wide CNN-7	41.89%	28.35%	401 (4.01%)
			Total timeouts	2,994 (4.99%)

5.23 Challenging Certified Training

Proposed by Konstantin Kaulen (RWTH Aachen University)

Motivation Using recent advances in certified training, we obtained state-of-the-art certifiably robust image classifiers using the CTRAIN library for certified training [69, 73]. Their standard and certified accuracies are summarized in Table 7. Despite this progress, we observed that complete verification of these models is highly computationally demanding. When evaluating all test-set properties using α, β-CROWN with a cutoff of 1,000 seconds, 2,994 out of 60,000 verification tasks timed out, with a timeout rate of up to 14.33%. Thus, complete verification is becoming a major computational bottleneck for further progress in certifiably robust neural networks: improvements in certified training performance are of limited practical value if the resulting guarantees cannot be established within reasonable computational budgets. The Challenging Certified Training benchmark therefore provides difficult and practically relevant instances for measuring progress in complete neural network verification.

Description The benchmark contains 60 local-robustness instances derived from the six models shown in Table 7. To obtain instances spanning a broad range of verification difficulty, all 10,000 test-set properties for each model were first evaluated using α, β-CROWN with its standard configuration and a cutoff time of 1,000 seconds. The resulting instances were stratified according to their observed verification runtime into four categories: $[0, 10]$ seconds, $[10, 100]$ seconds, $[100, 1000]$ seconds, and timeouts. For each model, we sample two instances from each of the first two categories and three instances from each of the latter two categories, yielding ten properties per model and 60 benchmark instances overall. This construction combines moderately difficult properties with instances that remain unsolved by a state-of-the-art verifier within a substantial computational budget.

Networks The benchmark comprises six convolutional neural networks trained using MTL-IBP [34]. For CIFAR-10, it contains CNN-7 architectures for ℓ_∞ perturbation radii of $\epsilon = 2/255$ and $\epsilon = 8/255$. For TinyImageNet, it contains corresponding standard and width-scaled CNN-7 architectures for $\epsilon = 1/255$. Their standard and certified accuracies are reported in Table 7.

Specifications Each specification encodes standard ℓ_∞ local robustness of a CIFAR-10 or TinyImageNet test image at the perturbation radius corresponding to the respective model.

Link https://github.com/kkaulen/vnncomp_challenging_certified_training

5.24 Additional Benchmarks

We have not yet obtained benchmark descriptions for other benchmark sets reported in Table 4. We will update the report when these descriptions are available. Artifacts of the benchmarks are available in the repository[6].

[6] https://github.com/VNN-COMP/vnncomp2026_benchmarks

6 Results

Each tool was run on each of the benchmarks and produced a `csv` result file, that was provided as feedback to the tool authors using the online execution platform. The final `csv` files for each tool as well as scoring scripts are available online: https://github.com/VNN-COMP/vnncomp2026_results. The results were automatically analyzed to compute scores and create the statistics presented in this section, where a tool is omitted from individual benchmark results if it timed out on all instances.

6.1 Regular Track

The regular track contained all the benchmarks that were voted for by at least half of all participants.

Table 8: Overall Score

#	Tool	Score
1	α-β-CROWN	2344.0
2	Vibecheck	2278.6
3	PyRAT	1813.6
4	NeuralSAT	1725.5
5	NNV	1149.5
6	CORA	1055.5
7	Bright	1000.5
8	N2v	984.5
9	SuperSimple	665.3
10	Act	650.3
11	nnenum	489.3
12	SobolBox	450.8
13	Agate	0

6.2 Extended Track

All benchmarks that were voted for by at least one team and did not make it into the regular track were part of the extended track. Every benchmark was voted for at least once, so no benchmark was unscored.

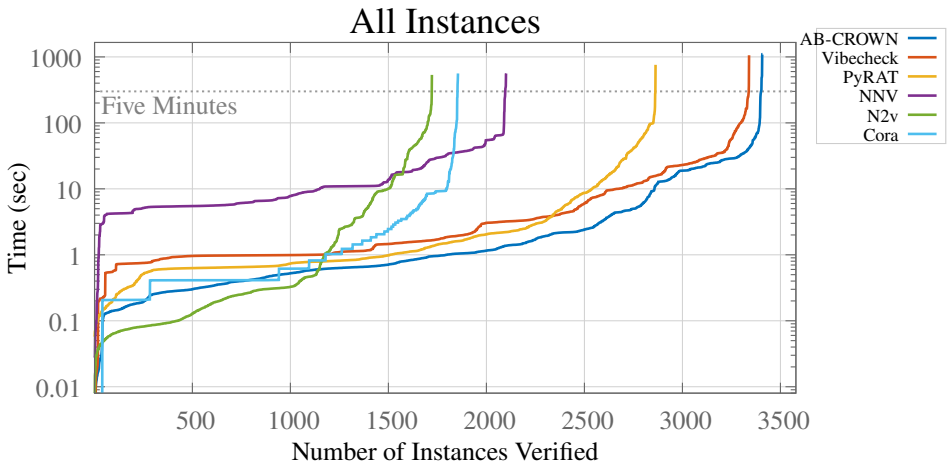


Figure 5: Cactus Plot for All Instances.

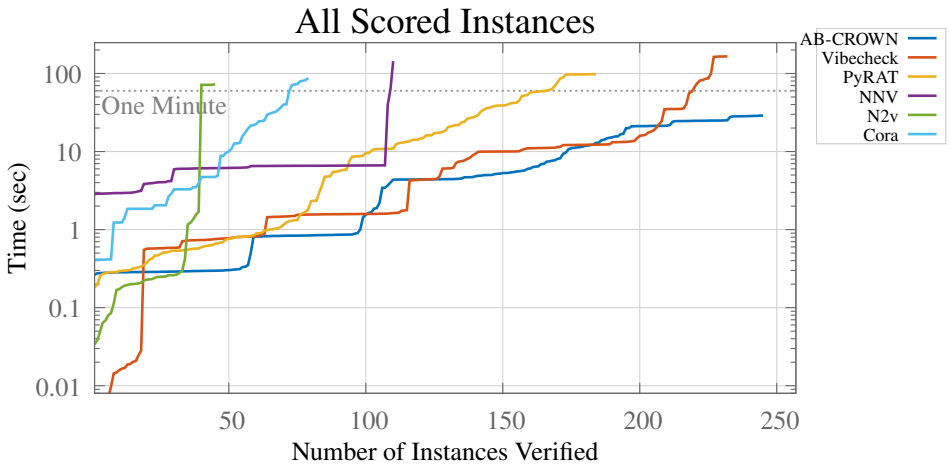


Figure 6: Cactus Plot for All Scored Instances.

Table 9: Overall Score

#	Tool	Score
1	α-β-CROWN	600.0
2	Vibecheck	574.0
3	PyRAT	478.0
4	NNV	271.3
5	N2v	178.0
6	CORA	158.0

6.3 Other Stats

This section presents other statistics related to the measurements that are interesting but did not play a direct role in scoring this year. The results reflect the tool performance on the regular track.

Table 10: Overhead

#	**Tool**	**Seconds**
1	nnenum	0.9
2	CORA	1.0
3	Vibecheck	1.7
4	Agate	2.7
5	Bright	2.9
6	NeuralSAT	3.2
7	SuperSimple	3.6
8	N2v	4.1
9	α-β-CROWN	5.6
10	SobolBox	7.4
11	PyRAT	7.5
12	NNV	8.2
13	Act	10.9

Table 11: Num Benchmarks Participated

#	**Tool**	**Count**
1	Vibecheck	25
2	PyRAT	24
3	α-β-CROWN	24
4	NeuralSAT	22
5	N2v	21
6	NNV	19
7	Agate	18
8	SuperSimple	17
9	nnenum	13
10	CORA	13
11	Act	12
12	SobolBox	11
13	Bright	11

Table 12: Num Instances Verified

#	Tool	Count
1	α-β-CROWN	3164
2	Vibecheck	3108
3	PyRAT	2679
4	NeuralSAT	2637
5	Bright	2048
6	NNV	1991
7	CORA	1776
8	N2v	1677
9	Act	1558
10	SuperSimple	1551
11	nnenum	1378
12	SobolBox	559
13	Agate	254

Table 13: Num SAT

#	Tool	Count
1	α-β-CROWN	1182
2	Vibecheck	1161
3	PyRAT	1093
4	N2v	1045
5	Bright	1022
6	SuperSimple	1007
7	NeuralSAT	998
8	NNV	963
9	CORA	898
10	Act	759
11	nnenum	695
12	SobolBox	355

Table 14: Num UNSAT

#	**Tool**	**Count**
1	α-β-CROWN	1982
2	Vibecheck	1947
3	NeuralSAT	1639
4	PyRAT	1586
5	NNV	1028
6	Bright	1026
7	CORA	878
8	Act	799
9	nnenum	683
10	N2v	632
11	SuperSimple	544
12	Agate	254
13	SobolBox	204

Table 15: Incorrect Results (or Missing CE)

#	**Tool**	**Count**
1	Agate	955
2	NeuralSAT	94
3	nnenum	58
4	SuperSimple	14
5	Act	10
6	SobolBox	2
7	CORA	1
8	α-β-CROWN	1

7 Conclusion and Ideas for Future Competitions

This report summarizes the 7$^{\text{th}}$ Verification of Neural Networks Competition (VNN-COMP), held in 2026. As per last year, the best-performing tools are GPU-enabled linear bound propagation methods using a branch-and-bound framework. The new VNNLIB 2.0 input format was widely adopted by tool proposers, which sends a positive signal. It shows that the community is eager to extend the reach of verification to more complex properties; we hope this will encourage difficult benchmarks propositions for the next iteration.

VNN-COMP 2026 successfully implemented a range of improvement opportunities identified during the previous iteration. These included requiring witnesses of found counter-examples to disambiguate tool disagreement, increasing automatization to enable a smoother final evaluation, and making a broader range of AWS instances available to allow for a better fit with tools' requirements. Additionally, we introduced the Competition Contribution papers included in the SAIV proceedings [6] for participants to summarize their approaches. In addition, in cases where the answer to a benchmark is known a priori, we will explore using the known correct results as the ground truth. Further ideas for future competitions include the use of scored benchmarks specifically designed for year-on-year progress tracking, the reduction of tool tuning, a batch-processing mode, and more rigorous soundness evaluation. Finally, as research on proof generation for neural network verification grows [63, 51, 44], a longer term goal is to require solvers to produce UNSAT proofs.

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A Benchmark Results

In this section, we provide more fine-grained results.

A.1 Regular Track

Table 16: Benchmark `2026-acasxu-2023`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	139	47	0	0	1860	100.0	100.0%
2	PyRAT	139	47	0	0	1860	100.0	100.0%
3	α-β-CROWN	139	47	0	0	1860	100.0	100.0%
4	CORA	137	47	0	0	1840	98.9	98.9%
5	NeuralSAT	139	44	0	0	1830	98.4	98.4%
6	Bright	133	46	0	0	1790	96.2	96.2%
7	NNV	130	47	0	0	1770	95.2	95.2%
8	nnenum	139	44	0	1	1680	90.3	98.4%
9	SobolBox	115	42	0	0	1570	84.4	84.4%
10	Act	132	46	0	3	1330	71.5	95.7%
11	N2v	80	38	0	0	1180	63.4	63.4%
12	SuperSimple	54	38	0	0	920	49.5	49.5%
13	Agate	85	0	0	46	-6050	0	45.7%

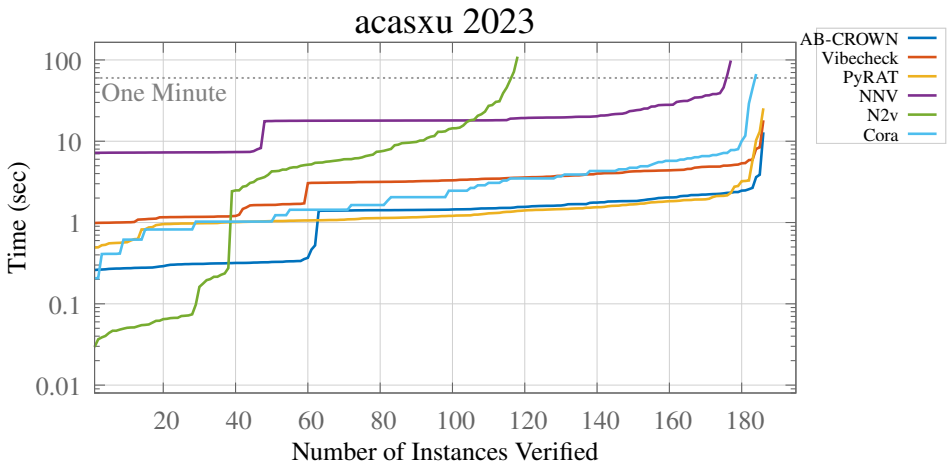


Figure 7: Cactus Plot for acasxu 2023.

Table 17: Benchmark `2026-cersyve`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	6	6	0	0	120	100.0	100.0%
2	NeuralSAT	6	6	0	0	120	100.0	100.0%
3	α-β-CROWN	6	6	0	0	120	100.0	100.0%
4	PyRAT	5	6	0	0	110	91.7	91.7%
5	CORA	5	6	0	0	110	91.7	91.7%
6	Act	3	6	0	0	90	75.0	75.0%
7	SuperSimple	0	6	0	0	60	50.0	50.0%
8	SobolBox	0	6	0	0	60	50.0	50.0%
9	N2v	0	6	0	0	60	50.0	50.0%
10	NNV	1	4	0	0	50	41.7	41.7%
11	nnenum	0	3	0	1	-120	0	25.0%
12	Agate	0	0	0	6	-900	0	0.0%

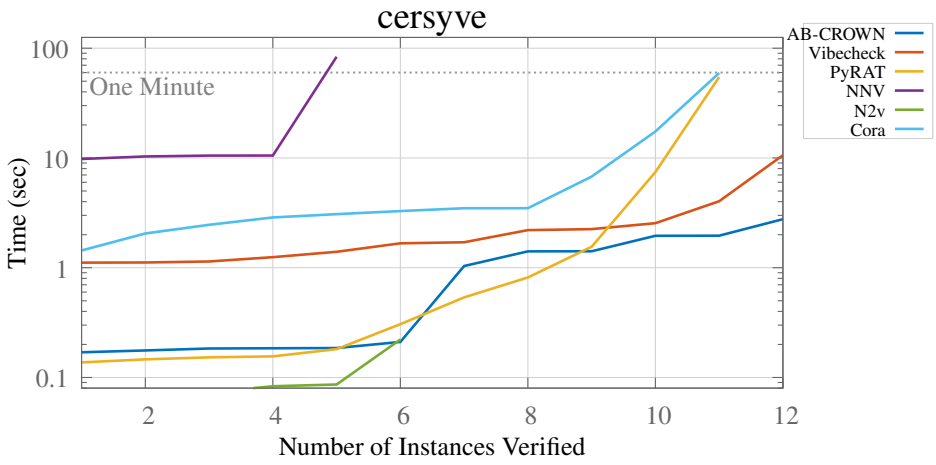


Figure 8: Cactus Plot for cersyve.

Table 18: Benchmark `2026-cgan2026`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	8	12	0	0	200	100.0	95.2%
2	α-β-CROWN	8	12	0	0	200	100.0	95.2%
3	PyRAT	8	11	0	0	190	95.0	90.5%
4	NeuralSAT	4	12	0	0	160	80.0	76.2%
5	NNV	0	11	0	0	110	55.0	52.4%
6	CORA	0	7	0	0	70	35.0	33.3%
7	N2v	0	6	0	0	60	30.0	28.6%
8	nnenum	0	1	0	0	10	5.0	4.8%
9	SobolBox	9	10	0	2	-110	0	90.5%
10	Agate	0	0	0	18	-2700	0	0.0%

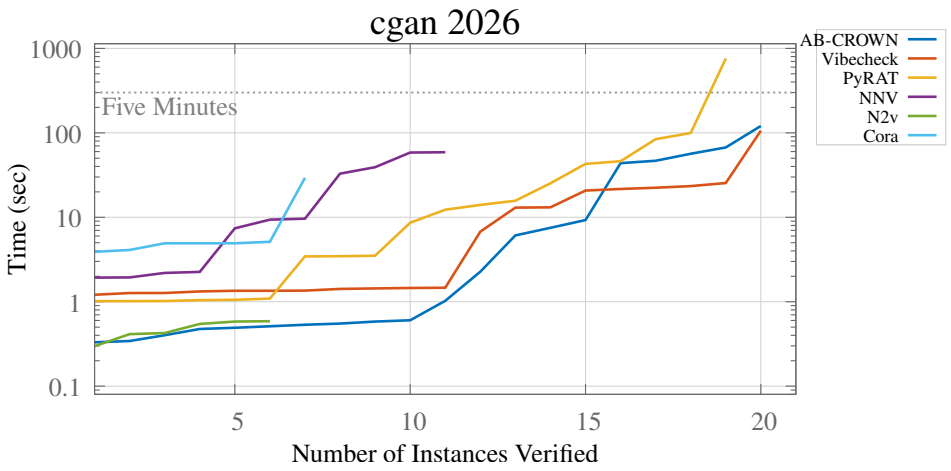


Figure 9: Cactus Plot for cgan 2026.

Table 19: Benchmark `2026-challenging-certified-training-2026`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	α-β-CROWN	27	11	0	0	380	100.0	63.3%
2	Vibecheck	22	11	0	0	330	86.8	55.0%
3	NeuralSAT	16	4	0	0	200	52.6	33.3%
4	PyRAT	6	10	0	0	160	42.1	26.7%
5	SuperSimple	0	11	0	0	110	28.9	18.3%
6	N2v	0	4	0	0	40	10.5	6.7%
7	NNV	0	3	0	0	30	7.9	5.0%
8	Agate	0	0	0	3	-450	0	0.0%

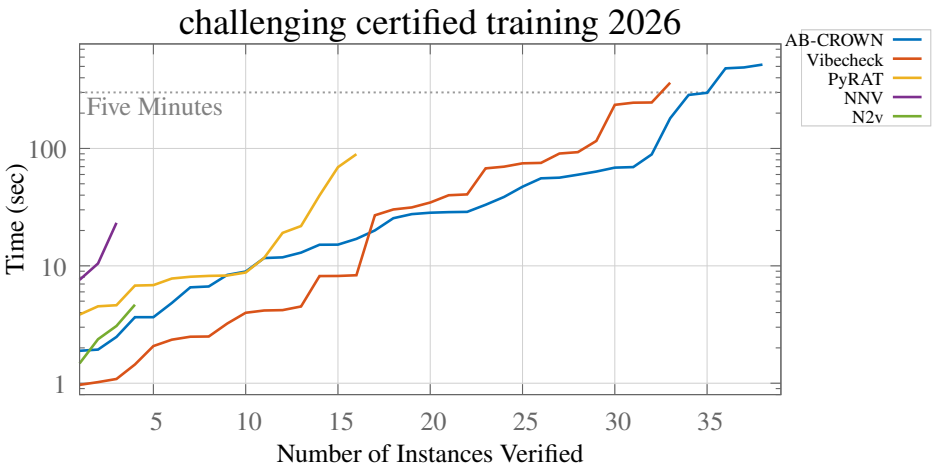


Figure 10: Cactus Plot for challenging certified training 2026.

Table 20: Benchmark `2026-cifar100-2024`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	α-β-CROWN	127	33	0	0	1600	100.0	80.0%
2	Vibecheck	125	33	0	0	1580	98.8	79.0%
3	NeuralSAT	104	33	0	0	1370	85.6	68.5%
4	Bright	89	33	0	0	1220	76.2	61.0%
5	PyRAT	88	31	0	0	1190	74.4	59.5%
6	NNV	93	12	0	0	1050	65.6	52.5%
7	Act	35	14	0	0	490	30.6	24.5%
8	SuperSimple	0	33	0	0	330	20.6	16.5%
9	N2v	0	32	0	0	320	20.0	16.0%

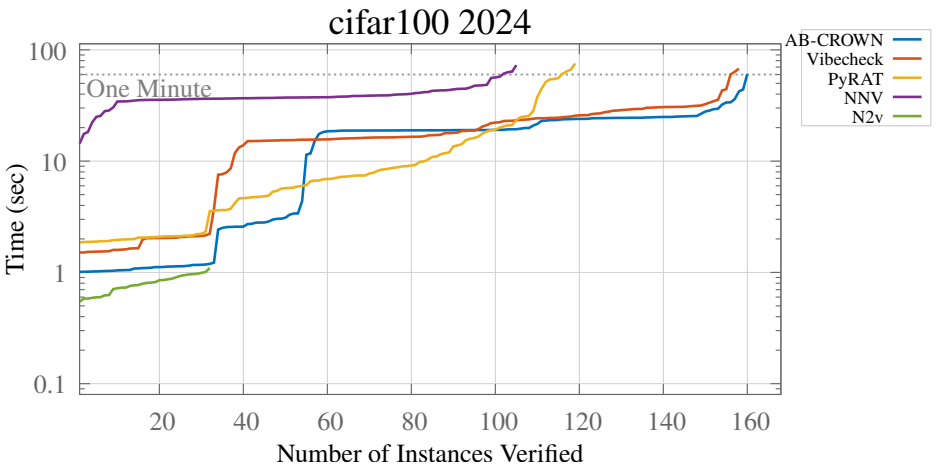


Figure 11: Cactus Plot for cifar100 2024.

Table 21: Benchmark `2026-collins-rul-cnn-2022`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	nnenum	45	17	0	0	620	100.0	100.0%
2	Vibecheck	45	17	0	0	620	100.0	100.0%
3	PyRAT	45	17	0	0	620	100.0	100.0%
4	NeuralSAT	45	17	0	0	620	100.0	100.0%
5	NNV	45	17	0	0	620	100.0	100.0%
6	N2v	45	17	0	0	620	100.0	100.0%
7	α-β-CROWN	45	17	0	0	620	100.0	100.0%
8	CORA	45	0	0	0	450	72.6	72.6%
9	SobolBox	1	17	0	0	180	29.0	29.0%
10	Agate	0	0	0	17	-2550	0	0.0%

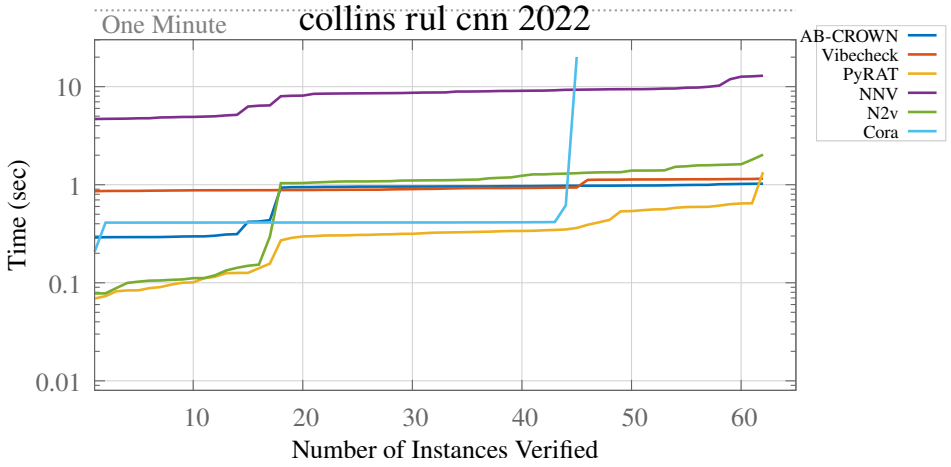


Figure 12: Cactus Plot for collins rul cnn 2022.

Table 22: Benchmark `2026-cora-2024`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	25	127	0	0	1520	100.0	84.4%
2	α-β-CROWN	25	127	0	0	1520	100.0	84.4%
3	NeuralSAT	24	127	0	0	1510	99.3	83.9%
4	PyRAT	24	126	0	0	1500	98.7	83.3%
5	Bright	23	126	0	0	1490	98.0	82.8%
6	SuperSimple	21	126	0	0	1470	96.7	81.7%
7	N2v	19	126	0	0	1450	95.4	80.6%
8	CORA	21	119	0	0	1400	92.1	77.8%
9	NNV	0	104	0	0	1040	68.4	57.8%
10	nnenum	21	1	0	0	220	14.5	12.2%
11	Act	2	4	0	0	60	3.9	3.3%
12	Agate	0	0	0	89	-13350	0	0.0%

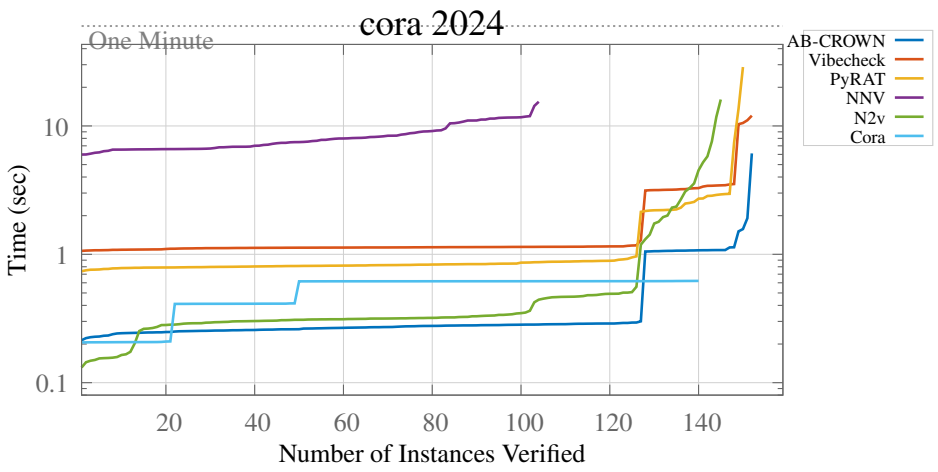


Figure 13: Cactus Plot for cora 2024.

Table 23: Benchmark `2026-dist-shift-2023`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	64	8	0	0	720	100.0	100.0%
2	PyRAT	64	8	0	0	720	100.0	100.0%
3	NeuralSAT	64	8	0	0	720	100.0	100.0%
4	N2v	64	8	0	0	720	100.0	100.0%
5	CORA	64	8	0	0	720	100.0	100.0%
6	α-β-CROWN	64	8	0	0	720	100.0	100.0%
7	SuperSimple	53	8	0	0	610	84.7	84.7%
8	NNV	49	8	0	0	570	79.2	79.2%
9	SobolBox	0	8	0	0	80	11.1	11.1%
10	Act	64	1	0	7	-400	0	90.3%
11	Agate	0	0	0	8	-1200	0	0.0%

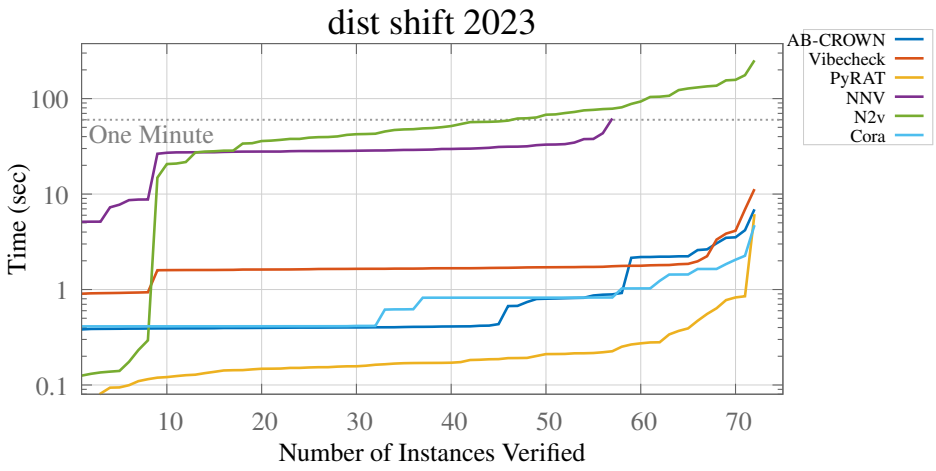


Figure 14: Cactus Plot for dist shift 2023.

Table 24: Benchmark `2026-linearizenn-2024`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	nnenum	59	1	0	0	600	100.0	100.0%
2	Vibecheck	59	1	0	0	600	100.0	100.0%
3	SobolBox	59	1	0	0	600	100.0	100.0%
4	PyRAT	59	1	0	0	600	100.0	100.0%
5	NeuralSAT	59	1	0	0	600	100.0	100.0%
6	NNV	59	1	0	0	600	100.0	100.0%
7	CORA	59	1	0	0	600	100.0	100.0%
8	Bright	59	1	0	0	600	100.0	100.0%
9	α-β-CROWN	59	1	0	0	600	100.0	100.0%
10	N2v	53	1	0	0	540	90.0	90.0%
11	SuperSimple	14	1	0	0	150	25.0	25.0%
12	Agate	0	0	0	1	-150	0	0.0%

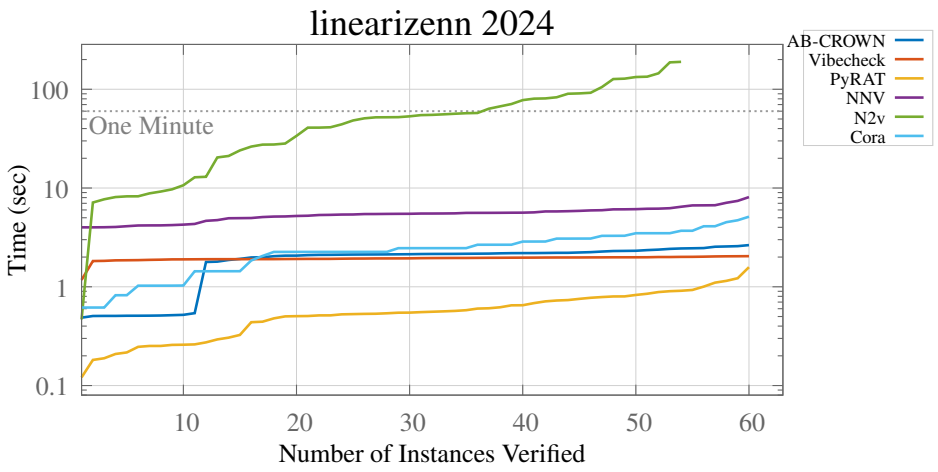


Figure 15: Cactus Plot for linearizenn 2024.

Table 25: Benchmark `2026-lsnc-relu`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	68	12	0	0	800	100.0	100.0%
2	α-β-CROWN	68	12	0	0	800	100.0	100.0%
3	NNV	0	9	0	0	90	11.2	11.2%
4	PyRAT	0	8	0	0	80	10.0	10.0%
5	Agate	0	0	0	8	-1200	0	0.0%

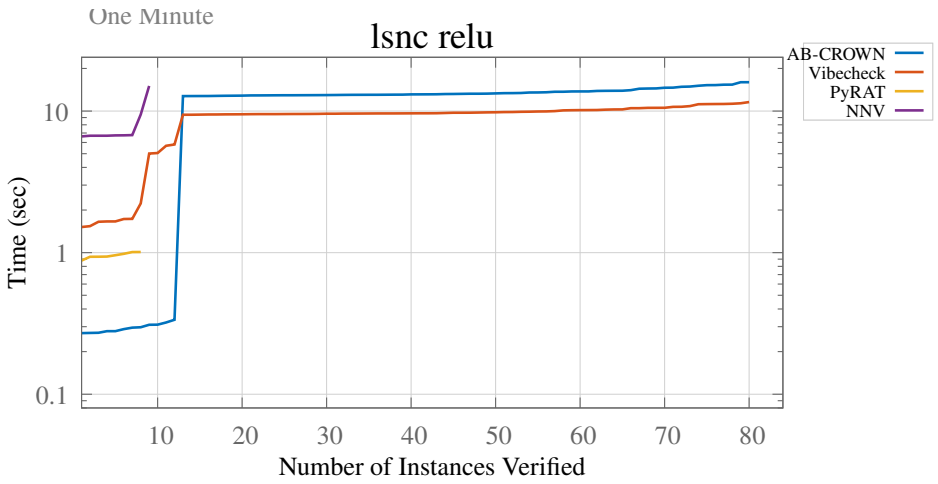


Figure 16: Cactus Plot for lsnc relu.

Table 26: Benchmark `2026-malbeware`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	α-β-CROWN	121	29	0	0	1500	100.0	100.0%
2	SuperSimple	120	29	0	0	1490	99.3	99.3%
3	NeuralSAT	120	29	0	0	1490	99.3	99.3%
4	Bright	120	29	0	0	1490	99.3	99.3%
5	Vibecheck	121	27	0	0	1480	98.7	98.7%
6	Act	120	28	0	0	1480	98.7	98.7%
7	PyRAT	118	28	0	0	1460	97.3	97.3%
8	NNV	119	17	0	0	1360	90.7	90.7%
9	CORA	116	10	0	0	1260	84.0	84.0%
10	N2v	40	20	0	0	600	40.0	40.0%
11	nnenum	79	8	0	2	570	38.0	58.0%
12	Agate	0	0	0	6	-900	0	0.0%

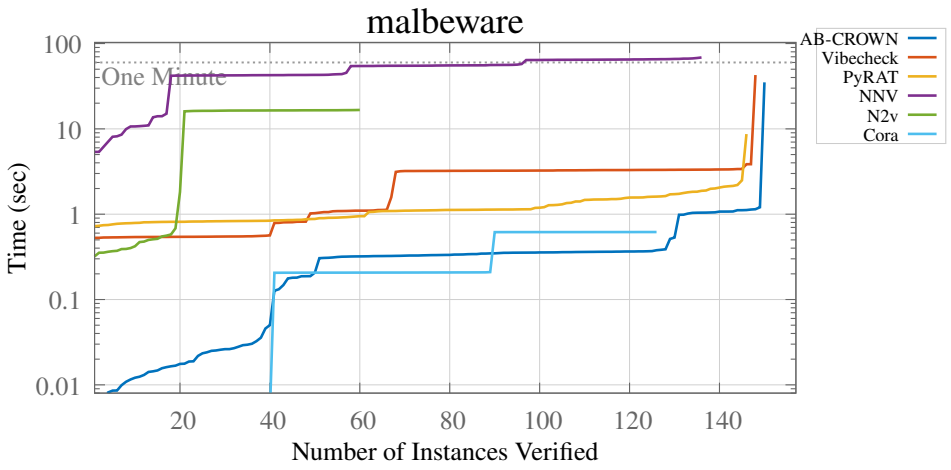


Figure 17: Cactus Plot for malbeware.

Table 27: Benchmark `2026-metaroom-2023`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	93	6	0	0	990	100.0	99.0%
2	Bright	93	6	0	0	990	100.0	99.0%
3	α-β-CROWN	93	6	0	0	990	100.0	99.0%
4	PyRAT	93	5	0	0	980	99.0	98.0%
5	NeuralSAT	92	6	0	0	980	99.0	98.0%
6	NNV	92	4	0	0	960	97.0	96.0%
7	N2v	91	5	0	0	960	97.0	96.0%
8	CORA	90	0	0	0	900	90.9	90.0%
9	nnenum	50	2	0	0	520	52.5	52.0%
10	SobolBox	0	4	0	0	40	4.0	4.0%
11	Agate	0	0	0	4	-600	0	0.0%

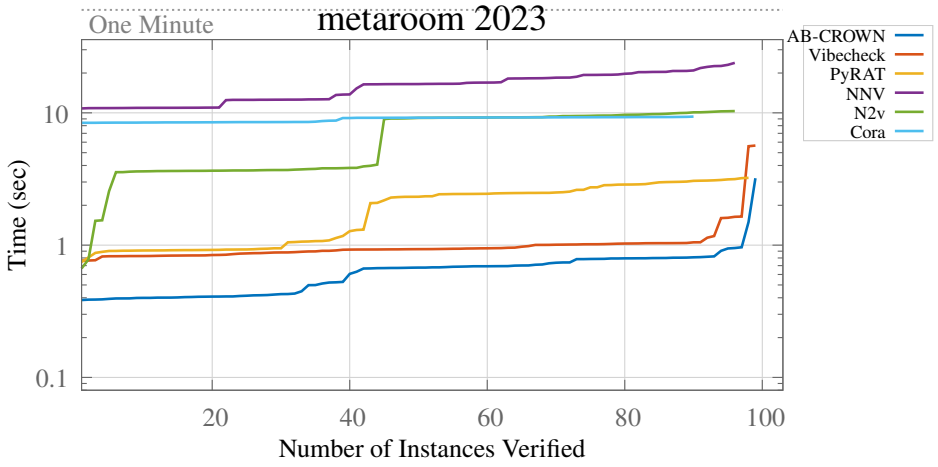


Figure 18: Cactus Plot for metaroom 2023.

Table 28: Benchmark `2026-ml4acopf-2024`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	α-β-CROWN	62	6	0	0	680	100.0	98.6%
2	Vibecheck	60	6	0	0	660	97.1	95.7%
3	NeuralSAT	45	3	0	0	480	70.6	69.6%
4	PyRAT	34	6	0	0	400	58.8	58.0%
5	NNV	16	3	0	0	190	27.9	27.5%
6	SuperSimple	17	0	0	0	170	25.0	24.6%
7	N2v	13	3	0	0	160	23.5	23.2%
8	SobolBox	0	3	0	0	30	4.4	4.3%
9	Agate	0	0	0	15	-2250	0	0.0%

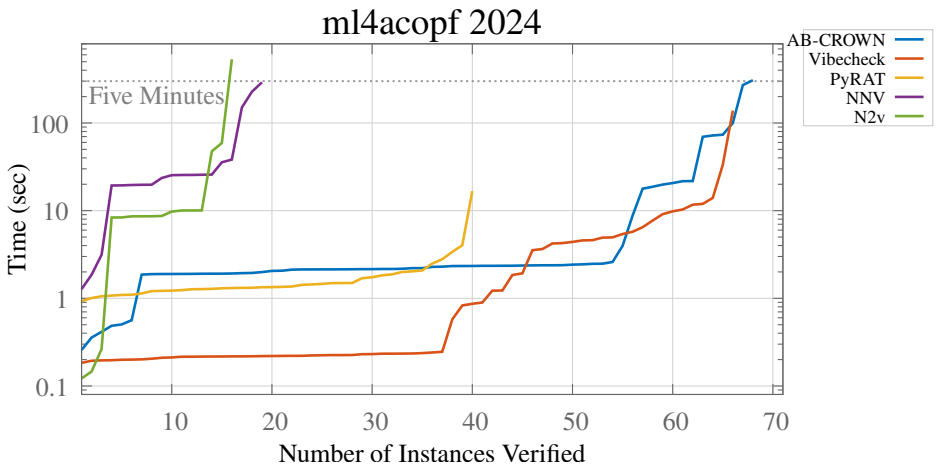


Figure 19: Cactus Plot for ml4acopf 2024.

Table 29: Benchmark `2026-nn4sys`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	α-β-CROWN	194	0	0	0	1940	100.0	100.0%
2	Vibecheck	184	0	0	0	1840	94.8	94.8%
3	PyRAT	163	0	0	0	1630	84.0	84.0%
4	NeuralSAT	121	0	0	0	1210	62.4	62.4%
5	N2v	37	0	0	0	370	19.1	19.1%
6	NNV	31	0	0	0	310	16.0	16.0%
7	SuperSimple	26	0	0	0	260	13.4	13.4%
8	nnenum	22	0	0	0	220	11.3	11.3%
9	Agate	0	0	0	1	-150	0	0.0%

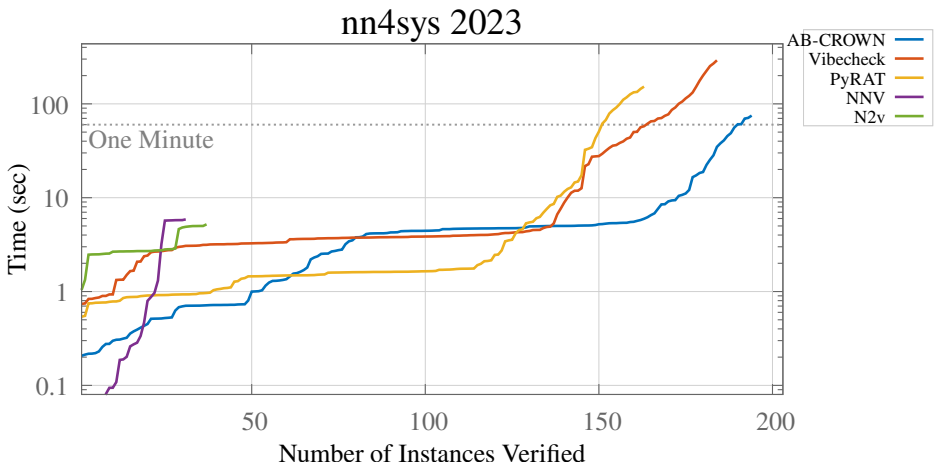


Figure 20: Cactus Plot for nn4sys 2023.

Table 30: Benchmark `2026-relusplitter-2026`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	96	24	0	0	1200	100.0	100.0%
2	α-β-CROWN	96	24	0	0	1200	100.0	100.0%
3	NeuralSAT	84	24	0	0	1080	90.0	90.0%
4	Act	90	18	0	0	1080	90.0	90.0%
5	PyRAT	70	24	0	0	940	78.3	78.3%
6	Bright	58	24	0	0	820	68.3	68.3%
7	NNV	51	6	0	0	570	47.5	47.5%
8	SuperSimple	28	24	0	0	520	43.3	43.3%
9	N2v	9	24	0	0	330	27.5	27.5%
10	Agate	0	0	0	18	-2700	0	0.0%

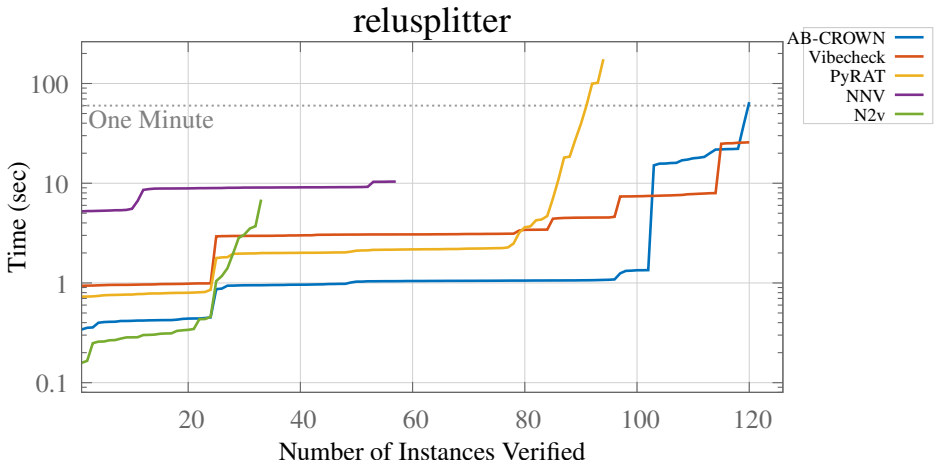


Figure 21: Cactus Plot for relusplitter.

Table 31: Benchmark `2026-safenlp-2024`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	418	662	0	0	10800	100.0	100.0%
2	α-β-CROWN	418	662	0	0	10800	100.0	100.0%
3	PyRAT	387	660	0	0	10470	96.9	96.9%
4	Bright	278	659	0	0	9370	86.8	86.8%
5	NNV	254	645	0	0	8990	83.2	83.2%
6	CORA	258	639	0	0	8970	83.1	83.1%
7	SuperSimple	161	662	0	0	8230	76.2	76.2%
8	N2v	161	644	0	0	8050	74.5	74.5%
9	Act	139	585	0	0	7240	67.0	67.0%
10	SobolBox	0	203	0	0	2030	18.8	18.8%
11	nnenum	262	579	0	54	310	2.9	77.9%
12	NeuralSAT	390	573	0	86	-3270	0	89.2%
13	Agate	162	0	0	661	-97530	0	15.0%

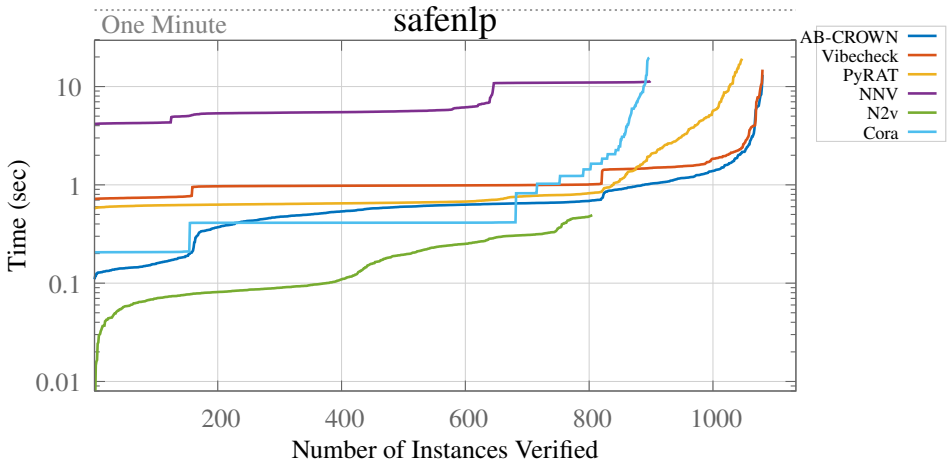


Figure 22: Cactus Plot for safenlp.

Table 32: Benchmark `2026-sat-relu`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	50	50	0	0	1000	100.0	100.0%
2	NeuralSAT	50	50	0	0	1000	100.0	100.0%
3	Bright	50	50	0	0	1000	100.0	100.0%
4	α-β-CROWN	50	50	0	0	1000	100.0	100.0%
5	PyRAT	39	50	0	0	890	89.0	89.0%
6	CORA	50	49	0	1	840	84.0	99.0%
7	Act	1	50	0	0	510	51.0	51.0%
8	NNV	0	50	0	0	500	50.0	50.0%
9	N2v	0	50	0	0	500	50.0	50.0%
10	SobolBox	0	49	0	0	490	49.0	49.0%
11	nnenum	3	28	0	0	310	31.0	31.0%
12	SuperSimple	31	34	0	14	-1450	0	65.0%
13	Agate	1	0	0	42	-6290	0	1.0%

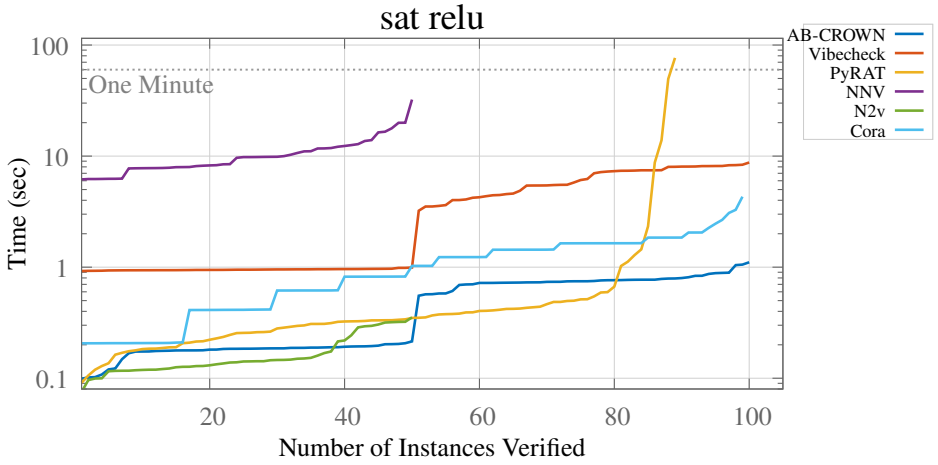


Figure 23: Cactus Plot for sat relu.

Table 33: Benchmark `2026-soundnessbench-2026`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	14	39	0	0	530	100.0	88.3%
2	α-β-CROWN	14	45	0	1	440	83.0	98.3%
3	PyRAT	14	7	0	0	210	39.6	35.0%
4	N2v	0	14	0	0	140	26.4	23.3%
5	CORA	14	0	0	0	140	26.4	23.3%
6	SuperSimple	11	0	0	0	110	20.8	18.3%
7	NeuralSAT	14	13	0	8	-930	0	45.0%

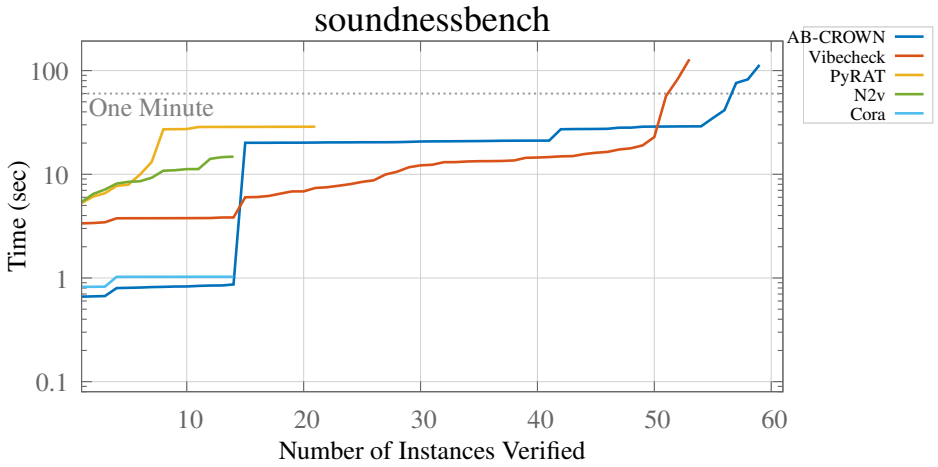


Figure 24: Cactus Plot for soundnessbench.

Table 34: Benchmark `2026-tinyimagenet-2024`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	139	39	0	0	1780	100.0	89.0%
2	α-β-CROWN	139	38	0	0	1770	99.4	88.5%
3	Bright	104	36	0	0	1400	78.7	70.0%
4	NeuralSAT	100	36	0	0	1360	76.4	68.0%
5	PyRAT	75	35	0	0	1100	61.8	55.0%
6	NNV	80	10	0	0	900	50.6	45.0%
7	SuperSimple	0	35	0	0	350	19.7	17.5%
8	N2v	0	35	0	0	350	19.7	17.5%

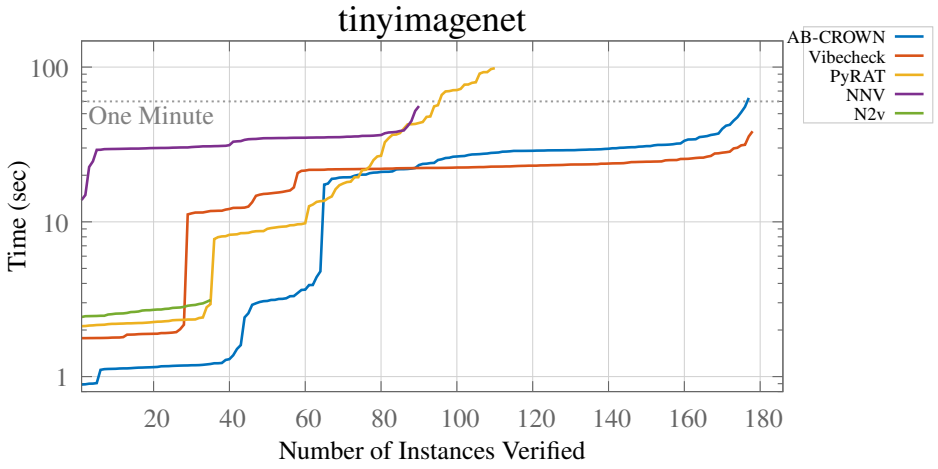


Figure 25: Cactus Plot for tinyimagenet.

Table 35: Benchmark `2026-tllverifybench-2023`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	20	12	0	0	320	100.0	100.0%
2	SobolBox	20	12	0	0	320	100.0	100.0%
3	PyRAT	20	12	0	0	320	100.0	100.0%
4	NeuralSAT	20	12	0	0	320	100.0	100.0%
5	α-β-CROWN	20	12	0	0	320	100.0	100.0%
6	CORA	19	12	0	0	310	96.9	96.9%
7	Bright	19	12	0	0	310	96.9	96.9%
8	NNV	8	12	0	0	200	62.5	62.5%
9	Act	13	7	0	0	200	62.5	62.5%
10	nnenum	3	11	0	0	140	43.8	43.8%
11	N2v	0	12	0	0	120	37.5	37.5%
12	Agate	6	0	0	12	-1740	0	18.8%

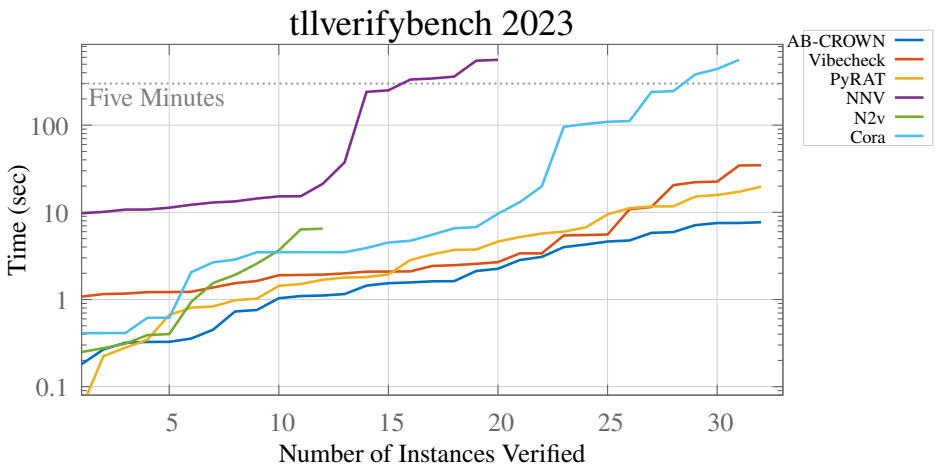


Figure 26: Cactus Plot for tllverifybench 2023.

Table 36: Benchmark `2026-traffic-signs-recognition-2023`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	α-β-CROWN	0	36	0	0	360	100.0	80.0%
2	Vibecheck	0	22	0	0	220	61.1	48.9%
3	PyRAT	0	1	0	0	10	2.8	2.2%

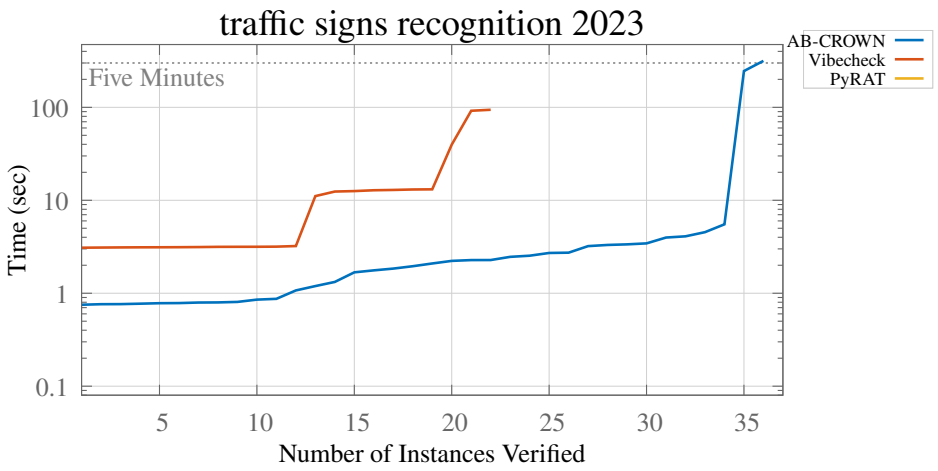


Figure 27: Cactus Plot for traffic signs recognition 2023.

Table 37: Benchmark `2026-vggnet16-2022`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	α-β-CROWN	18	0	0	0	180	100.0	100.0%
2	Vibecheck	16	0	0	0	160	88.9	88.9%
3	PyRAT	15	0	0	0	150	83.3	83.3%
4	NeuralSAT	15	0	0	0	150	83.3	83.3%

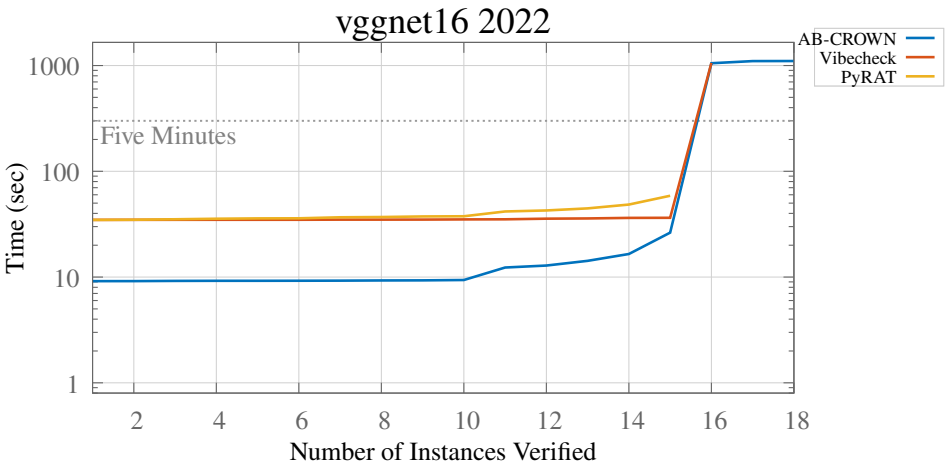


Figure 28: Cactus Plot for vggnet16 2022.

Table 38: Benchmark `2026-vit-2023`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Act	200	0	0	0	2000	100.0	100.0%
2	α-β-CROWN	123	0	0	0	1230	61.5	61.5%
3	Vibecheck	111	0	0	0	1110	55.5	55.5%
4	PyRAT	70	0	0	0	700	35.0	35.0%
5	NeuralSAT	63	0	0	0	630	31.5	31.5%
6	N2v	20	0	0	0	200	10.0	10.0%

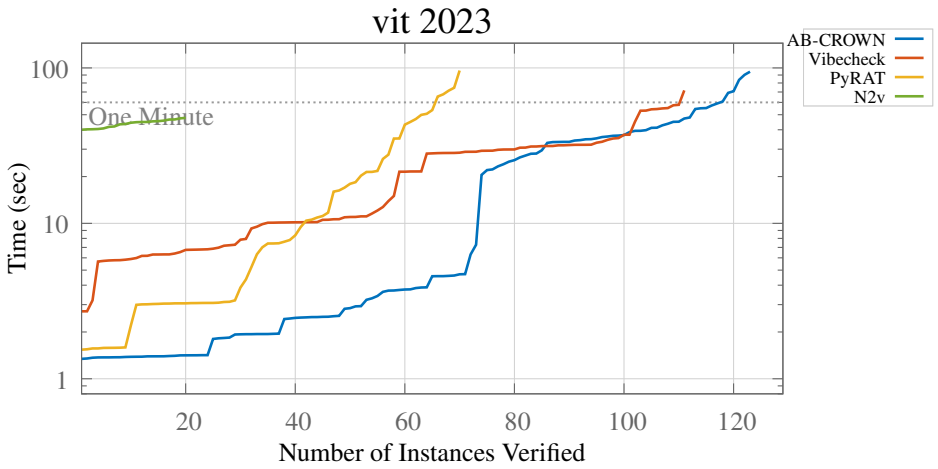


Figure 29: Cactus Plot for vit 2023.

Table 39: Benchmark `2026-yolo-2023`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	α-β-CROWN	66	0	0	0	660	100.0	91.7%
2	Vibecheck	64	0	0	0	640	97.0	88.9%
3	NeuralSAT	64	0	0	0	640	97.0	88.9%
4	PyRAT	50	0	0	0	500	75.8	69.4%
5	SuperSimple	8	0	0	0	80	12.1	11.1%

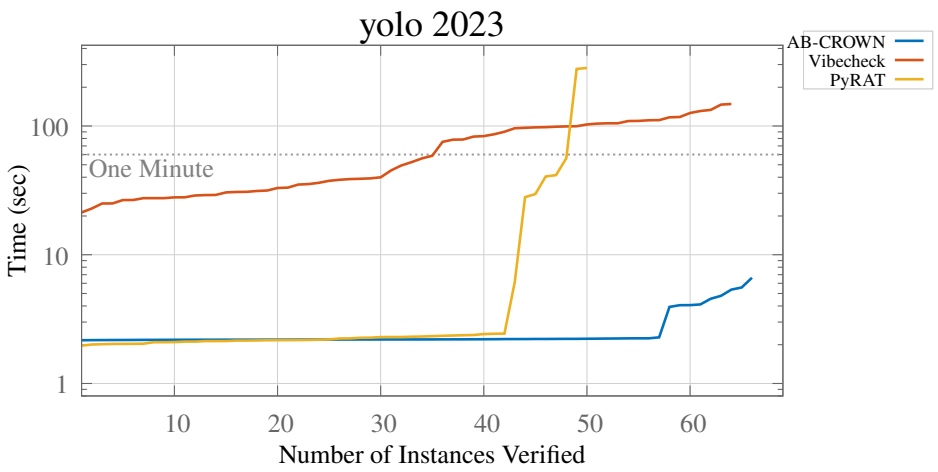


Figure 30: Cactus Plot for yolo 2023.

A.2 Extended Track

Table 40: Benchmark `2026-adaptive-cruise-control-non-linear-2026`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	α-β-CROWN	34	16	0	0	500	100.0	100.0%
2	Vibecheck	32	17	0	0	490	98.0	98.0%
3	PyRAT	32	17	0	0	490	98.0	98.0%
4	N2v	23	16	0	0	390	78.0	78.0%
5	NNV	18	1	0	0	190	38.0	38.0%

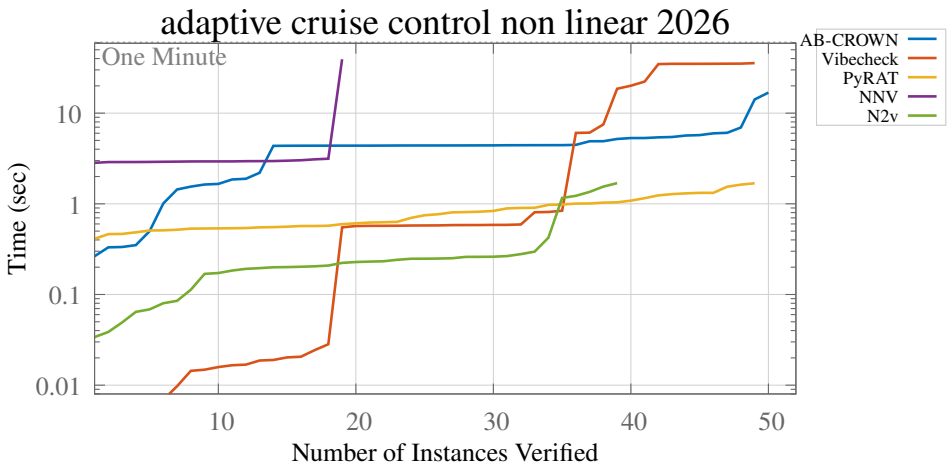


Figure 31: Cactus Plot for adaptive cruise control non linear 2026.

Table 41: Benchmark `2026-cctsdb-yolo-2023`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	11	28	0	0	390	100.0	100.0%
2	PyRAT	11	28	0	0	390	100.0	100.0%
3	NNV	11	28	0	0	390	100.0	100.0%
4	α-β-CROWN	11	28	0	0	390	100.0	100.0%

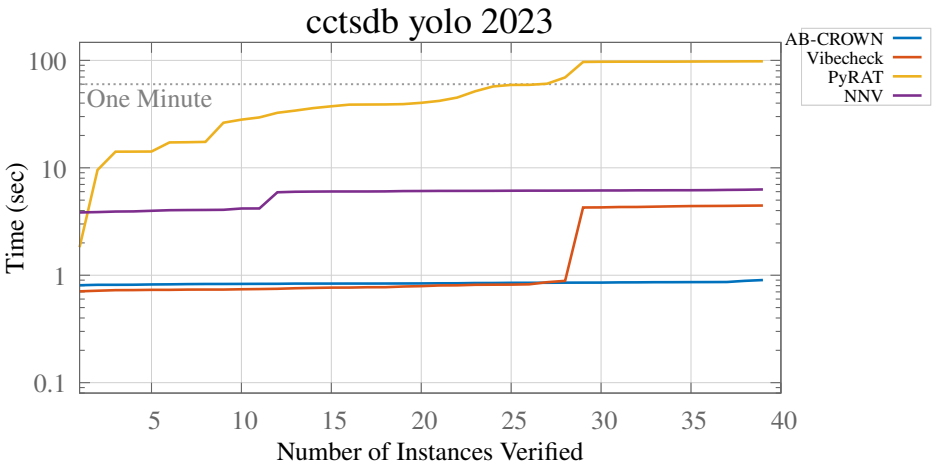


Figure 32: Cactus Plot for cctsdb yolo 2023.

Table 42: Benchmark `2026-collins-aerospace-benchmark`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	0	6	0	0	60	100.0	100.0%
2	PyRAT	0	6	0	0	60	100.0	100.0%
3	N2v	0	6	0	0	60	100.0	100.0%
4	α-β-CROWN	0	6	0	0	60	100.0	100.0%
5	NNV	0	2	0	0	20	33.3	33.3%

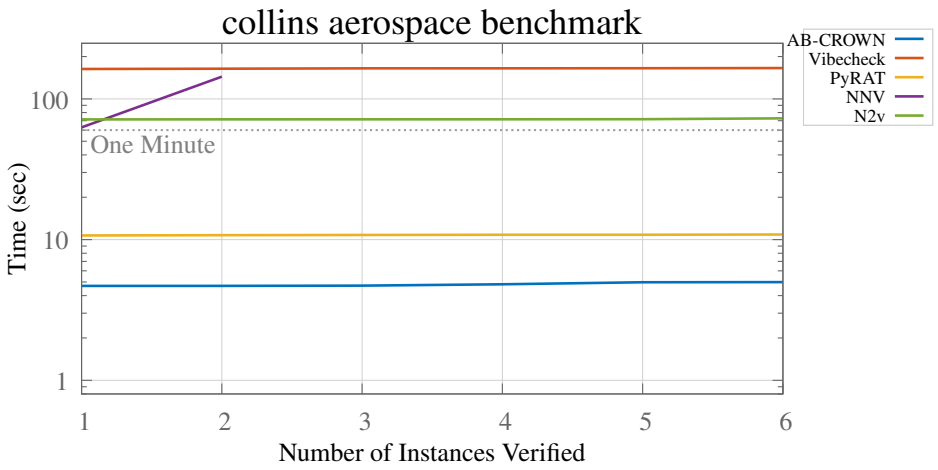


Figure 33: Cactus Plot for collins aerospace benchmark.

Table 43: Benchmark `2026-isomorphic-acasxu-2026`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	α-β-CROWN	46	4	0	0	500	100.0	100.0%
2	PyRAT	40	0	0	0	400	80.0	80.0%
3	Vibecheck	34	4	0	0	380	76.0	76.0%
4	CORA	28	4	0	0	320	64.0	64.0%

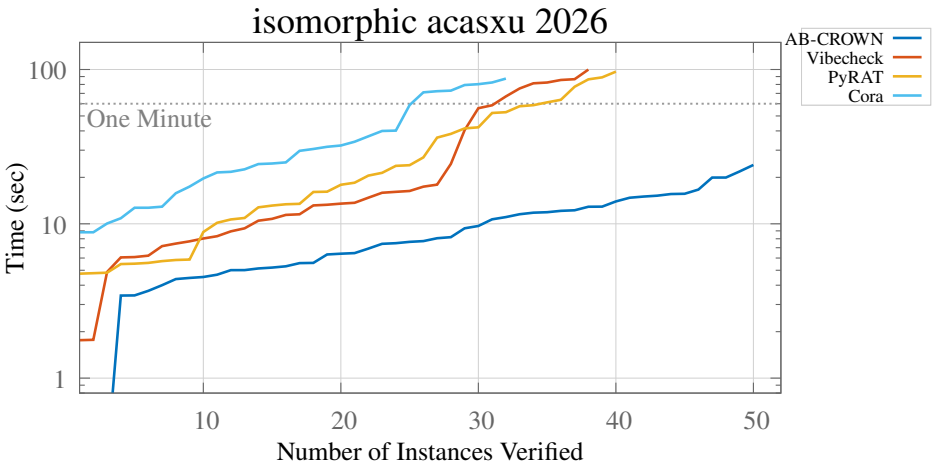


Figure 34: Cactus Plot for isomorphic acasxu 2026.

Table 44: Benchmark `2026-monotonic-acasxu-2026`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	0	50	0	0	500	100.0	100.0%
2	PyRAT	0	50	0	0	500	100.0	100.0%
3	NNV	0	50	0	0	500	100.0	100.0%
4	α-β-CROWN	0	50	0	0	500	100.0	100.0%
5	CORA	0	47	0	0	470	94.0	94.0%

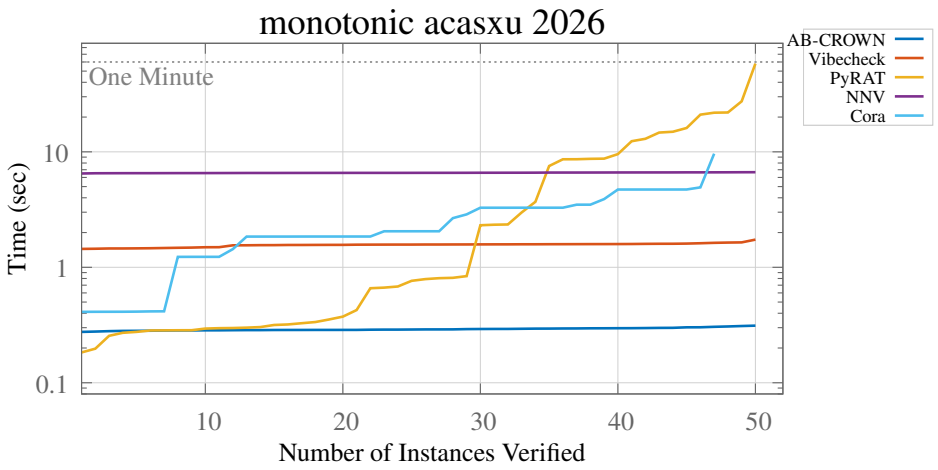


Figure 35: Cactus Plot for monotonic acasxu 2026.

Table 45: Benchmark `2026-smart-turn-multimodal-2026`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	Vibecheck	0	50	0	0	500	100.0	100.0%
2	α-β-CROWN	0	50	0	0	500	100.0	100.0%

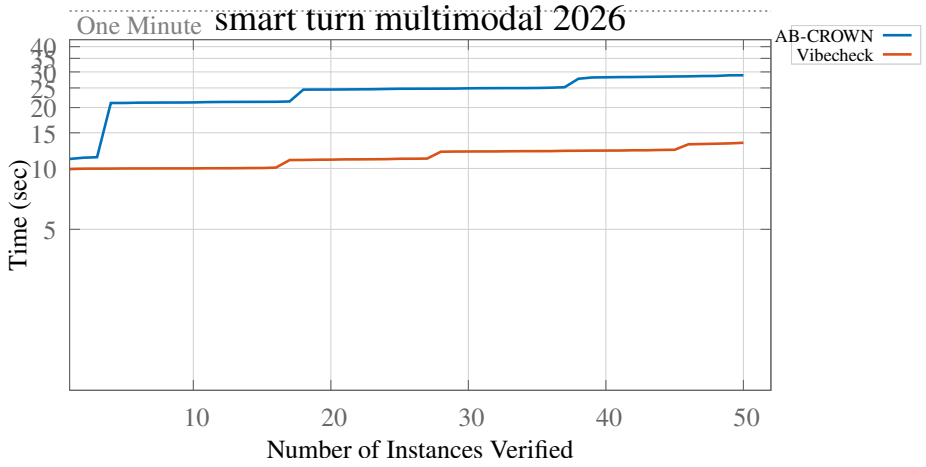


Figure 36: Cactus Plot for smart turn multimodal 2026.

B Instance Results

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v		SSimp	act	NNen	SB	agate
2026 Acasxu 2023	0	UNSAT	2.37	3.62	2.06	11.3	98.3	7.18	13.9	-	-	1.36	0.99	69.1	-
2026 Acasxu 2023	1	UNSAT	1.68	3.57	1.30	11.3	19.3	3.49	12.2	-	-	1.37	1.35	66.8	-
2026 Acasxu 2023	2	UNSAT	1.83	3.92	1.58	11.5	19.7	3.89	13.1	-	-	2.22	2.24	65.7	-
2026 Acasxu 2023	3	UNSAT	1.82	3.80	1.32	11.4	19.4	3.48	12.3	-	-	1.95	2.42	68.0	-
2026 Acasxu 2023	4	UNSAT	1.68	3.32	1.34	11.3	19.3	3.28	12.1	-	-	1.28	1.36	66.4	-
2026 Acasxu 2023	5	UNSAT	1.74	3.59	1.35	11.3	19.6	3.07	12.1	-	-	1.20	3.62	66.1	-
2026 Acasxu 2023	6	UNSAT	1.62	3.55	1.21	11.2	19.1	2.67	11.5	-	-	1.12	1.19	67.3	97.1
2026 Acasxu 2023	7	UNSAT	1.62	3.36	1.22	11.1	18.9	2.05	11.0	-	-	1.08	1.88	67.6	51.4
2026 Acasxu 2023	8	UNSAT	1.51	3.30	1.11	11.1	19.0	2.05	11.0	-	-	1.02	1.12	66.3	38.4
2026 Acasxu 2023	9	UNSAT	1.68	3.45	1.31	11.3	19.5	3.48	12.5	-	-	1.48	3.55	67.2	-
2026 Acasxu 2023	10	UNSAT	1.87	4.07	1.56	11.4	20.3	4.30	13.8	-	-	1.58	9.59	66.1	-
2026 Acasxu 2023	11	UNSAT	1.84	3.75	1.43	11.4	19.6	3.49	13.1	-	-	1.91	4.51	66.2	-
2026 Acasxu 2023	12	UNSAT	1.76	3.66	1.49	11.4	19.6	3.49	12.6	-	-	1.35	1.93	65.9	-
2026 Acasxu 2023	13	UNSAT	2.03	4.44	1.68	11.5	22.3	4.92	15.1	-	-	2.23	11.0	66.1	-
2026 Acasxu 2023	14	UNSAT	2.01	4.05	1.54	11.5	21.6	4.72	15.2	-	-	2.62	7.18	65.4	-
2026 Acasxu 2023	15	UNSAT	2.32	5.01	1.71	13.1	32.7	5.74	15.4	-	-	8.44	15.9	66.1	-
2026 Acasxu 2023	16	UNSAT	2.21	4.87	1.86	30.9	30.4	6.76	17.3	-	-	13.2	15.0	65.6	-
2026 Acasxu 2023	17	UNSAT	2.33	4.87	1.93	13.1	35.0	6.56	17.4	-	-	14.7	77.5	66.5	-
2026 Acasxu 2023	18	UNSAT	1.84	3.61	1.46	11.4	20.0	4.31	13.6	-	-	1.62	4.73	67.1	-
2026 Acasxu 2023	19	UNSAT	1.96	4.01	1.52	11.5	20.0	3.90	13.2	-	-	1.84	2.50	67.2	-
2026 Acasxu 2023	20	UNSAT	1.83	3.53	1.48	11.4	19.5	4.31	14.1	-	-	1.47	4.04	66.6	-
2026 Acasxu 2023	21	UNSAT	1.82	4.41	1.54	11.4	20.0	3.69	12.4	-	-	1.50	2.71	65.7	-
2026 Acasxu 2023	22	UNSAT	2.00	4.05	1.49	11.5	21.7	4.92	14.6	-	-	2.39	7.56	65.7	-
2026 Acasxu 2023	23	UNSAT	2.11	4.56	1.80	11.7	23.7	5.95	15.7	-	-	8.50	19.4	66.5	-
2026 Acasxu 2023	24	UNSAT	2.13	4.83	1.92	11.5	28.0	6.35	16.0	-	-	5.96	17.2	64.9	-
2026 Acasxu 2023	25	UNSAT	2.28	4.28	1.88	11.6	28.2	5.74	16.0	-	-	5.20	13.8	65.9	-
2026 Acasxu 2023	26	UNSAT	2.57	4.88	1.84	13.2	-	6.56	17.2	-	-	15.1	11.2	65.8	-
2026 Acasxu 2023	27	UNSAT	1.92	4.73	1.52	11.7	20.7	5.12	14.3	-	-	5.28	9.59	65.4	-
2026 Acasxu 2023	28	UNSAT	1.78	3.61	1.46	11.5	20.0	4.30	12.9	-	-	1.97	6.10	66.9	-
2026 Acasxu 2023	29	UNSAT	1.81	3.74	1.44	11.4	19.6	4.30	13.1	-	-	1.55	4.47	65.7	-
2026 Acasxu 2023	30	UNSAT	1.83	4.18	1.45	11.4	19.8	3.48	13.0	-	-	1.45	2.80	65.5	-
2026 Acasxu 2023	31	UNSAT	1.94	4.06	1.61	11.5	21.3	4.72	14.4	-	-	2.83	8.83	66.1	-
2026 Acasxu 2023	32	UNSAT	2.24	5.12	1.96	11.9	36.5	6.35	16.1	-	-	11.3	28.6	65.6	-
2026 Acasxu 2023	33	UNSAT	2.37	5.39	2.76	13.0	45.8	6.56	20.8	-	-	29.5	18.5	65.9	-
2026 Acasxu 2023	34	UNSAT	2.22	4.37	1.89	13.0	34.4	5.74	16.8	-	-	15.0	12.5	66.8	-
2026 Acasxu 2023	35	UNSAT	2.67	5.01	2.12	14.0	64.8	7.79	21.0	-	-	99.3	38.9	65.7	-
2026 Acasxu 2023	36	UNSAT	1.77	3.63	1.42	11.4	19.6	3.48	13.2	-	-	1.53	2.36	66.8	-
2026 Acasxu 2023	37	UNSAT	1.84	3.84	1.35	11.4	19.9	3.89	12.6	-	-	1.54	3.50	66.6	-
2026 Acasxu 2023	38	UNSAT	1.76	3.56	1.30	11.3	19.4	3.49	12.4	-	-	1.33	1.72	66.5	-
2026 Acasxu 2023	39	UNSAT	1.68	3.58	1.37	11.3	19.6	3.07	12.1	-	-	1.47	2.16	66.1	-
2026 Acasxu 2023	40	UNSAT	1.89	4.36	1.71	11.5	20.7	4.30	13.4	-	-	2.26	5.02	67.4	-
2026 Acasxu 2023	41	UNSAT	2.04	4.32	1.89	12.8	24.4	5.33	14.9	-	-	21.7	11.5	66.1	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Acasxu 2023	42	UNSAT	2.05	4.35	1.92	11.5	23.4	5.74	15.0	-	-	4.16	10.0	66.5	-
2026 Acasxu 2023	43	UNSAT	2.26	4.85	1.83	11.8	38.0	5.94	20.0	-	-	13.2	61.5	65.7	-
2026 Acasxu 2023	44	UNSAT	2.13	4.46	1.77	11.7	28.0	5.53	15.7	-	-	8.06	17.3	66.6	-
2026 Acasxu 2023	45	UNSAT	2.47	4.87	1.82	11.9	-	10.0	50.2	-	-	12.1	2.13	-	-
2026 Acasxu 2023	46	SAT	0.33	1.11	2.16	16.8	8.24	4.31	0.34	-	1.21	1.69	0.25	0.45	✗
2026 Acasxu 2023	47	SAT	0.36	1.20	2.81	17.4	7.26	6.97	48.9	-	-	1.96	4.80	-	✗
2026 Acasxu 2023	48	SAT	0.32	1.17	2.13	0.50	7.30	2.05	0.35	-	2.59	0.97	0.27	0.28	✗
2026 Acasxu 2023	49	SAT	0.47	3.76	5.82	-	7.28	7.99	0.35	-	-	76.1	✗	-	✗
2026 Acasxu 2023	50	SAT	0.31	3.79	2.32	0.56	7.30	4.92	0.32	-	-	22.1	2.64	0.42	✗
2026 Acasxu 2023	51	UNSAT	2.18	4.27	1.79	13.0	30.9	7.79	65.4	-	-	34.8	5.31	-	-
2026 Acasxu 2023	52	UNSAT	2.20	4.32	1.92	13.0	38.1	6.15	85.8	-	-	72.9	8.90	-	-
2026 Acasxu 2023	53	UNSAT	2.18	4.31	1.74	13.1	34.6	6.76	98.5	-	-	86.0	6.29	-	-
2026 Acasxu 2023	54	SAT	0.33	0.99	0.98	0.13	7.22	1.03	0.35	0.03	0.22	1.01	1.17	0.18	✗
2026 Acasxu 2023	55	SAT	0.32	1.16	0.98	0.05	7.25	0.82	0.35	0.24	4.49	0.91	0.10	0.17	✗
2026 Acasxu 2023	56	SAT	0.32	1.19	1.07	0.03	7.27	1.03	0.34	0.20	0.37	0.99	0.07	0.27	✗
2026 Acasxu 2023	57	SAT	0.33	1.02	0.63	0.07	7.30	0.82	0.34	0.05	1.20	0.89	0.11	0.32	✗
2026 Acasxu 2023	58	SAT	0.34	1.16	0.97	0.09	7.27	0.82	0.34	0.05	0.74	0.82	0.08	0.25	✗
2026 Acasxu 2023	59	SAT	0.31	1.19	1.41	0.06	7.28	0.82	0.36	0.07	2.21	0.86	0.09	0.22	✗
2026 Acasxu 2023	60	SAT	0.31	1.19	0.96	0.04	7.36	3.90	0.33	0.07	4.26	1.15	0.07	0.19	✗
2026 Acasxu 2023	61	SAT	0.32	1.17	0.57	0.06	7.30	3.89	0.35	0.23	6.13	1.69	0.07	0.22	✗
2026 Acasxu 2023	62	SAT	0.31	1.18	1.25	0.20	7.25	4.51	0.33	0.04	1.66	1.57	0.43	0.30	✗
2026 Acasxu 2023	63	SAT	0.31	1.09	1.17	0.06	7.30	1.03	0.33	0.05	1.46	0.83	0.07	0.25	✗
2026 Acasxu 2023	64	SAT	0.32	3.20	1.49	0.10	7.30	1.03	0.36	0.05	-	1.59	0.26	-	✗
2026 Acasxu 2023	65	UNSAT	12.9	18.1	13.1	43.0	-	-	-	-	-	-	67.0	-	-
2026 Acasxu 2023	66	SAT	0.32	1.12	1.06	0.13	7.23	1.03	0.33	0.04	2.68	0.88	0.07	0.22	✗
2026 Acasxu 2023	67	SAT	0.30	1.17	1.06	0.01	7.27	0.82	0.34	0.10	0.98	0.86	0.09	0.26	✗
2026 Acasxu 2023	68	SAT	0.31	1.01	1.25	0.05	7.34	3.28	0.36	0.06	0.58	1.26	0.66	0.33	✗
2026 Acasxu 2023	69	SAT	0.31	1.09	1.54	0.05	7.33	0.82	0.34	0.05	1.66	1.05	8.66	0.23	✗
2026 Acasxu 2023	70	SAT	0.32	1.17	0.56	0.05	7.28	0.82	0.34	0.20	0.85	0.85	0.35	0.22	✗
2026 Acasxu 2023	71	SAT	0.30	0.99	0.60	0.04	7.33	0.82	0.35	0.07	0.22	0.84	0.08	0.30	✗
2026 Acasxu 2023	72	SAT	0.31	1.17	1.16	0.16	7.39	1.44	0.34	0.06	-	0.85	0.11	0.28	✗
2026 Acasxu 2023	73	UNSAT	3.87	8.07	25.4	14.3	-	29.1	-	-	-	-	67.9	-	-
2026 Acasxu 2023	74	SAT	0.31	1.10	0.96	0.03	7.31	0.82	0.35	0.05	5.98	0.86	0.07	0.27	✗
2026 Acasxu 2023	75	SAT	0.32	1.17	0.50	0.03	7.24	0.82	0.33	0.04	4.72	0.91	0.28	0.34	✗
2026 Acasxu 2023	76	SAT	0.31	1.17	0.97	0.06	7.31	0.82	0.35	0.06	1.23	0.89	0.07	0.12	✗
2026 Acasxu 2023	77	SAT	0.31	0.99	0.62	0.07	7.36	0.82	0.33	0.22	0.39	1.70	0.07	0.21	✗
2026 Acasxu 2023	78	SAT	0.30	1.17	1.00	0.04	7.37	2.46	0.35	0.05	3.32	1.00	0.07	0.25	✗
2026 Acasxu 2023	79	SAT	0.34	0.99	0.57	0.09	7.20	3.89	0.34	0.21	0.48	1.59	0.09	0.19	✗
2026 Acasxu 2023	80	SAT	0.33	1.47	0.98	0.14	7.25	4.51	0.32	-	2.76	2.06	0.19	0.26	✗
2026 Acasxu 2023	81	SAT	0.31	1.17	1.07	0.06	7.29	1.23	0.35	0.05	0.23	0.88	0.08	0.15	✗
2026 Acasxu 2023	82	SAT	0.31	1.18	1.16	0.06	7.24	0.82	0.35	0.04	2.72	0.87	0.09	0.28	✗
2026 Acasxu 2023	83	SAT	0.52	5.35	3.24	-	7.23	44.5	35.9	-	-	-	14.6	-	✗
2026 Acasxu 2023	84	SAT	0.32	1.11	1.04	0.10	7.29	1.03	0.35	0.05	5.54	0.92	0.08	0.24	✗
2026 Acasxu 2023	85	SAT	0.31	1.20	0.96	0.11	7.30	2.46	0.35	0.07	2.56	1.03	0.10	0.23	✗
2026 Acasxu 2023	86	SAT	0.32	1.19	1.02	0.04	7.24	0.82	0.33	0.06	2.35	0.89	0.09	0.25	✗
2026 Acasxu 2023	87	SAT	0.33	1.18	1.03	0.03	7.24	3.89	0.36	0.07	-	1.14	0.09	0.15	✗
2026 Acasxu 2023	88	SAT	0.32	1.16	0.97	0.01	7.20	1.23	0.34	0.16	1.46	1.22	0.09	0.25	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Acasxu 2023	89	SAT	0.33	1.17	1.01	0.04	7.23	4.51	0.35	0.18	2.82	1.59	0.07	0.21	✗
2026 Acasxu 2023	90	UNSAT	2.17	5.91	3.29	13.1	-	6.15	-	-	-	-	2.44	-	-
2026 Acasxu 2023	91	UNSAT	1.59	4.38	1.47	11.7	31.3	3.69	50.3	-	-	5.95	2.30	-	57.3
2026 Acasxu 2023	92	UNSAT	1.60	5.05	1.67	12.9	-	67.0	62.7	38.9	-	16.5	0.84	-	-
2026 Acasxu 2023	93	UNSAT	1.42	3.15	1.14	11.5	18.0	2.05	10.4	14.4	9.52	1.48	0.24	66.7	23.7
2026 Acasxu 2023	94	UNSAT	1.40	3.44	1.20	11.5	17.9	1.44	14.2	17.3	9.64	1.18	0.28	67.6	24.0
2026 Acasxu 2023	95	UNSAT	0.26	1.65	0.97	11.4	17.9	0.62	1.88	6.33	6.55	1.25	0.13	66.3	23.2
2026 Acasxu 2023	96	SAT	0.27	0.99	0.55	0.03	7.28	0.41	0.35	0.07	0.24	0.83	0.10	0.21	✗
2026 Acasxu 2023	97	SAT	0.27	1.00	0.49	0.04	7.21	0.41	0.34	0.06	0.25	0.85	0.07	0.26	✗
2026 Acasxu 2023	98	SAT	0.33	1.01	0.53	0.05	7.35	0.41	0.35	0.28	0.27	0.84	0.08	0.16	✗
2026 Acasxu 2023	99	UNSAT	1.68	3.91	1.64	11.7	21.8	3.49	19.4	45.7	-	2.86	0.71	-	23.8
2026 Acasxu 2023	100	UNSAT	1.61	4.00	1.42	11.5	25.2	3.07	18.3	20.6	-	2.58	0.48	-	40.9
2026 Acasxu 2023	101	UNSAT	1.61	3.80	1.39	11.8	19.5	2.87	17.4	31.0	-	2.84	0.90	65.7	88.1
2026 Acasxu 2023	102	UNSAT	0.26	1.70	0.93	11.4	17.9	0.62	1.85	3.50	6.46	1.20	0.01	66.0	24.0
2026 Acasxu 2023	103	UNSAT	1.41	3.25	0.98	11.4	18.0	1.44	9.94	9.46	9.67	1.09	0.15	67.1	23.6
2026 Acasxu 2023	104	UNSAT	0.28	1.64	0.98	11.3	17.9	0.62	1.88	3.62	6.48	1.08	0.07	67.8	23.7
2026 Acasxu 2023	105	UNSAT	0.26	1.64	1.02	11.5	17.9	1.23	1.88	6.19	6.52	1.21	0.12	66.1	23.9
2026 Acasxu 2023	106	UNSAT	0.27	1.68	0.94	11.5	17.9	1.44	1.87	3.86	6.51	1.19	0.09	67.4	23.4
2026 Acasxu 2023	107	UNSAT	0.28	1.66	0.82	11.3	18.0	0.21	1.87	2.76	6.56	0.94	0.02	66.8	23.5
2026 Acasxu 2023	108	UNSAT	1.41	3.23	1.22	11.7	17.9	2.46	21.7	18.4	9.69	2.07	0.17	66.1	23.6
2026 Acasxu 2023	109	UNSAT	1.51	3.75	1.40	11.5	20.9	3.48	32.0	110	-	2.41	1.00	-	73.2
2026 Acasxu 2023	110	UNSAT	1.51	4.10	1.21	11.6	20.1	2.46	24.6	27.2	9.73	1.86	0.39	66.3	23.5
2026 Acasxu 2023	111	UNSAT	1.51	3.22	1.17	11.5	18.0	2.05	16.1	9.70	-	1.14	0.21	67.0	23.8
2026 Acasxu 2023	112	UNSAT	1.40	3.17	1.01	11.5	18.0	1.03	12.6	5.72	9.60	1.35	0.17	68.0	24.0
2026 Acasxu 2023	113	UNSAT	1.50	3.29	1.14	11.9	17.9	1.64	14.8	9.07	-	5.50	0.17	67.1	29.6
2026 Acasxu 2023	114	UNSAT	0.27	1.65	0.97	11.4	17.8	0.62	1.88	2.49	6.50	1.04	0.09	66.4	23.6
2026 Acasxu 2023	115	UNSAT	1.40	3.18	1.07	11.6	18.0	1.44	12.5	4.78	-	2.73	0.17	68.2	23.7
2026 Acasxu 2023	116	UNSAT	1.49	3.16	1.10	11.7	18.0	2.05	13.5	6.02	9.50	2.60	0.14	66.3	23.5
2026 Acasxu 2023	117	UNSAT	1.57	3.90	1.43	11.7	26.7	2.87	16.7	8.92	-	2.39	0.22	66.8	34.0
2026 Acasxu 2023	118	UNSAT	1.60	4.23	1.60	11.9	27.8	3.08	35.1	57.0	-	6.49	1.06	-	67.3
2026 Acasxu 2023	119	UNSAT	1.68	4.04	1.45	11.5	25.3	3.49	29.4	71.7	-	1.59	1.59	66.6	90.1
2026 Acasxu 2023	120	UNSAT	1.42	3.16	0.97	11.3	17.8	1.03	9.30	4.28	9.59	1.16	0.14	66.7	23.3
2026 Acasxu 2023	121	UNSAT	0.27	1.64	1.06	11.3	17.8	1.03	1.86	3.07	6.49	1.04	0.11	67.5	24.0
2026 Acasxu 2023	122	UNSAT	1.42	3.15	1.23	11.5	17.9	2.87	12.9	11.4	-	1.24	0.24	67.9	23.5
2026 Acasxu 2023	123	UNSAT	1.43	3.08	1.10	11.6	18.0	1.44	9.25	5.42	9.61	1.41	0.11	66.2	24.1
2026 Acasxu 2023	124	UNSAT	0.28	1.64	1.04	11.5	17.9	1.44	1.86	4.48	6.59	2.35	0.13	66.2	23.5
2026 Acasxu 2023	125	UNSAT	1.53	3.18	1.08	11.5	18.0	1.64	11.2	5.64	9.70	1.75	0.23	66.8	23.5
2026 Acasxu 2023	126	UNSAT	1.61	4.26	1.64	11.9	27.9	3.48	20.9	27.9	-	8.42	0.70	-	94.5
2026 Acasxu 2023	127	UNSAT	1.58	3.49	1.28	11.5	24.1	2.05	13.1	8.03	-	1.46	0.31	67.2	23.0
2026 Acasxu 2023	128	UNSAT	1.41	3.46	1.19	11.6	18.1	2.05	14.8	9.60	-	1.36	0.23	67.1	24.0
2026 Acasxu 2023	129	UNSAT	1.42	1.69	1.13	11.4	17.8	1.03	9.99	4.98	9.57	1.09	0.17	66.2	23.9
2026 Acasxu 2023	130	UNSAT	1.43	3.12	1.07	11.6	17.9	1.64	13.8	6.00	9.75	1.17	0.18	66.3	24.6
2026 Acasxu 2023	131	UNSAT	1.39	3.16	1.18	11.5	17.9	1.85	9.95	6.84	9.71	1.41	0.22	66.0	23.6
2026 Acasxu 2023	132	UNSAT	0.28	1.72	0.87	11.3	17.9	0.21	1.88	2.42	6.53	1.07	0.05	68.2	23.8
2026 Acasxu 2023	133	UNSAT	1.40	3.66	1.13	11.6	18.2	2.05	13.5	9.80	9.58	1.27	0.18	66.0	23.6
2026 Acasxu 2023	134	UNSAT	1.46	1.65	0.82	11.5	17.8	1.64	6.69	2.48	9.60	1.21	0.03	66.5	23.5
2026 Acasxu 2023	135	UNSAT	1.64	5.16	1.83	11.7	-	4.71	23.7	-	-	5.55	0.94	-	40.4

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Acasxu 2023	136	UNSAT	1.56	4.33	1.47	12.6	31.3	2.67	20.6	-	-	9.31	0.74	-	67.3
2026 Acasxu 2023	137	UNSAT	1.55	4.42	1.67	11.6	39.1	4.30	28.4	30.5	-	3.05	0.47	-	96.1
2026 Acasxu 2023	138	UNSAT	1.48	3.39	1.22	11.4	18.2	2.05	12.8	5.59	-	1.37	0.20	-	24.6
2026 Acasxu 2023	139	UNSAT	1.45	3.69	1.26	11.6	18.1	1.64	13.2	21.5	-	2.24	0.32	66.3	24.3
2026 Acasxu 2023	140	UNSAT	1.40	3.51	1.20	11.5	17.9	2.05	15.3	13.1	-	1.31	0.30	66.9	23.5
2026 Acasxu 2023	141	SAT	0.28	1.00	0.53	0.05	7.38	0.41	0.35	0.06	0.22	0.85	0.08	0.12	✗
2026 Acasxu 2023	142	SAT	0.28	1.00	0.56	0.04	7.24	0.41	0.35	0.07	0.22	0.87	0.08	0.20	✗
2026 Acasxu 2023	143	SAT	0.27	1.00	0.56	0.05	7.31	0.41	0.33	0.07	0.23	0.85	0.08	0.20	✗
2026 Acasxu 2023	144	UNSAT	1.42	3.36	1.18	11.5	18.0	2.05	18.3	15.6	-	1.33	0.30	-	24.0
2026 Acasxu 2023	145	UNSAT	1.46	3.46	1.19	11.8	17.7	2.05	17.9	14.7	-	4.30	0.36	-	23.7
2026 Acasxu 2023	146	UNSAT	1.42	3.26	1.07	11.5	18.1	1.44	14.2	5.14	9.66	1.25	0.21	65.8	23.2
2026 Acasxu 2023	147	UNSAT	1.43	3.11	1.04	11.5	17.9	1.03	9.92	4.79	9.68	1.10	0.13	65.9	23.2
2026 Acasxu 2023	148	UNSAT	1.42	3.20	1.08	11.5	18.0	2.05	12.8	11.6	9.72	1.15	0.23	66.3	23.2
2026 Acasxu 2023	149	UNSAT	1.41	3.24	1.14	11.5	18.0	1.44	13.2	6.56	-	1.45	0.21	66.6	23.9
2026 Acasxu 2023	150	UNSAT	1.43	3.29	1.03	11.4	17.9	1.44	12.1	4.26	9.61	1.07	0.13	65.8	23.6
2026 Acasxu 2023	151	UNSAT	1.55	3.39	1.13	11.5	18.0	2.05	15.2	10.2	-	1.16	0.28	66.5	24.0
2026 Acasxu 2023	152	UNSAT	0.27	1.69	0.88	11.3	17.9	0.62	1.86	3.40	6.56	0.96	0.04	66.8	23.5
2026 Acasxu 2023	153	UNSAT	1.43	3.46	1.22	11.8	18.0	1.64	15.3	14.1	9.79	3.66	0.20	65.9	23.7
2026 Acasxu 2023	154	UNSAT	1.49	3.47	1.13	11.5	18.1	1.44	17.7	23.1	9.59	1.47	0.30	66.4	23.9
2026 Acasxu 2023	155	UNSAT	0.29	1.68	0.98	11.4	17.9	1.44	1.87	5.19	6.54	1.14	0.10	67.7	25.0
2026 Acasxu 2023	156	UNSAT	1.45	3.15	1.03	11.3	17.9	1.03	9.96	5.47	9.75	1.22	0.16	66.3	23.8
2026 Acasxu 2023	157	UNSAT	1.44	3.13	1.12	11.4	18.0	1.64	12.7	14.4	9.57	1.22	0.25	65.8	23.9
2026 Acasxu 2023	158	UNSAT	1.47	3.15	1.05	11.5	17.8	1.03	10.4	7.62	9.71	1.40	0.14	67.3	24.3
2026 Acasxu 2023	159	UNSAT	1.44	3.07	1.04	11.5	18.0	1.03	12.1	5.79	9.57	1.26	0.20	66.1	23.6
2026 Acasxu 2023	160	UNSAT	1.49	3.40	1.15	11.4	17.9	1.64	13.7	4.48	-	1.13	0.21	67.3	39.8
2026 Acasxu 2023	161	UNSAT	1.41	3.10	1.14	11.5	17.9	1.64	12.7	13.2	-	1.39	0.30	67.1	23.4
2026 Acasxu 2023	162	UNSAT	0.29	1.68	0.99	11.6	17.8	0.62	1.88	4.32	9.55	1.50	0.12	-	23.2
2026 Acasxu 2023	163	UNSAT	1.45	3.24	1.16	11.6	18.0	2.05	13.7	6.16	9.67	1.36	0.19	67.9	23.3
2026 Acasxu 2023	164	UNSAT	1.43	3.30	1.13	11.5	18.0	1.44	14.4	10.9	9.60	1.37	0.19	65.9	23.6
2026 Acasxu 2023	165	UNSAT	1.42	3.17	1.09	11.4	17.7	1.44	13.4	6.70	-	1.28	0.19	67.1	34.8
2026 Acasxu 2023	166	UNSAT	1.42	3.09	1.02	11.5	17.9	1.03	10.4	5.87	9.82	1.16	0.10	66.6	23.9
2026 Acasxu 2023	167	UNSAT	1.42	3.08	1.04	11.3	17.6	1.03	6.64	9.53	9.64	1.05	0.16	66.0	23.5
2026 Acasxu 2023	168	UNSAT	1.43	3.12	1.07	11.5	18.1	1.43	10.0	3.15	9.58	1.34	0.10	67.7	23.5
2026 Acasxu 2023	169	UNSAT	1.43	3.24	1.15	11.6	18.0	2.46	9.91	7.83	9.64	1.26	0.20	67.4	24.0
2026 Acasxu 2023	170	UNSAT	1.45	3.05	1.05	11.4	18.0	1.23	9.97	10.2	9.53	1.38	0.15	67.2	23.5
2026 Acasxu 2023	171	UNSAT	1.43	3.10	1.14	11.5	17.9	1.44	13.3	18.1	9.61	1.59	0.17	67.3	23.4
2026 Acasxu 2023	172	UNSAT	1.44	3.19	1.06	11.4	17.8	1.03	10.0	13.1	9.66	1.17	0.11	67.2	23.6
2026 Acasxu 2023	173	UNSAT	1.42	3.35	1.01	11.5	17.9	1.03	13.5	7.41	9.58	1.20	0.17	66.0	23.8
2026 Acasxu 2023	174	UNSAT	1.40	3.11	1.05	11.3	18.0	1.03	9.96	5.45	9.62	1.07	0.16	66.0	23.9
2026 Acasxu 2023	175	UNSAT	1.49	3.10	1.06	11.5	18.0	1.64	9.88	7.48	9.66	1.18	0.16	65.6	23.4
2026 Acasxu 2023	176	UNSAT	0.27	3.15	1.02	11.5	17.9	1.03	9.91	5.08	6.54	2.15	0.17	66.8	23.5
2026 Acasxu 2023	177	UNSAT	0.28	1.62	1.01	11.5	18.0	1.03	1.87	2.82	6.56	1.06	0.10	66.7	23.2
2026 Acasxu 2023	178	UNSAT	1.40	3.18	1.06	11.5	17.9	1.44	13.4	4.69	9.55	1.26	0.18	67.4	23.8
2026 Acasxu 2023	179	UNSAT	1.42	3.09	1.00	11.5	18.0	1.03	12.9	6.02	9.61	1.09	0.10	66.6	23.8
2026 Acasxu 2023	180	UNSAT	2.48	5.86	3.23	12.2	-	11.7	107	-	-	✗	7.13	-	-
2026 Acasxu 2023	181	UNSAT	3.62	8.40	10.3	13.1	-	-	-	-	-	-	36.4	-	-
2026 Acasxu 2023	182	SAT	0.37	1.53	1.78	-	7.95	3.48	-	-	-	5.99	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Acasxu 2023	183	SAT	0.32	1.25	1.43	1.43	7.55	2.46	0.39	-	-	42.7	-	0.25	✗
2026 Acasxu 2023	184	UNSAT	2.24	4.77	2.12	13.0	36.7	7.17	-	-	-	✗	20.0	-	-
2026 Acasxu 2023	185	UNSAT	2.03	4.57	1.61	12.8	26.8	5.53	-	-	-	✗	2.62	66.8	-
2026 Cersyve	0	SAT	0.17	1.11	0.31	0.31	10.5	2.46	-	0.22	3.46	0.65	12.9	0.25	✗
2026 Cersyve	1	SAT	0.18	1.40	0.16	0.39	9.79	3.08	-	0.03	0.50	1.23	0.07	0.22	✗
2026 Cersyve	2	UNSAT	1.04	1.67	0.54	11.3	83.6	2.87	-	-	-	1.47	-	-	-
2026 Cersyve	3	UNSAT	1.96	2.54	7.43	12.1	-	17.4	-	-	-	60.8	-	-	-
2026 Cersyve	4	SAT	0.18	1.71	0.15	1.17	-	2.05	-	0.07	0.31	0.74	✗	0.28	✗
2026 Cersyve	5	SAT	0.21	1.14	0.15	0.09	10.3	3.28	-	0.09	2.69	0.90	-	0.17	✗
2026 Cersyve	6	UNSAT	1.41	2.25	0.81	11.6	-	3.49	-	-	-	3.36	-	-	-
2026 Cersyve	7	UNSAT	1.95	4.03	54.6	15.0	-	59.4	-	-	-	-	-	-	-
2026 Cersyve	8	SAT	0.18	1.12	0.14	0.17	-	1.44	-	0.05	0.71	0.91	0.17	0.27	✗
2026 Cersyve	9	SAT	0.19	1.25	0.18	0.36	10.5	3.48	-	0.08	0.78	1.19	-	0.25	✗
2026 Cersyve	10	UNSAT	1.41	2.20	1.55	11.7	-	6.76	-	-	-	-	-	-	-
2026 Cersyve	11	UNSAT	2.77	10.6	-	87.3	-	-	-	-	-	-	-	-	-
2026 Cgan2026	0	SAT	1.02	1.42	3.51	1.69	2.26	29.3	-	-	-	-	-	0.43	✗
2026 Cgan2026	1	SAT	0.49	1.27	1.02	3.20	58.9	-	-	-	-	-	-	12.9	-
2026 Cgan2026	2	UNSAT	121	22.4	99.5	-	-	-	-	-	-	-	-	31.8	✗
2026 Cgan2026	3	UNSAT	-	106	758	259	-	-	-	-	-	-	-	31.8	✗
2026 Cgan2026	4	SAT	0.53	1.21	84.1	0.34	7.40	4.10	-	0.30	-	-	-	0.51	✗
2026 Cgan2026	5	UNSAT	9.27	13.1	14.0	-	-	-	-	-	-	-	-	35.5	✗
2026 Cgan2026	6	UNSAT	46.7	21.6	42.9	-	-	-	-	-	-	-	-	35.2	✗
2026 Cgan2026	7	UNSAT	6.10	13.0	8.61	-	-	-	-	-	-	-	-	35.0	✗
2026 Cgan2026	8	SAT	0.55	1.35	25.3	0.46	9.63	4.92	-	0.58	-	-	-	0.55	-
2026 Cgan2026	9	SAT	0.51	1.45	3.46	3.52	39.2	-	-	-	-	-	-	✗	✗
2026 Cgan2026	10	UNSAT	7.50	20.7	3.44	119	-	-	-	-	-	-	-	35.9	✗
2026 Cgan2026	11	SAT	0.33	1.32	1.04	0.44	1.93	4.92	-	0.41	-	-	438	0.58	✗
2026 Cgan2026	12	UNSAT	56.5	25.5	15.7	145	-	-	-	-	-	-	-	41.1	✗
2026 Cgan2026	13	SAT	0.34	1.35	1.02	0.50	1.94	4.92	-	0.43	-	-	-	0.60	✗
2026 Cgan2026	14	SAT	0.48	1.35	1.09	0.49	9.37	5.12	-	0.59	-	-	-	0.54	✗
2026 Cgan2026	15	UNSAT	43.8	23.4	46.1	228	-	-	-	-	-	-	-	41.7	✗
2026 Cgan2026	16	SAT	0.60	1.46	-	0.61	58.4	-	-	0.55	-	-	-	✗	✗
2026 Cgan2026	17	SAT	0.40	1.27	1.01	0.56	2.19	3.90	-	-	-	-	-	0.48	✗
2026 Cgan2026	18	SAT	0.58	1.44	1.05	0.48	-	-	-	-	-	-	-	0.45	✗
2026 Cgan2026	19	UNSAT	67.2	-	-	-	-	-	-	-	-	-	-	84.1	-
2026 Cgan2026	20	SAT	2.27	6.76	12.3	16.1	32.9	-	-	-	-	-	-	5.23	✗
2026 Challenging Certified Training 2026	0	UNSAT	2.48	1.44	21.8	5.78	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	1	SAT	6.56	2.07	3.84	2.36	7.59	-	-	1.47	0.67	-	-	-	✗
2026 Challenging Certified Training 2026	2	UNSAT	8.94	39.9	89.3	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	3	UNSAT	8.37	26.9	69.2	62.2	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	4	UNSAT	490	116	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	5	UNSAT	89.0	74.7	-	422	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	6	UNSAT	518	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	7	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	8	?	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Challenging Certified Training 2026	9	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	10	UNSAT	6.67	3.22	-	6.75	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	11	SAT	20.0	4.51	6.85	4.06	10.5	-	-	3.07	1.43	-	-	-	✗
2026 Challenging Certified Training 2026	12	UNSAT	15.2	70.0	-	77.9	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	13	UNSAT	28.3	67.7	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	14	UNSAT	481	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	15	UNSAT	298	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	16	UNSAT	181	75.3	-	531	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	17	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	18	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	19	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	20	UNSAT	3.65	0.97	19.1	12.1	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	21	UNSAT	1.89	1.02	11.7	5.46	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	22	UNSAT	13.0	34.6	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	23	UNSAT	11.6	31.4	39.8	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	24	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	25	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	26	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	27	SAT	11.8	2.35	-	-	-	-	-	-	31.1	-	-	-	-
2026 Challenging Certified Training 2026	28	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	29	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	30	SAT	28.8	3.98	6.79	5.00	-	-	-	-	10.7	-	-	-	✗
2026 Challenging Certified Training 2026	31	UNSAT	15.1	1.09	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	32	UNSAT	47.2	40.6	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	33	UNSAT	33.1	30.2	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	34	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	35	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	36	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	37	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	38	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	39	SAT	-	4.20	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	40	SAT	4.83	2.50	4.62	-	-	-	-	-	7.87	-	-	-	-
2026 Challenging Certified Training 2026	41	SAT	1.93	2.49	4.52	28.7	23.2	-	-	2.37	0.86	-	-	-	-
2026 Challenging Certified Training 2026	42	UNSAT	25.4	90.5	-	17.7	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	43	UNSAT	27.6	93.0	-	17.8	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	44	UNSAT	56.4	-	-	82.3	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	45	UNSAT	59.7	363	-	86.2	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	46	UNSAT	286	-	-	373	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	47	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	48	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	49	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	50	SAT	3.65	4.16	7.80	-	-	-	-	4.66	8.59	-	-	-	-
2026 Challenging Certified Training 2026	51	SAT	17.0	-	8.21	-	-	-	-	-	2.74	-	-	-	-
2026 Challenging Certified Training 2026	52	SAT	38.6	8.20	8.27	-	-	-	-	-	1.61	-	-	-	-
2026 Challenging Certified Training 2026	53	SAT	55.7	8.18	8.07	-	-	-	-	-	1.83	-	-	-	-
2026 Challenging Certified Training 2026	54	UNSAT	69.4	246	-	14.0	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	55	UNSAT	63.5	235	-	14.2	-	-	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Challenging Certified Training 2026	56	UNSAT	68.7	245	-	14.1	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	57	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	58	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Challenging Certified Training 2026	59	SAT	28.7	8.32	8.77	-	-	-	-	-	10.4	-	-	-	-
2026 Cifar100 2024	0	SAT	1.08	1.55	1.91	5.34	28.2	-	3.17	1.01	0.67	4.13	-	-	-
2026 Cifar100 2024	1	UNSAT	28.5	16.3	54.4	40.5	56.5	-	-	-	-	-	-	-	-
2026 Cifar100 2024	2	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	3	UNSAT	2.58	16.3	3.74	21.0	35.5	-	27.9	-	-	25.4	-	-	-
2026 Cifar100 2024	4	UNSAT	18.9	15.3	5.65	29.7	36.3	-	28.7	-	-	37.5	-	-	-
2026 Cifar100 2024	5	SAT	1.05	1.65	2.07	5.81	-	-	3.13	0.80	1.41	29.5	-	-	-
2026 Cifar100 2024	6	UNSAT	11.7	18.1	51.4	48.4	57.3	-	-	-	-	-	-	-	-
2026 Cifar100 2024	7	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	8	SAT	1.03	1.53	1.89	5.43	-	-	3.14	0.59	0.72	4.00	-	-	-
2026 Cifar100 2024	9	SAT	1.03	1.60	1.88	5.55	-	-	3.14	0.62	0.84	4.18	-	-	-
2026 Cifar100 2024	10	UNSAT	19.0	16.6	11.6	32.8	38.5	-	30.6	-	-	50.0	-	-	-
2026 Cifar100 2024	11	UNSAT	32.2	63.5	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	12	UNSAT	19.0	16.5	7.43	32.6	37.1	-	29.2	-	-	37.8	-	-	-
2026 Cifar100 2024	13	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	14	UNSAT	18.9	15.5	44.6	35.2	44.7	-	41.4	-	-	91.3	-	-	-
2026 Cifar100 2024	15	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	16	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	17	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	18	UNSAT	19.0	16.3	60.9	37.9	47.6	-	-	-	-	-	-	-	-
2026 Cifar100 2024	19	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	20	SAT	1.05	1.53	1.92	5.56	17.5	-	3.16	0.55	0.49	4.24	-	-	-
2026 Cifar100 2024	21	UNSAT	19.0	15.7	4.76	31.1	36.4	-	28.5	-	-	37.7	-	-	-
2026 Cifar100 2024	22	UNSAT	19.4	16.4	4.89	27.1	35.5	-	28.0	-	-	38.5	-	-	-
2026 Cifar100 2024	23	UNSAT	18.8	17.0	4.79	29.4	36.1	-	28.5	-	-	38.1	-	-	-
2026 Cifar100 2024	24	SAT	1.03	1.64	1.96	5.63	-	-	3.17	0.77	1.17	4.03	-	-	-
2026 Cifar100 2024	25	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	26	UNSAT	18.8	15.3	4.64	25.5	35.5	-	28.0	-	-	37.5	-	-	-
2026 Cifar100 2024	27	UNSAT	18.9	15.6	6.86	30.1	37.6	-	29.4	-	-	37.9	-	-	-
2026 Cifar100 2024	28	UNSAT	2.56	8.61	3.63	21.0	34.4	-	28.0	-	-	25.1	-	-	-
2026 Cifar100 2024	29	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	30	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	31	UNSAT	18.8	15.4	5.93	27.9	36.7	-	28.5	-	-	37.6	-	-	-
2026 Cifar100 2024	32	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	33	UNSAT	19.0	16.6	-	56.1	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	34	UNSAT	20.9	24.5	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	35	UNSAT	18.9	17.8	7.37	29.7	38.9	-	29.2	-	-	42.4	-	-	-
2026 Cifar100 2024	36	UNSAT	19.6	23.0	-	65.6	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	37	UNSAT	18.6	15.2	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	38	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	39	SAT	1.01	1.61	1.97	5.49	-	-	3.11	0.79	0.74	3.94	-	-	-
2026 Cifar100 2024	40	SAT	1.04	1.59	1.98	5.81	-	-	3.15	0.73	1.12	-	-	-	-
2026 Cifar100 2024	41	UNSAT	19.3	15.4	20.0	38.3	44.1	-	62.4	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Cifar100 2024	42	UNSAT	19.0	20.5	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	43	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	44	SAT	1.02	1.51	1.91	5.41	25.5	-	3.14	0.63	0.60	3.81	-	-	-
2026 Cifar100 2024	45	UNSAT	19.0	15.6	4.63	29.0	35.7	-	28.5	-	-	37.6	-	-	-
2026 Cifar100 2024	46	UNSAT	18.9	16.3	7.21	32.0	37.1	-	29.6	-	-	37.8	-	-	-
2026 Cifar100 2024	47	UNSAT	18.6	15.1	9.92	29.6	37.0	-	29.4	-	-	54.4	-	-	-
2026 Cifar100 2024	48	UNSAT	18.8	15.4	-	50.9	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	49	UNSAT	2.57	7.92	3.62	21.1	34.5	-	23.5	-	-	25.3	-	-	-
2026 Cifar100 2024	50	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	51	UNSAT	18.9	16.4	-	53.3	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	52	UNSAT	2.43	7.64	3.64	20.7	34.7	-	22.0	-	-	25.1	-	-	-
2026 Cifar100 2024	53	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	54	UNSAT	18.9	16.6	8.73	36.1	38.6	-	30.8	-	-	45.8	-	-	-
2026 Cifar100 2024	55	UNSAT	18.6	15.9	-	52.8	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	56	SAT	1.05	1.55	1.88	5.43	36.4	-	3.12	0.60	1.08	29.8	-	-	-
2026 Cifar100 2024	57	UNSAT	19.0	19.4	-	53.4	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	58	UNSAT	18.9	16.2	7.86	31.4	38.0	-	29.8	-	-	50.5	-	-	-
2026 Cifar100 2024	59	SAT	1.01	1.54	1.95	5.30	-	-	3.19	0.60	0.75	4.07	-	-	-
2026 Cifar100 2024	60	UNSAT	3.03	17.8	3.58	21.9	35.3	-	28.1	-	-	25.7	-	-	-
2026 Cifar100 2024	61	SAT	1.10	1.54	1.86	5.31	36.9	-	3.19	0.58	0.95	52.7	-	-	-
2026 Cifar100 2024	62	UNSAT	18.9	16.0	75.6	36.1	48.1	-	46.9	-	-	-	-	-	-
2026 Cifar100 2024	63	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	64	UNSAT	18.9	15.3	11.8	35.8	39.8	-	33.3	-	-	58.8	-	-	-
2026 Cifar100 2024	65	UNSAT	19.3	18.7	-	64.2	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	66	UNSAT	21.6	24.6	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	67	UNSAT	19.1	17.3	64.1	44.6	61.2	-	-	-	-	-	-	-	-
2026 Cifar100 2024	68	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	69	UNSAT	18.9	15.6	-	51.8	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	70	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	71	UNSAT	18.9	18.6	15.9	31.1	40.9	-	31.4	-	-	45.6	-	-	-
2026 Cifar100 2024	72	UNSAT	19.1	18.8	4.83	26.7	37.4	-	29.5	-	-	38.7	-	-	-
2026 Cifar100 2024	73	UNSAT	19.0	15.7	7.29	31.5	36.8	-	29.2	-	-	38.0	-	-	-
2026 Cifar100 2024	74	UNSAT	19.0	15.7	4.73	29.3	35.7	-	28.3	-	-	38.2	-	-	-
2026 Cifar100 2024	75	UNSAT	18.9	17.2	-	72.3	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	76	SAT	1.02	1.59	2.00	5.46	-	-	3.12	0.90	1.16	3.95	-	-	-
2026 Cifar100 2024	77	UNSAT	19.8	22.9	-	88.1	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	78	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	79	UNSAT	29.3	21.9	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	80	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	81	UNSAT	18.9	16.2	-	61.6	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	82	UNSAT	11.4	18.8	24.8	42.7	47.8	-	56.1	-	-	-	-	-	-
2026 Cifar100 2024	83	UNSAT	36.1	30.7	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	84	UNSAT	2.57	7.55	3.54	20.9	34.3	-	23.5	-	-	25.1	-	-	-
2026 Cifar100 2024	85	SAT	1.03	1.65	1.99	6.84	-	-	3.13	0.97	1.40	29.9	-	-	-
2026 Cifar100 2024	86	UNSAT	18.9	16.1	19.0	31.6	41.1	-	31.4	-	-	71.8	-	-	-
2026 Cifar100 2024	87	UNSAT	18.8	15.3	21.1	35.2	43.6	-	33.1	-	-	90.7	-	-	-
2026 Cifar100 2024	88	UNSAT	18.9	15.6	5.75	28.9	38.0	-	29.2	-	-	37.7	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Cifar100 2024	89	UNSAT	18.9	17.1	4.69	30.9	36.2	-	28.4	-	-	37.8	-	-	-
2026 Cifar100 2024	90	UNSAT	18.8	15.8	6.92	29.7	36.7	-	29.0	-	-	37.6	-	-	-
2026 Cifar100 2024	91	UNSAT	18.8	15.1	7.42	31.7	37.5	-	29.3	-	-	46.1	-	-	-
2026 Cifar100 2024	92	SAT	1.02	1.51	1.89	5.36	22.3	-	3.12	0.58	0.64	30.1	-	-	-
2026 Cifar100 2024	93	UNSAT	18.9	16.0	8.47	27.7	37.0	-	28.7	-	-	37.4	-	-	-
2026 Cifar100 2024	94	UNSAT	19.1	17.9	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	95	UNSAT	24.3	60.1	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	96	UNSAT	19.8	21.1	-	66.5	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	97	UNSAT	60.7	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	98	UNSAT	18.8	15.2	37.7	39.2	42.9	-	41.6	-	-	-	-	-	-
2026 Cifar100 2024	99	UNSAT	19.0	15.6	5.72	30.8	37.3	-	29.5	-	-	38.0	-	-	-
2026 Cifar100 2024	100	UNSAT	24.5	29.5	13.6	64.8	44.8	-	75.2	-	-	-	-	-	-
2026 Cifar100 2024	101	UNSAT	3.10	28.4	7.74	23.0	37.5	-	68.4	-	-	-	-	-	-
2026 Cifar100 2024	102	UNSAT	23.5	25.9	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	103	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	104	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	105	UNSAT	42.3	43.2	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	106	SAT	1.09	2.04	2.10	5.76	28.5	-	4.06	0.81	0.78	-	-	-	-
2026 Cifar100 2024	107	UNSAT	24.5	30.2	16.7	-	43.0	-	78.0	-	-	-	-	-	-
2026 Cifar100 2024	108	UNSAT	24.0	24.8	20.6	78.9	38.8	-	69.9	-	-	-	-	-	-
2026 Cifar100 2024	109	UNSAT	24.5	27.5	16.2	67.6	41.8	-	70.0	-	-	-	-	-	-
2026 Cifar100 2024	110	UNSAT	2.80	15.4	6.93	24.6	35.4	-	63.6	-	-	-	-	-	-
2026 Cifar100 2024	111	UNSAT	2.80	11.9	4.22	22.3	35.5	-	63.6	-	-	-	-	-	-
2026 Cifar100 2024	112	SAT	1.13	2.11	2.09	5.77	-	-	4.06	0.93	1.23	-	-	-	-
2026 Cifar100 2024	113	SAT	1.15	2.05	2.12	5.71	-	-	4.06	0.85	1.05	-	-	-	-
2026 Cifar100 2024	114	SAT	1.14	2.04	2.22	6.09	-	-	4.06	0.99	1.40	-	-	-	-
2026 Cifar100 2024	115	UNSAT	24.9	23.6	-	77.9	72.8	-	95.8	-	-	-	-	-	-
2026 Cifar100 2024	116	SAT	1.12	2.08	2.14	6.00	25.0	-	4.03	0.72	0.63	-	-	-	-
2026 Cifar100 2024	117	UNSAT	25.5	25.2	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	118	UNSAT	23.4	22.2	8.99	47.2	36.9	-	69.1	-	-	-	-	-	-
2026 Cifar100 2024	119	UNSAT	24.5	26.5	15.4	62.9	37.3	-	69.1	-	-	-	-	-	-
2026 Cifar100 2024	120	UNSAT	44.1	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	121	UNSAT	29.5	30.7	-	79.6	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	122	UNSAT	24.7	23.7	9.02	54.9	36.7	-	68.5	-	-	-	-	-	-
2026 Cifar100 2024	123	UNSAT	24.4	25.0	9.86	75.0	39.1	-	70.6	-	-	-	-	-	-
2026 Cifar100 2024	124	SAT	1.09	2.12	2.11	5.59	-	-	4.06	0.88	1.12	-	-	-	-
2026 Cifar100 2024	125	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	126	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	127	SAT	1.13	2.04	2.14	5.78	-	-	4.09	0.85	1.13	-	-	-	-
2026 Cifar100 2024	128	UNSAT	17.6	30.8	55.8	72.7	45.8	-	77.7	-	-	-	-	-	-
2026 Cifar100 2024	129	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	130	UNSAT	24.3	26.9	23.4	65.7	39.7	-	70.1	-	-	-	-	-	-
2026 Cifar100 2024	131	SAT	1.22	2.11	2.11	6.14	-	-	4.04	0.82	0.97	-	-	-	-
2026 Cifar100 2024	132	SAT	1.19	2.03	2.06	5.68	-	-	4.04	0.95	0.90	-	-	-	-
2026 Cifar100 2024	133	SAT	1.17	3.73	2.32	56.1	-	-	4.06	-	2.32	-	-	-	-
2026 Cifar100 2024	134	UNSAT	2.51	16.7	7.24	29.2	36.4	-	64.6	-	-	-	-	-	-
2026 Cifar100 2024	135	?	-	-	-	-	-	-	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v		SSimp	act	NNen	SB	agate
2026 Cifar100 2024	136	UNSAT	25.0	31.4	17.8	84.7	37.5	-	71.0	-	-	-	-	-	-	-
2026 Cifar100 2024	137	UNSAT	4.37	27.8	8.19	89.6	37.4	-	70.3	-	-	-	-	-	-	-
2026 Cifar100 2024	138	UNSAT	24.4	25.6	25.2	67.8	38.9	-	70.5	-	-	-	-	-	-	-
2026 Cifar100 2024	139	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	140	UNSAT	18.2	35.6	54.6	55.8	48.5	-	84.6	-	-	-	-	-	-	-
2026 Cifar100 2024	141	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	142	UNSAT	2.55	16.3	6.69	22.1	36.2	-	63.6	-	-	-	-	-	-	-
2026 Cifar100 2024	143	UNSAT	25.4	26.7	28.1	38.2	40.3	-	72.0	-	-	-	-	-	-	-
2026 Cifar100 2024	144	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	145	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	146	UNSAT	3.38	30.4	7.06	23.9	36.6	-	68.5	-	-	-	-	-	-	-
2026 Cifar100 2024	147	UNSAT	2.98	16.1	5.32	24.1	35.6	-	68.6	-	-	-	-	-	-	-
2026 Cifar100 2024	148	UNSAT	3.04	24.3	6.08	26.9	37.4	-	69.1	-	-	-	-	-	-	-
2026 Cifar100 2024	149	UNSAT	3.30	29.3	6.60	28.7	37.3	-	69.2	-	-	-	-	-	-	-
2026 Cifar100 2024	150	UNSAT	33.7	67.8	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	151	UNSAT	24.5	28.9	9.14	31.9	36.6	-	69.2	-	-	-	-	-	-	-
2026 Cifar100 2024	152	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	153	UNSAT	33.7	44.3	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	154	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	155	UNSAT	24.3	25.8	18.5	55.0	40.0	-	70.9	-	-	-	-	-	-	-
2026 Cifar100 2024	156	UNSAT	24.9	30.5	10.9	44.2	39.0	-	69.5	-	-	-	-	-	-	-
2026 Cifar100 2024	157	UNSAT	2.81	13.9	5.97	22.7	35.9	-	63.6	-	-	-	-	-	-	-
2026 Cifar100 2024	158	SAT	1.10	2.08	2.06	5.89	35.0	-	4.06	0.77	0.79	-	-	-	-	-
2026 Cifar100 2024	159	SAT	1.12	1.97	2.05	5.72	18.3	-	4.09	0.71	0.65	-	-	-	-	-
2026 Cifar100 2024	160	UNSAT	23.8	24.3	9.25	66.3	35.7	-	68.5	-	-	-	-	-	-	-
2026 Cifar100 2024	161	UNSAT	24.0	29.1	19.2	55.2	43.2	-	73.7	-	-	-	-	-	-	-
2026 Cifar100 2024	162	UNSAT	25.3	31.0	12.0	74.6	37.8	-	69.8	-	-	-	-	-	-	-
2026 Cifar100 2024	163	SAT	1.14	2.03	2.08	5.75	30.3	-	4.06	0.76	0.78	-	-	-	-	-
2026 Cifar100 2024	164	UNSAT	3.39	31.2	8.40	33.7	37.4	-	70.8	-	-	-	-	-	-	-
2026 Cifar100 2024	165	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	166	SAT	1.12	2.05	-	5.70	-	-	4.05	0.96	1.28	-	-	-	-	-
2026 Cifar100 2024	167	UNSAT	23.0	22.3	7.42	48.9	38.5	-	69.6	-	-	-	-	-	-	-
2026 Cifar100 2024	168	UNSAT	2.73	16.0	5.41	23.3	36.4	-	68.5	-	-	-	-	-	-	-
2026 Cifar100 2024	169	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	170	UNSAT	23.1	23.0	11.0	54.6	37.3	-	68.5	-	-	-	-	-	-	-
2026 Cifar100 2024	171	UNSAT	25.1	34.6	-	64.6	63.8	-	84.0	-	-	-	-	-	-	-
2026 Cifar100 2024	172	UNSAT	24.0	24.5	-	83.3	56.0	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	173	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	174	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	175	?	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	176	UNSAT	24.7	25.9	14.2	74.1	38.1	-	69.1	-	-	-	-	-	-	-
2026 Cifar100 2024	177	UNSAT	27.9	33.5	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	178	UNSAT	24.5	30.7	-	-	-	-	89.1	-	-	-	-	-	-	-
2026 Cifar100 2024	179	UNSAT	24.0	24.3	66.4	79.7	43.3	-	72.3	-	-	-	-	-	-	-
2026 Cifar100 2024	180	UNSAT	15.2	32.5	25.5	-	44.6	-	77.1	-	-	-	-	-	-	-
2026 Cifar100 2024	181	UNSAT	24.5	24.1	21.0	65.5	38.5	-	69.6	-	-	-	-	-	-	-
2026 Cifar100 2024	182	UNSAT	23.9	28.8	8.85	63.4	39.6	-	69.6	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Cifar100 2024	183	UNSAT	2.72	13.3	5.79	23.1	36.0	-	63.7	-	-	-	-	-	-
2026 Cifar100 2024	184	SAT	1.17	2.23	-	6.60	-	-	4.20	1.10	1.83	-	-	-	-
2026 Cifar100 2024	185	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	186	UNSAT	25.3	31.6	-	79.1	41.7	-	74.2	-	-	-	-	-	-
2026 Cifar100 2024	187	SAT	1.13	2.04	2.15	5.62	14.3	-	4.07	0.73	0.57	-	-	-	-
2026 Cifar100 2024	188	UNSAT	2.87	16.5	6.70	31.6	36.4	-	64.5	-	-	-	-	-	-
2026 Cifar100 2024	189	UNSAT	26.7	30.7	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	190	UNSAT	23.8	23.5	8.61	61.9	36.9	-	69.5	-	-	-	-	-	-
2026 Cifar100 2024	191	SAT	1.18	2.13	2.11	5.92	-	-	4.07	0.87	1.11	-	-	-	-
2026 Cifar100 2024	192	UNSAT	23.3	23.3	-	57.8	63.0	-	-	-	-	-	-	-	-
2026 Cifar100 2024	193	UNSAT	24.4	29.4	10.4	71.6	36.6	-	68.5	-	-	-	-	-	-
2026 Cifar100 2024	194	UNSAT	24.9	30.6	13.9	55.8	38.8	-	69.9	-	-	-	-	-	-
2026 Cifar100 2024	195	UNSAT	24.8	30.2	-	-	-	-	96.1	-	-	-	-	-	-
2026 Cifar100 2024	196	UNSAT	25.2	28.5	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	197	SAT	1.17	2.15	2.21	6.04	-	-	4.07	0.96	1.60	-	-	-	-
2026 Cifar100 2024	198	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cifar100 2024	199	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Collins Rul Cnn 2022	0	UNSAT	0.95	0.88	0.44	3.89	12.7	0.62	-	1.04	-	-	1.55	-	-
2026 Collins Rul Cnn 2022	1	UNSAT	0.94	0.86	0.32	4.07	8.59	0.41	-	1.34	-	-	0.08	-	-
2026 Collins Rul Cnn 2022	2	UNSAT	0.96	0.88	0.35	7.08	8.49	0.41	-	1.30	-	-	0.08	-	-
2026 Collins Rul Cnn 2022	3	UNSAT	0.97	0.88	0.33	7.13	8.66	0.41	-	1.33	-	-	0.07	-	-
2026 Collins Rul Cnn 2022	4	UNSAT	0.95	0.88	0.35	7.06	8.61	0.41	-	1.05	-	-	0.10	-	-
2026 Collins Rul Cnn 2022	5	UNSAT	0.95	0.87	0.39	7.06	8.58	0.42	-	1.06	-	-	0.10	-	-
2026 Collins Rul Cnn 2022	6	UNSAT	0.97	0.87	0.41	11.1	8.98	0.21	-	1.04	-	-	0.09	-	-
2026 Collins Rul Cnn 2022	7	UNSAT	0.96	0.88	0.36	11.1	8.94	0.41	-	1.19	-	-	0.10	-	-
2026 Collins Rul Cnn 2022	8	UNSAT	0.96	0.86	0.29	11.1	8.51	0.41	-	1.10	-	-	0.09	-	-
2026 Collins Rul Cnn 2022	9	SAT	0.30	1.13	0.08	0.28	4.72	-	-	0.11	-	-	0.08	3.69	✗
2026 Collins Rul Cnn 2022	10	UNSAT	1.00	0.91	0.27	11.1	9.04	0.41	-	1.28	-	-	0.09	-	-
2026 Collins Rul Cnn 2022	11	UNSAT	0.94	0.88	0.30	11.2	9.12	0.41	-	1.24	-	-	0.09	-	-
2026 Collins Rul Cnn 2022	12	UNSAT	0.96	0.86	0.32	11.1	8.56	0.41	-	1.08	-	-	0.08	-	-
2026 Collins Rul Cnn 2022	13	UNSAT	0.96	0.87	0.32	11.1	9.41	0.41	-	1.04	-	-	0.11	-	-
2026 Collins Rul Cnn 2022	14	UNSAT	0.96	0.88	0.32	11.1	9.56	0.41	-	1.08	-	-	0.10	-	-
2026 Collins Rul Cnn 2022	15	SAT	0.30	1.13	0.10	0.27	4.85	-	-	0.11	-	-	0.10	3.68	✗
2026 Collins Rul Cnn 2022	16	SAT	0.29	1.13	0.16	0.28	4.95	-	-	0.08	-	-	0.59	3.61	✗
2026 Collins Rul Cnn 2022	17	SAT	0.29	1.13	0.08	0.26	4.91	-	-	0.11	-	-	0.48	3.60	✗
2026 Collins Rul Cnn 2022	18	UNSAT	0.96	0.87	0.34	11.1	9.10	0.41	-	1.28	-	-	0.50	-	-
2026 Collins Rul Cnn 2022	19	SAT	0.42	1.14	0.07	0.26	6.44	-	-	0.09	-	-	0.51	3.70	✗
2026 Collins Rul Cnn 2022	20	SAT	0.29	1.12	0.13	0.28	4.68	-	-	0.11	-	-	0.57	3.70	✗
2026 Collins Rul Cnn 2022	21	SAT	0.42	1.13	0.09	0.27	6.40	-	-	0.12	-	-	1.12	3.68	✗
2026 Collins Rul Cnn 2022	22	UNSAT	0.96	0.88	0.31	4.11	12.6	0.41	-	1.29	-	-	0.47	-	-
2026 Collins Rul Cnn 2022	23	UNSAT	0.99	0.87	0.30	4.07	8.74	0.41	-	1.11	-	-	0.52	-	-
2026 Collins Rul Cnn 2022	24	UNSAT	0.96	0.89	0.31	7.09	8.71	0.41	-	1.08	-	-	0.42	-	-
2026 Collins Rul Cnn 2022	25	UNSAT	0.96	0.88	0.31	11.1	8.92	0.41	-	1.11	-	-	0.42	-	-
2026 Collins Rul Cnn 2022	26	UNSAT	0.93	0.88	0.34	7.08	9.07	0.41	-	1.31	-	-	0.46	-	-
2026 Collins Rul Cnn 2022	27	UNSAT	0.97	0.89	0.30	7.08	8.92	0.42	-	1.08	-	-	0.45	-	-
2026 Collins Rul Cnn 2022	28	UNSAT	0.95	0.88	0.34	11.1	9.03	0.41	-	1.12	-	-	0.43	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Collins Rul Cnn 2022	29	UNSAT	0.96	0.92	0.33	11.1	9.36	0.41	-	1.09	-	-	0.47	-	-
2026 Collins Rul Cnn 2022	30	UNSAT	0.96	0.88	0.30	11.1	8.53	0.41	-	1.10	-	-	0.43	-	-
2026 Collins Rul Cnn 2022	31	SAT	0.29	1.13	0.09	0.27	4.71	-	-	0.11	-	-	0.43	3.83	✗
2026 Collins Rul Cnn 2022	32	UNSAT	0.97	0.91	0.34	11.1	9.29	0.41	-	1.18	-	-	0.48	-	-
2026 Collins Rul Cnn 2022	33	UNSAT	0.98	0.92	0.33	11.1	9.34	0.41	-	1.13	-	-	0.48	-	-
2026 Collins Rul Cnn 2022	34	UNSAT	0.96	0.93	0.30	11.1	9.18	0.41	-	1.11	-	-	0.45	-	-
2026 Collins Rul Cnn 2022	35	UNSAT	1.00	0.92	0.31	11.1	9.97	0.41	-	1.12	-	-	0.48	-	-
2026 Collins Rul Cnn 2022	36	UNSAT	0.96	0.93	0.33	11.1	10.2	0.41	-	1.16	-	-	0.52	-	-
2026 Collins Rul Cnn 2022	37	SAT	0.29	1.13	0.10	0.24	4.99	-	-	0.10	-	-	0.40	3.80	✗
2026 Collins Rul Cnn 2022	38	SAT	0.29	1.13	0.07	0.28	4.91	-	-	0.10	-	-	0.41	3.93	✗
2026 Collins Rul Cnn 2022	39	UNSAT	0.97	0.93	0.33	11.1	9.31	0.41	-	1.34	-	-	0.47	-	-
2026 Collins Rul Cnn 2022	40	UNSAT	0.98	0.91	0.34	11.1	9.58	0.41	-	1.08	-	-	0.43	-	-
2026 Collins Rul Cnn 2022	41	SAT	0.29	1.14	0.08	0.28	4.70	-	-	0.08	-	-	0.52	3.81	✗
2026 Collins Rul Cnn 2022	42	SAT	0.44	1.14	0.13	0.27	6.27	-	-	0.11	-	-	0.54	3.86	✗
2026 Collins Rul Cnn 2022	43	UNSAT	0.98	0.87	0.54	7.21	12.9	0.41	-	1.40	-	-	0.43	-	-
2026 Collins Rul Cnn 2022	44	SAT	0.29	1.14	0.11	0.45	4.76	-	-	0.15	-	-	0.62	5.49	✗
2026 Collins Rul Cnn 2022	45	UNSAT	0.98	0.89	0.54	11.3	8.45	0.41	-	1.39	-	-	0.48	-	-
2026 Collins Rul Cnn 2022	46	UNSAT	0.98	0.89	0.55	11.3	9.48	0.41	-	1.39	-	-	0.53	-	-
2026 Collins Rul Cnn 2022	47	UNSAT	0.98	0.89	0.56	11.3	7.99	0.41	-	1.61	-	-	0.48	-	-
2026 Collins Rul Cnn 2022	48	UNSAT	1.02	0.89	0.58	11.3	8.08	0.41	-	1.52	-	-	0.49	-	-
2026 Collins Rul Cnn 2022	49	UNSAT	1.01	0.90	0.59	11.3	9.42	0.41	-	1.58	-	-	0.49	-	-
2026 Collins Rul Cnn 2022	50	UNSAT	1.02	0.90	0.65	11.3	9.43	0.41	-	1.39	-	-	0.69	-	-
2026 Collins Rul Cnn 2022	51	UNSAT	0.98	0.90	0.59	11.2	8.10	0.41	-	1.34	-	-	0.85	-	-
2026 Collins Rul Cnn 2022	52	SAT	0.30	1.14	0.13	0.44	5.16	-	-	0.13	-	-	0.48	5.42	✗
2026 Collins Rul Cnn 2022	53	SAT	0.31	1.14	0.10	0.45	5.09	-	-	0.14	-	-	0.43	5.63	✗
2026 Collins Rul Cnn 2022	54	SAT	0.31	1.14	0.12	0.46	4.87	-	-	0.15	-	-	2.20	5.86	✗
2026 Collins Rul Cnn 2022	55	UNSAT	1.01	0.94	0.56	11.3	8.72	0.41	-	1.58	-	-	0.43	-	-
2026 Collins Rul Cnn 2022	56	UNSAT	0.98	0.92	0.64	11.3	8.55	0.41	-	1.54	-	-	0.53	-	-
2026 Collins Rul Cnn 2022	57	SAT	0.30	1.15	0.14	0.43	4.76	-	-	0.30	-	-	0.42	5.56	✗
2026 Collins Rul Cnn 2022	58	UNSAT	0.98	0.94	1.34	11.3	11.9	20.1	-	2.02	-	-	2.48	994	-
2026 Collins Rul Cnn 2022	59	UNSAT	0.99	0.92	0.63	11.2	9.79	0.41	-	1.80	-	-	0.63	-	-
2026 Collins Rul Cnn 2022	60	UNSAT	1.02	0.92	0.60	11.3	9.76	0.41	-	1.59	-	-	0.53	-	-
2026 Collins Rul Cnn 2022	61	UNSAT	0.98	0.93	0.61	11.3	9.43	0.41	-	1.62	-	-	0.61	-	-
2026 Cora 2024	0	SAT	0.26	1.09	0.84	1.06	11.7	0.62	1.27	0.16	0.20	-	-	-	✗
2026 Cora 2024	1	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	2	UNSAT	1.06	3.43	2.93	4.09	-	0.21	2.94	11.7	18.2	-	0.79	-	-
2026 Cora 2024	3	SAT	0.26	1.07	0.89	1.04	11.4	0.41	1.25	0.16	0.19	-	-	-	-
2026 Cora 2024	4	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	5	UNSAT	1.06	3.16	2.24	4.10	-	0.21	2.93	1.95	18.3	-	0.88	-	-
2026 Cora 2024	6	SAT	0.25	1.08	0.82	1.01	-	-	1.25	0.30	0.22	-	-	-	-
2026 Cora 2024	7	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	8	UNSAT	1.07	3.25	2.31	4.08	-	0.21	2.96	1.79	18.2	-	0.76	-	-
2026 Cora 2024	9	SAT	0.26	1.09	0.82	1.01	-	-	1.24	0.17	0.21	-	-	-	-
2026 Cora 2024	10	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	11	UNSAT	1.05	3.17	2.21	4.10	-	0.21	2.93	1.31	18.4	-	0.89	-	-
2026 Cora 2024	12	SAT	0.26	1.09	0.82	0.99	11.6	0.41	1.23	0.15	0.20	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Cora 2024	13	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	14	UNSAT	1.06	3.42	2.95	4.07	-	0.21	2.94	5.80	18.5	-	0.81	-	-
2026 Cora 2024	15	SAT	0.26	1.09	0.80	1.00	11.0	0.41	1.24	0.31	0.17	-	-	-	-
2026 Cora 2024	16	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	17	UNSAT	1.07	3.14	2.21	4.15	-	0.21	2.93	1.42	19.1	-	1.17	-	-
2026 Cora 2024	18	SAT	0.26	1.08	0.80	1.01	9.56	0.41	1.25	0.31	0.82	-	-	-	-
2026 Cora 2024	19	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	20	UNSAT	1.08	3.37	2.71	4.08	-	0.21	2.95	3.57	18.4	-	0.88	-	-
2026 Cora 2024	21	SAT	0.27	1.09	0.79	1.00	10.5	0.41	1.24	0.17	0.19	-	-	-	-
2026 Cora 2024	22	SAT	0.28	1.08	0.88	1.30	-	-	1.23	0.20	0.72	-	-	-	-
2026 Cora 2024	23	UNSAT	1.91	10.5	7.40	20.1	-	-	-	-	-	-	-	-	-
2026 Cora 2024	24	SAT	0.27	1.10	0.78	1.03	8.77	0.41	1.24	0.14	0.16	-	-	-	✗
2026 Cora 2024	25	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	26	UNSAT	1.07	3.19	2.22	4.08	-	0.21	2.94	2.35	18.2	-	0.81	-	-
2026 Cora 2024	27	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	28	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	29	UNSAT	1.08	3.21	2.20	4.07	-	0.21	2.93	2.00	18.1	-	0.81	-	-
2026 Cora 2024	30	SAT	0.27	1.11	0.80	1.01	-	0.41	1.24	0.32	0.20	-	-	-	-
2026 Cora 2024	31	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	32	UNSAT	1.07	3.22	2.56	4.08	-	0.21	2.95	2.68	18.4	19.3	0.91	-	-
2026 Cora 2024	33	SAT	0.26	1.09	0.81	1.02	11.2	0.41	1.23	0.16	0.19	-	-	-	-
2026 Cora 2024	34	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	35	UNSAT	1.08	3.45	2.72	4.09	-	0.21	2.95	7.58	18.3	-	0.80	-	-
2026 Cora 2024	36	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	37	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	38	UNSAT	1.06	3.45	2.85	4.05	-	0.21	2.93	3.09	18.1	19.4	0.93	-	-
2026 Cora 2024	39	SAT	0.26	1.09	0.80	1.02	-	0.41	1.23	0.15	0.22	-	-	-	-
2026 Cora 2024	40	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	41	UNSAT	1.08	3.18	2.17	4.06	-	0.21	2.93	1.74	18.4	-	0.87	-	-
2026 Cora 2024	42	SAT	0.27	1.09	0.77	1.03	11.6	0.41	1.25	0.32	0.20	-	-	-	-
2026 Cora 2024	43	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	44	UNSAT	1.07	3.42	2.86	4.09	-	0.21	2.93	16.1	18.4	-	0.82	-	-
2026 Cora 2024	45	SAT	0.26	1.09	0.81	1.02	11.0	0.41	1.22	0.16	0.18	-	-	-	-
2026 Cora 2024	46	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	47	UNSAT	1.07	3.16	2.19	4.06	-	0.21	2.91	4.52	18.6	-	1.04	-	-
2026 Cora 2024	48	SAT	0.27	1.08	0.77	1.00	7.98	0.41	1.25	0.16	0.15	-	-	-	✗
2026 Cora 2024	49	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	50	UNSAT	1.08	3.28	2.49	4.10	-	0.21	2.93	3.28	18.3	-	0.85	-	-
2026 Cora 2024	51	SAT	0.28	1.07	0.74	1.00	8.56	0.41	1.25	0.13	0.14	-	-	-	✗
2026 Cora 2024	52	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	53	UNSAT	1.06	3.27	2.51	4.11	-	0.21	2.95	5.20	18.4	-	0.80	-	-
2026 Cora 2024	54	SAT	0.26	1.09	0.75	1.01	-	-	1.24	0.15	0.21	-	-	-	-
2026 Cora 2024	55	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	56	UNSAT	1.05	3.18	2.22	4.07	-	0.21	2.93	1.19	18.2	-	0.94	-	-
2026 Cora 2024	57	SAT	0.23	1.08	0.76	1.03	8.39	0.41	1.25	0.33	0.15	-	-	-	✗
2026 Cora 2024	58	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	59	UNSAT	1.08	3.19	2.14	4.13	-	0.21	2.94	2.31	18.2	-	0.80	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Cora 2024	60	SAT	0.26	1.29	0.76	1.45	11.9	0.62	2.75	0.31	0.21	-	-	-	✗
2026 Cora 2024	61	SAT	0.25	1.15	0.82	0.90	10.6	0.62	2.75	0.32	0.24	-	-	-	✗
2026 Cora 2024	62	SAT	0.29	1.14	0.81	1.47	10.8	0.41	2.74	0.32	0.21	-	-	-	✗
2026 Cora 2024	63	SAT	0.26	1.13	0.83	0.71	6.57	0.62	2.75	0.30	0.18	-	-	-	✗
2026 Cora 2024	64	SAT	0.26	1.13	0.79	0.65	6.67	0.62	2.75	0.30	0.22	-	-	-	✗
2026 Cora 2024	65	SAT	0.29	1.13	0.83	1.43	8.25	0.62	2.74	0.31	0.19	-	-	-	✗
2026 Cora 2024	66	SAT	0.24	1.11	0.88	0.77	6.82	0.62	2.75	0.28	0.19	-	-	-	✗
2026 Cora 2024	67	SAT	0.27	1.12	0.85	1.44	7.38	0.62	2.74	0.31	0.24	-	-	-	✗
2026 Cora 2024	68	SAT	0.29	1.12	0.82	1.48	7.11	0.62	2.75	0.30	0.20	-	-	-	✗
2026 Cora 2024	69	SAT	0.25	1.11	0.80	0.68	6.62	0.62	2.76	0.30	0.22	-	-	-	✗
2026 Cora 2024	70	SAT	0.21	1.15	0.81	0.72	6.23	0.62	2.74	0.47	0.19	-	-	-	✗
2026 Cora 2024	71	SAT	0.28	1.13	0.85	1.42	6.55	0.62	2.73	0.32	0.18	-	-	-	✗
2026 Cora 2024	72	SAT	0.26	1.16	0.76	0.72	6.60	0.62	2.75	0.56	0.20	-	5.03	-	✗
2026 Cora 2024	73	SAT	0.29	1.13	0.88	1.41	8.06	0.41	2.75	0.33	0.22	-	-	-	✗
2026 Cora 2024	74	SAT	0.29	1.13	0.89	1.42	7.01	0.41	2.72	0.30	0.21	-	-	-	✗
2026 Cora 2024	75	SAT	0.24	1.11	0.84	0.77	7.79	0.62	2.74	0.27	0.20	-	-	-	✗
2026 Cora 2024	76	SAT	0.28	1.13	0.84	1.42	6.56	0.62	2.78	0.31	0.19	-	-	-	✗
2026 Cora 2024	77	SAT	0.29	1.14	0.79	1.42	7.33	0.62	2.74	0.27	0.19	-	-	-	-
2026 Cora 2024	78	SAT	0.24	1.14	0.84	0.75	5.98	0.62	2.74	0.26	0.18	-	-	-	✗
2026 Cora 2024	79	SAT	0.24	1.12	0.83	0.67	6.61	0.62	2.74	0.31	0.19	-	-	-	✗
2026 Cora 2024	80	SAT	0.24	1.14	0.82	0.99	6.58	0.62	2.75	0.30	0.20	-	-	-	✗
2026 Cora 2024	81	SAT	0.25	1.13	0.82	1.44	6.60	0.62	2.76	0.31	0.20	-	-	-	✗
2026 Cora 2024	82	SAT	0.29	1.14	0.84	1.46	6.60	0.62	2.76	0.31	0.19	-	-	-	✗
2026 Cora 2024	83	SAT	0.30	1.14	0.80	1.44	6.91	0.62	2.76	0.48	0.19	-	-	-	✗
2026 Cora 2024	84	SAT	0.23	1.14	0.78	0.74	6.08	0.62	2.75	0.32	0.19	-	-	-	✗
2026 Cora 2024	85	SAT	0.23	1.15	0.85	0.69	6.35	0.62	2.74	0.28	0.20	-	-	-	✗
2026 Cora 2024	86	SAT	0.25	1.15	0.84	0.75	7.48	0.62	2.77	0.30	0.18	-	-	-	✗
2026 Cora 2024	87	SAT	0.23	1.15	0.82	0.76	5.99	0.62	2.74	0.29	0.23	-	-	-	✗
2026 Cora 2024	88	SAT	0.25	1.15	0.82	0.72	6.88	0.62	2.78	0.46	0.19	-	-	-	✗
2026 Cora 2024	89	SAT	0.29	1.14	0.79	0.68	6.62	0.62	2.73	0.30	0.19	-	-	-	✗
2026 Cora 2024	90	SAT	0.25	1.14	0.78	0.88	7.99	0.62	2.76	0.31	0.21	-	-	-	✗
2026 Cora 2024	91	SAT	0.28	1.13	0.79	1.42	7.55	0.62	2.74	0.33	0.19	-	-	-	✗
2026 Cora 2024	92	SAT	0.27	1.15	0.81	1.50	7.66	0.41	2.74	0.31	0.19	-	-	-	-
2026 Cora 2024	93	SAT	0.25	1.13	0.81	1.41	6.85	0.62	2.75	0.31	0.20	-	-	-	✗
2026 Cora 2024	94	SAT	0.25	1.14	0.84	0.78	6.61	0.62	2.74	0.25	0.21	-	-	-	✗
2026 Cora 2024	95	SAT	0.25	1.13	0.80	1.41	6.56	0.62	2.75	0.28	0.20	-	-	-	✗
2026 Cora 2024	96	SAT	0.25	1.12	0.85	0.75	6.59	0.62	2.76	0.32	0.19	-	-	-	✗
2026 Cora 2024	97	SAT	0.25	1.12	0.82	0.67	8.19	0.62	2.75	0.29	0.19	-	-	-	✗
2026 Cora 2024	98	SAT	0.29	1.13	0.83	1.44	8.39	0.62	2.77	0.31	0.20	-	-	-	✗
2026 Cora 2024	99	SAT	0.26	1.14	0.81	0.68	6.57	0.62	2.73	0.47	0.20	-	-	-	✗
2026 Cora 2024	100	SAT	0.28	1.14	0.87	1.40	6.73	0.62	2.74	0.30	0.22	-	-	-	✗
2026 Cora 2024	101	SAT	0.25	1.15	0.79	0.68	6.54	0.62	2.72	0.26	0.19	-	-	-	✗
2026 Cora 2024	102	SAT	0.23	1.13	0.79	0.69	6.18	0.41	2.71	0.30	0.18	-	-	-	✗
2026 Cora 2024	103	SAT	0.25	1.12	0.80	0.69	6.60	0.62	2.75	0.49	0.19	-	-	-	✗
2026 Cora 2024	104	SAT	0.25	1.13	0.86	0.70	6.54	0.41	2.74	0.29	0.20	-	-	-	✗
2026 Cora 2024	105	SAT	0.24	1.14	0.80	0.69	6.57	0.62	2.73	0.29	0.23	-	-	-	✗
2026 Cora 2024	106	SAT	0.25	1.14	0.83	0.95	8.11	0.62	2.74	0.47	0.19	-	-	-	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Cora 2024	107	SAT	0.29	1.13	0.84	1.43	8.63	0.41	2.74	0.30	0.18	19.5	-	-	✗
2026 Cora 2024	108	SAT	0.27	1.17	0.91	0.72	6.62	0.62	2.75	0.47	0.20	-	-	-	✗
2026 Cora 2024	109	SAT	0.24	1.14	0.87	1.44	6.63	0.62	2.76	0.44	0.17	-	-	-	✗
2026 Cora 2024	110	SAT	0.27	1.13	0.84	1.44	7.39	0.62	2.74	0.31	0.18	-	-	-	✗
2026 Cora 2024	111	SAT	0.25	1.14	0.88	0.95	6.89	0.62	2.75	0.29	0.17	-	-	-	✗
2026 Cora 2024	112	SAT	0.25	1.15	0.84	0.68	6.54	0.62	2.74	0.31	0.19	-	-	-	✗
2026 Cora 2024	113	SAT	0.28	1.12	0.88	1.46	6.82	0.62	2.76	0.30	0.19	-	-	-	✗
2026 Cora 2024	114	SAT	0.26	1.14	0.95	1.03	7.51	0.62	2.76	0.29	0.22	-	-	-	✗
2026 Cora 2024	115	SAT	0.28	1.14	0.87	0.86	7.88	0.62	2.75	0.29	0.19	-	-	-	✗
2026 Cora 2024	116	SAT	0.22	1.12	0.88	0.68	6.65	0.41	2.76	0.47	0.19	-	-	-	✗
2026 Cora 2024	117	SAT	0.26	1.14	0.82	0.72	6.89	0.62	2.74	0.30	0.19	-	-	-	✗
2026 Cora 2024	118	SAT	0.26	1.14	0.81	0.79	7.46	0.62	2.74	0.30	0.24	-	-	-	✗
2026 Cora 2024	119	SAT	0.29	1.14	0.87	1.45	7.48	0.62	2.74	0.32	0.19	-	-	-	✗
2026 Cora 2024	120	SAT	0.27	1.14	0.88	1.41	14.3	0.62	2.76	0.33	0.25	-	-	-	✗
2026 Cora 2024	121	SAT	0.28	1.14	0.92	1.43	-	0.62	2.75	0.49	0.27	-	-	-	-
2026 Cora 2024	122	SAT	0.27	1.12	0.88	1.49	15.4	0.62	2.73	0.34	0.23	-	-	-	✗
2026 Cora 2024	123	SAT	0.28	1.12	0.91	1.45	-	0.62	2.78	0.51	0.32	-	-	-	-
2026 Cora 2024	124	SAT	0.29	1.11	0.96	1.43	-	0.62	2.73	0.35	0.26	-	-	-	-
2026 Cora 2024	125	SAT	0.29	1.14	0.84	1.46	9.05	0.62	2.73	0.31	0.22	-	-	-	✗
2026 Cora 2024	126	SAT	0.28	1.15	0.81	1.47	8.83	0.62	2.74	0.48	0.22	-	-	-	✗
2026 Cora 2024	127	SAT	0.27	1.12	0.89	1.43	11.2	0.62	2.75	0.33	0.21	-	-	-	✗
2026 Cora 2024	128	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	129	SAT	0.28	1.14	0.88	1.39	-	0.62	2.74	0.32	0.31	-	-	-	-
2026 Cora 2024	130	SAT	0.28	1.14	0.89	1.42	-	0.62	2.74	0.34	0.27	-	-	-	-
2026 Cora 2024	131	UNSAT	1.51	11.1	13.6	21.6	-	-	-	-	-	-	-	-	-
2026 Cora 2024	132	SAT	0.28	1.15	0.84	1.42	8.04	0.62	2.75	0.32	0.19	-	-	-	✗
2026 Cora 2024	133	SAT	0.28	1.13	0.89	1.45	-	0.62	2.75	0.33	0.28	-	-	-	-
2026 Cora 2024	134	UNSAT	1.57	10.3	28.8	23.8	-	-	4.65	-	-	-	-	-	-
2026 Cora 2024	135	SAT	0.28	1.14	0.80	1.42	7.80	0.41	2.73	0.32	0.21	19.4	-	-	✗
2026 Cora 2024	136	SAT	0.28	1.13	0.81	1.43	11.8	0.62	2.74	0.32	0.24	-	-	-	-
2026 Cora 2024	137	SAT	0.28	1.14	0.86	1.53	-	0.62	2.73	0.35	0.24	-	-	-	-
2026 Cora 2024	138	SAT	0.28	1.15	0.82	1.42	8.07	0.62	2.75	0.32	0.20	-	-	-	✗
2026 Cora 2024	139	SAT	0.27	1.14	0.80	1.43	8.00	0.62	2.75	0.47	0.23	-	-	-	✗
2026 Cora 2024	140	SAT	0.25	1.12	0.81	0.78	6.40	0.62	2.74	0.29	0.20	-	-	-	✗
2026 Cora 2024	141	SAT	0.28	1.12	0.82	1.42	11.4	0.62	2.74	0.34	0.29	-	-	-	-
2026 Cora 2024	142	SAT	0.28	1.13	0.83	1.43	-	0.62	2.76	0.34	0.28	-	-	-	-
2026 Cora 2024	143	SAT	0.28	1.11	0.78	1.41	9.21	0.62	2.74	0.28	0.22	-	-	-	✗
2026 Cora 2024	144	SAT	0.29	1.13	0.79	1.42	8.40	0.62	2.72	0.48	0.21	-	-	-	✗
2026 Cora 2024	145	SAT	0.28	1.13	0.79	1.42	7.94	0.41	2.77	0.32	0.20	-	-	-	✗
2026 Cora 2024	146	SAT	0.28	1.13	0.79	1.43	9.25	0.62	2.74	0.31	0.23	-	-	-	✗
2026 Cora 2024	147	SAT	0.27	1.13	-	1.44	-	-	-	-	-	-	-	-	-
2026 Cora 2024	148	SAT	0.27	1.11	0.83	1.46	8.96	0.62	2.75	0.49	0.22	-	-	-	✗
2026 Cora 2024	149	SAT	0.28	1.13	0.79	1.45	-	0.62	2.75	0.32	0.27	19.4	-	-	-
2026 Cora 2024	150	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	151	SAT	0.29	1.13	0.84	1.36	-	0.62	2.75	0.50	0.28	-	-	-	-
2026 Cora 2024	152	UNSAT	1.13	3.53	2.90	4.42	-	0.21	-	-	19.9	-	6.17	-	-
2026 Cora 2024	153	SAT	0.29	1.13	0.81	1.38	11.6	0.62	2.73	0.32	0.24	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Cora 2024	154	SAT	0.27	1.13	0.80	1.42	-	0.62	2.76	0.35	0.26	-	-	-	-
2026 Cora 2024	155	SAT	0.29	1.14	0.79	1.45	7.63	0.41	2.75	0.46	0.19	-	-	-	✗
2026 Cora 2024	156	SAT	0.27	1.13	0.79	1.44	6.89	0.62	2.74	0.46	0.20	-	-	-	✗
2026 Cora 2024	157	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	158	UNSAT	1.13	3.50	2.96	4.33	-	0.21	4.66	-	19.7	-	6.62	-	-
2026 Cora 2024	159	SAT	0.26	1.15	0.83	1.39	-	-	2.75	0.49	0.29	-	-	-	-
2026 Cora 2024	160	SAT	0.27	1.13	0.81	1.43	7.25	0.62	2.74	0.32	0.19	-	-	-	✗
2026 Cora 2024	161	SAT	0.29	1.12	0.81	1.42	9.07	0.62	2.74	0.49	0.21	-	-	-	✗
2026 Cora 2024	162	SAT	0.28	1.13	0.79	1.42	9.12	0.41	2.74	0.31	0.22	-	-	-	✗
2026 Cora 2024	163	SAT	0.28	1.11	0.82	1.43	11.7	0.62	2.74	0.32	0.22	-	-	-	✗
2026 Cora 2024	164	UNSAT	6.11	12.0	-	-	-	-	4.69	-	-	-	-	-	-
2026 Cora 2024	165	SAT	0.28	1.06	0.80	1.42	8.21	0.41	2.74	0.31	0.21	-	-	-	✗
2026 Cora 2024	166	SAT	0.27	1.17	0.83	1.46	-	-	2.74	0.36	0.36	-	-	-	-
2026 Cora 2024	167	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	168	SAT	0.26	1.14	0.79	1.37	11.0	0.62	2.74	0.33	0.24	-	-	-	-
2026 Cora 2024	169	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	170	UNSAT	-	-	-	-	-	-	4.68	-	-	-	-	-	-
2026 Cora 2024	171	SAT	0.27	1.13	0.81	1.38	11.6	0.62	2.74	0.32	0.26	-	-	-	-
2026 Cora 2024	172	SAT	0.27	1.12	0.83	1.44	-	0.62	2.74	0.32	0.34	-	-	-	-
2026 Cora 2024	173	SAT	0.28	1.12	0.86	1.44	-	0.62	2.75	0.50	0.29	-	-	-	-
2026 Cora 2024	174	SAT	0.28	1.12	0.82	1.42	10.5	0.62	2.74	0.42	0.29	-	-	-	✗
2026 Cora 2024	175	SAT	0.29	1.13	0.82	1.45	-	-	2.78	0.45	0.28	-	-	-	-
2026 Cora 2024	176	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Cora 2024	177	SAT	0.29	1.08	0.79	1.38	7.15	0.62	2.76	0.32	0.21	19.4	-	-	✗
2026 Cora 2024	178	SAT	0.28	1.14	0.88	1.44	7.02	0.62	2.74	0.33	0.20	-	-	-	✗
2026 Cora 2024	179	SAT	0.28	1.12	0.78	1.43	8.30	0.41	2.74	0.31	0.22	-	-	-	✗
2026 Dist Shift 2023	0	UNSAT	0.40	1.84	0.21	11.7	43.4	1.23	-	157	8.30	2.31	-	-	-
2026 Dist Shift 2023	1	SAT	0.92	0.92	0.10	0.26	8.77	1.03	-	0.13	0.29	✗	-	4.90	✗
2026 Dist Shift 2023	2	UNSAT	0.40	1.69	0.17	11.5	28.1	0.42	-	75.3	8.03	2.29	-	-	-
2026 Dist Shift 2023	3	UNSAT	0.39	1.63	0.14	11.6	31.2	0.41	-	61.9	8.10	2.31	-	-	-
2026 Dist Shift 2023	4	UNSAT	2.21	1.71	0.22	11.7	-	0.82	-	137	-	2.27	-	-	-
2026 Dist Shift 2023	5	UNSAT	0.38	1.60	0.14	11.7	29.9	0.41	-	28.1	8.19	2.34	-	-	-
2026 Dist Shift 2023	6	UNSAT	0.39	1.67	0.15	11.6	29.0	0.41	-	104	8.11	2.25	-	-	-
2026 Dist Shift 2023	7	UNSAT	0.67	1.79	0.27	11.7	-	0.82	-	62.2	11.9	2.24	-	-	-
2026 Dist Shift 2023	8	UNSAT	0.41	1.75	0.16	11.8	29.7	0.82	-	37.8	8.02	2.18	-	-	-
2026 Dist Shift 2023	9	UNSAT	0.39	1.65	0.15	11.6	28.2	0.41	-	14.9	8.11	2.28	-	-	-
2026 Dist Shift 2023	10	UNSAT	0.39	1.60	0.15	11.6	27.4	0.41	-	81.1	8.09	2.24	-	-	-
2026 Dist Shift 2023	11	SAT	0.87	0.90	0.07	0.97	8.76	0.41	-	0.29	0.34	✗	-	33.9	✗
2026 Dist Shift 2023	12	UNSAT	0.42	1.68	0.17	11.6	28.8	0.41	-	68.3	8.10	2.43	-	-	-
2026 Dist Shift 2023	13	SAT	0.82	0.92	0.09	0.20	5.14	0.62	-	0.13	0.29	2.26	-	4.69	✗
2026 Dist Shift 2023	14	UNSAT	0.40	1.70	0.17	11.7	28.6	0.41	-	107	8.06	2.26	-	-	-
2026 Dist Shift 2023	15	UNSAT	0.40	1.64	0.17	11.7	32.5	0.82	-	42.6	8.07	2.34	-	-	-
2026 Dist Shift 2023	16	UNSAT	2.15	1.73	0.21	11.7	-	0.82	-	134	12.2	2.24	-	-	-
2026 Dist Shift 2023	17	UNSAT	0.39	1.71	0.17	11.7	33.0	0.83	-	57.1	8.12	2.39	-	-	-
2026 Dist Shift 2023	18	UNSAT	0.41	1.65	0.12	11.6	27.9	0.41	-	63.5	8.12	2.27	-	-	-
2026 Dist Shift 2023	19	UNSAT	0.39	1.61	0.13	11.6	27.9	0.41	-	50.2	8.16	2.37	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Dist Shift 2023	20	UNSAT	0.40	1.65	0.21	11.7	31.3	0.82	-	57.7	8.09	2.24	-	-	-
2026 Dist Shift 2023	21	UNSAT	0.67	1.72	0.19	11.8	37.8	0.82	-	155	11.7	2.28	-	-	-
2026 Dist Shift 2023	22	UNSAT	0.39	1.60	0.12	11.6	28.3	0.41	-	40.2	8.09	2.33	-	-	-
2026 Dist Shift 2023	23	UNSAT	2.63	1.97	0.85	11.8	-	1.64	-	176	-	2.30	-	-	-
2026 Dist Shift 2023	24	UNSAT	0.39	1.65	0.11	11.7	27.4	0.41	-	42.9	8.19	2.26	-	-	-
2026 Dist Shift 2023	25	SAT	0.80	0.93	0.11	0.20	5.14	0.62	-	0.14	0.44	✗	-	4.79	✗
2026 Dist Shift 2023	26	UNSAT	0.40	1.72	0.15	11.7	27.1	0.82	-	39.5	8.15	2.17	-	-	-
2026 Dist Shift 2023	27	UNSAT	0.40	1.59	0.19	11.6	27.3	0.41	-	28.5	8.12	2.29	-	-	-
2026 Dist Shift 2023	28	UNSAT	0.40	1.62	0.14	11.6	29.3	0.41	-	34.1	8.21	2.30	-	-	-
2026 Dist Shift 2023	29	UNSAT	0.40	1.64	0.16	11.6	27.8	0.41	-	37.8	8.08	2.34	-	-	-
2026 Dist Shift 2023	30	UNSAT	0.39	1.62	0.13	11.6	27.4	0.41	-	21.7	8.12	2.35	-	-	-
2026 Dist Shift 2023	31	UNSAT	3.05	1.71	0.25	11.7	-	0.82	-	20.9	-	2.29	-	-	-
2026 Dist Shift 2023	32	UNSAT	2.19	1.81	0.37	11.7	-	1.03	-	77.7	-	2.37	-	-	-
2026 Dist Shift 2023	33	UNSAT	0.40	1.66	0.17	11.7	31.4	0.41	-	47.8	7.99	2.27	-	-	-
2026 Dist Shift 2023	34	UNSAT	0.39	1.60	0.15	11.6	26.4	0.41	-	27.2	8.18	2.29	-	-	-
2026 Dist Shift 2023	35	UNSAT	0.41	1.77	0.19	11.7	29.7	0.82	-	45.2	8.25	2.25	-	-	-
2026 Dist Shift 2023	36	UNSAT	0.40	1.66	0.23	11.7	33.1	0.82	-	51.6	8.14	2.19	-	-	-
2026 Dist Shift 2023	37	UNSAT	0.41	1.67	0.18	11.6	61.9	0.41	-	27.8	8.09	2.26	-	-	-
2026 Dist Shift 2023	38	SAT	0.81	0.94	0.09	0.27	5.12	0.82	-	0.14	0.30	✗	-	4.96	✗
2026 Dist Shift 2023	39	UNSAT	0.43	1.71	0.16	11.6	31.6	0.82	-	48.7	8.13	2.25	-	-	-
2026 Dist Shift 2023	40	UNSAT	0.40	1.70	0.15	11.7	27.6	0.41	-	88.0	8.15	2.20	-	-	-
2026 Dist Shift 2023	41	UNSAT	0.40	1.68	0.13	11.7	28.6	0.41	-	37.0	8.10	2.29	-	-	-
2026 Dist Shift 2023	42	UNSAT	0.41	1.72	0.20	11.8	37.6	0.82	-	128	8.02	2.19	-	-	-
2026 Dist Shift 2023	43	SAT	0.80	0.92	0.06	0.97	8.64	0.42	-	0.23	0.29	✗	-	9.63	✗
2026 Dist Shift 2023	44	UNSAT	2.59	2.23	0.55	11.8	-	1.64	-	78.4	-	2.30	-	-	-
2026 Dist Shift 2023	45	UNSAT	2.23	3.33	0.22	11.9	34.6	1.44	-	70.6	12.0	2.28	-	-	-
2026 Dist Shift 2023	46	UNSAT	0.39	1.61	0.15	11.6	30.5	0.41	-	36.3	8.12	2.32	-	-	-
2026 Dist Shift 2023	47	UNSAT	0.41	1.62	0.16	11.6	28.2	0.41	-	41.7	8.12	2.20	-	-	-
2026 Dist Shift 2023	48	UNSAT	0.74	1.62	0.19	11.7	29.1	0.82	-	33.8	11.9	2.28	-	-	-
2026 Dist Shift 2023	49	UNSAT	0.40	1.62	0.17	11.6	27.3	0.41	-	56.7	8.05	2.34	-	-	-
2026 Dist Shift 2023	50	UNSAT	2.19	1.77	0.27	11.8	-	1.03	-	105	-	2.23	-	-	-
2026 Dist Shift 2023	51	UNSAT	0.40	1.66	0.16	11.6	27.8	0.82	-	20.6	8.14	2.35	-	-	-
2026 Dist Shift 2023	52	UNSAT	0.40	1.67	0.21	11.7	30.2	0.82	-	72.5	8.10	2.24	-	-	-
2026 Dist Shift 2023	53	UNSAT	0.40	1.67	0.16	11.7	27.9	0.42	-	35.9	8.13	2.22	-	-	-
2026 Dist Shift 2023	54	UNSAT	0.81	1.69	0.28	11.8	-	1.44	-	93.3	12.0	2.22	-	-	-
2026 Dist Shift 2023	55	SAT	0.88	0.91	0.08	0.27	7.74	0.62	-	0.14	0.34	✗	-	4.84	✗
2026 Dist Shift 2023	56	UNSAT	2.21	1.86	0.47	11.7	-	0.82	-	42.4	12.0	2.32	-	-	-
2026 Dist Shift 2023	57	UNSAT	4.18	3.85	0.83	11.9	-	1.85	-	39.6	-	2.25	-	-	-
2026 Dist Shift 2023	58	UNSAT	3.52	11.3	0.77	12.0	-	2.26	-	67.8	-	2.36	-	-	-
2026 Dist Shift 2023	59	UNSAT	0.82	1.67	0.34	12.0	28.3	1.64	-	58.8	12.0	2.22	-	-	-
2026 Dist Shift 2023	60	UNSAT	0.42	1.64	0.19	11.7	29.8	0.82	-	47.5	8.12	2.27	-	-	-
2026 Dist Shift 2023	61	UNSAT	3.48	1.80	0.39	11.8	-	1.43	-	54.1	-	2.25	-	-	-
2026 Dist Shift 2023	62	UNSAT	0.40	1.63	0.21	11.6	27.9	0.41	-	39.0	8.11	2.20	-	-	-
2026 Dist Shift 2023	63	UNSAT	6.92	6.91	6.16	12.2	-	4.72	-	251	-	2.45	-	-	-
2026 Dist Shift 2023	64	UNSAT	0.40	1.64	0.17	11.7	28.2	0.41	-	123	8.13	2.28	-	-	-
2026 Dist Shift 2023	65	UNSAT	0.41	1.66	0.18	11.7	28.4	0.82	-	28.5	8.11	2.30	-	-	-
2026 Dist Shift 2023	66	UNSAT	2.23	4.13	0.28	11.8	-	1.03	-	46.9	-	2.25	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Dist Shift 2023	67	UNSAT	0.40	1.62	0.15	11.6	28.3	0.41	-	131	8.17	2.32	-	-	-
2026 Dist Shift 2023	68	SAT	0.89	0.93	0.12	0.25	7.26	0.62	-	0.17	0.31	✗	-	4.70	✗
2026 Dist Shift 2023	69	UNSAT	0.39	1.77	0.64	11.7	33.4	2.05	-	49.2	8.05	2.25	-	-	-
2026 Dist Shift 2023	70	UNSAT	0.39	1.60	0.15	11.7	29.0	0.41	-	57.0	8.16	2.24	-	-	-
2026 Dist Shift 2023	71	UNSAT	0.39	1.60	0.14	11.6	28.5	0.41	-	76.2	8.13	2.25	-	-	-
2026 Linearizenn 2024	0	SAT	0.54	1.17	0.12	3.04	4.17	1.03	0.91	0.47	8.79	-	0.92	0.26	✗
2026 Linearizenn 2024	1	UNSAT	0.51	1.98	0.25	11.1	4.19	1.03	20.6	-	10.6	-	0.38	34.4	-
2026 Linearizenn 2024	2	UNSAT	0.51	1.90	0.22	11.1	4.03	0.82	17.9	-	10.6	-	0.23	34.5	-
2026 Linearizenn 2024	3	UNSAT	0.51	1.83	0.26	11.1	4.18	1.03	17.9	-	10.6	-	0.31	35.0	-
2026 Linearizenn 2024	4	UNSAT	0.51	1.85	0.18	11.1	4.26	0.82	18.1	-	10.7	-	0.24	34.4	-
2026 Linearizenn 2024	5	UNSAT	1.87	1.86	0.26	11.7	4.73	1.03	17.9	-	17.1	-	0.35	34.9	-
2026 Linearizenn 2024	6	UNSAT	2.19	1.94	0.65	11.9	5.53	3.49	35.8	21.1	-	-	3.17	34.5	-
2026 Linearizenn 2024	7	UNSAT	0.51	1.90	0.25	11.1	4.00	1.44	18.0	9.70	11.0	-	1.24	34.3	-
2026 Linearizenn 2024	8	UNSAT	0.52	1.94	0.29	11.1	4.21	1.44	17.9	10.7	11.0	-	3.34	34.6	-
2026 Linearizenn 2024	9	UNSAT	1.99	1.96	0.44	11.8	4.65	1.85	24.4	13.0	19.3	-	4.44	34.5	-
2026 Linearizenn 2024	10	UNSAT	0.51	1.82	0.21	11.1	4.33	0.62	18.0	8.10	10.6	-	2.08	34.9	-
2026 Linearizenn 2024	11	UNSAT	0.51	1.86	0.25	11.1	4.00	1.03	17.9	9.21	10.6	-	2.76	34.4	-
2026 Linearizenn 2024	12	UNSAT	2.47	1.97	0.88	11.9	6.08	3.69	28.2	128	-	-	63.5	34.7	-
2026 Linearizenn 2024	13	UNSAT	2.04	1.91	0.44	11.8	5.16	2.05	25.5	41.2	-	-	18.6	34.3	-
2026 Linearizenn 2024	14	UNSAT	2.13	1.99	0.55	11.9	5.83	2.26	26.3	70.9	-	-	34.2	34.7	-
2026 Linearizenn 2024	15	UNSAT	2.12	2.01	0.60	12.0	5.63	2.46	26.8	83.0	-	-	41.4	34.9	-
2026 Linearizenn 2024	16	UNSAT	2.11	1.90	0.51	12.0	5.47	2.26	26.6	53.2	-	-	26.0	34.7	-
2026 Linearizenn 2024	17	UNSAT	2.13	1.92	0.56	11.8	5.21	2.26	25.8	67.1	-	-	29.3	34.3	-
2026 Linearizenn 2024	18	UNSAT	2.54	2.04	0.90	12.0	6.17	4.10	37.8	57.5	-	-	25.5	34.2	-
2026 Linearizenn 2024	19	UNSAT	2.11	1.97	0.56	11.8	5.52	2.46	29.2	27.6	-	-	12.6	34.7	-
2026 Linearizenn 2024	20	UNSAT	2.07	1.90	0.53	11.8	5.35	2.67	20.4	20.4	-	-	10.1	34.9	-
2026 Linearizenn 2024	21	UNSAT	2.15	1.95	0.50	11.8	5.48	2.46	29.6	24.0	-	-	10.7	34.6	-
2026 Linearizenn 2024	22	UNSAT	2.16	1.98	0.54	11.8	5.54	2.67	29.1	27.5	-	-	12.8	34.9	-
2026 Linearizenn 2024	23	UNSAT	2.16	1.99	0.62	11.8	5.60	2.67	32.6	28.2	-	-	14.5	34.5	-
2026 Linearizenn 2024	24	UNSAT	2.56	1.93	1.15	12.2	7.09	4.10	47.0	134	-	-	64.0	34.1	-
2026 Linearizenn 2024	25	UNSAT	2.31	1.99	0.77	12.0	6.18	3.49	34.3	63.5	-	-	29.0	34.9	-
2026 Linearizenn 2024	26	UNSAT	1.92	2.00	0.55	12.0	5.14	2.87	23.4	26.3	-	-	10.8	34.2	-
2026 Linearizenn 2024	27	UNSAT	2.30	1.96	0.73	12.0	5.93	3.28	30.1	52.1	-	-	25.5	35.1	-
2026 Linearizenn 2024	28	UNSAT	2.44	1.97	0.91	12.1	6.68	3.49	39.9	80.3	-	-	40.2	34.4	-
2026 Linearizenn 2024	29	UNSAT	2.27	2.00	0.75	12.0	5.67	3.28	34.3	56.5	-	-	24.4	34.4	-
2026 Linearizenn 2024	30	UNSAT	2.58	2.04	1.58	13.3	7.41	5.12	52.6	-	-	-	146	34.4	-
2026 Linearizenn 2024	31	UNSAT	2.21	1.97	0.85	13.1	5.87	3.08	39.3	80.8	-	-	35.3	34.3	-
2026 Linearizenn 2024	32	UNSAT	2.42	2.04	1.22	13.3	8.09	4.72	44.8	190	-	-	94.3	34.3	-
2026 Linearizenn 2024	33	UNSAT	2.19	1.97	0.79	13.1	5.96	3.08	36.0	90.1	-	-	40.6	34.4	-
2026 Linearizenn 2024	34	UNSAT	2.32	1.96	0.83	13.0	6.46	3.08	40.2	127	-	-	55.6	34.6	-
2026 Linearizenn 2024	35	UNSAT	2.35	2.01	1.00	13.2	6.67	3.49	42.9	145	-	-	62.8	34.6	-
2026 Linearizenn 2024	36	UNSAT	2.45	2.02	0.93	12.1	6.25	3.69	39.0	187	-	-	75.6	34.2	-
2026 Linearizenn 2024	37	UNSAT	2.21	1.93	0.73	12.0	5.60	2.46	36.4	90.8	-	-	37.2	34.7	-
2026 Linearizenn 2024	38	UNSAT	2.11	1.95	0.51	11.9	5.45	2.26	29.9	52.2	-	-	20.2	34.9	-
2026 Linearizenn 2024	39	UNSAT	2.09	1.98	0.53	12.0	5.33	2.25	29.8	54.7	-	-	21.8	34.3	-
2026 Linearizenn 2024	40	UNSAT	2.12	1.92	0.53	12.1	5.39	2.46	26.8	40.9	-	-	16.7	34.5	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Linearizenn 2024	41	UNSAT	2.18	1.91	0.55	12.0	5.46	2.46	33.1	77.6	-	-	31.1	34.2	-
2026 Linearizenn 2024	42	UNSAT	2.64	2.03	1.10	11.9	6.69	4.51	28.4	133	-	-	63.6	34.3	-
2026 Linearizenn 2024	43	UNSAT	2.17	1.99	0.71	11.9	5.40	2.87	26.5	55.7	-	-	30.8	34.4	-
2026 Linearizenn 2024	44	UNSAT	2.38	1.94	0.80	11.9	6.09	3.07	26.6	92.2	-	-	47.1	34.1	-
2026 Linearizenn 2024	45	UNSAT	2.14	1.91	0.58	11.9	5.80	2.26	26.9	48.3	-	-	25.6	34.5	-
2026 Linearizenn 2024	46	UNSAT	2.24	1.99	0.68	11.9	5.62	2.67	26.4	52.0	-	-	26.9	34.6	-
2026 Linearizenn 2024	47	UNSAT	2.15	1.96	0.65	12.0	5.79	2.87	26.9	50.8	-	-	29.1	34.4	-
2026 Linearizenn 2024	48	UNSAT	2.23	1.94	0.80	12.0	6.11	3.29	31.8	105	-	-	41.5	34.8	-
2026 Linearizenn 2024	49	UNSAT	2.12	1.91	0.50	11.9	5.52	2.26	34.5	40.9	-	-	18.1	34.9	-
2026 Linearizenn 2024	50	UNSAT	2.15	1.98	0.53	11.9	5.61	2.25	31.0	44.2	-	-	16.8	34.7	-
2026 Linearizenn 2024	51	UNSAT	2.15	1.98	0.48	11.9	5.48	2.26	31.0	33.7	-	-	12.1	34.4	-
2026 Linearizenn 2024	52	UNSAT	2.19	1.90	0.61	12.0	5.61	2.26	29.9	57.2	-	-	25.5	35.1	-
2026 Linearizenn 2024	53	UNSAT	2.20	1.90	0.57	12.0	5.24	2.26	30.8	55.1	-	-	21.0	34.6	-
2026 Linearizenn 2024	54	UNSAT	2.07	1.92	0.51	11.8	5.08	2.46	26.0	12.8	-	-	3.98	34.3	-
2026 Linearizenn 2024	55	UNSAT	0.52	1.92	0.26	11.1	4.01	0.62	17.9	7.13	10.5	-	1.77	34.4	-
2026 Linearizenn 2024	56	UNSAT	0.49	1.91	0.19	10.9	4.11	0.62	17.9	7.69	10.8	-	1.97	34.4	-
2026 Linearizenn 2024	57	UNSAT	1.80	1.89	0.31	11.7	4.94	1.44	26.2	8.24	15.4	-	4.01	34.4	-
2026 Linearizenn 2024	58	UNSAT	1.78	1.87	0.33	11.7	4.96	1.44	25.2	8.24	15.5	-	2.49	35.3	-
2026 Linearizenn 2024	59	UNSAT	1.98	1.88	0.27	11.7	4.97	1.44	25.9	8.83	-	-	2.21	35.0	-
2026 Lsnc Relu	0	SAT	0.27	2.23	0.88	-	15.1	-	-	-	-	-	-	-	✗
2026 Lsnc Relu	1	SAT	0.27	1.66	0.94	-	6.70	-	-	-	-	-	-	-	✗
2026 Lsnc Relu	2	UNSAT	13.3	9.90	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	3	UNSAT	13.2	9.66	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	4	UNSAT	13.1	9.73	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	5	UNSAT	14.6	10.7	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	6	UNSAT	15.4	11.2	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	7	UNSAT	13.9	10.2	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	8	UNSAT	15.4	11.2	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	9	UNSAT	13.1	9.63	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	10	UNSAT	12.9	9.42	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	11	UNSAT	12.9	9.54	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	12	UNSAT	12.9	9.65	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	13	UNSAT	13.2	9.73	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	14	SAT	0.31	5.69	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	15	UNSAT	13.0	9.42	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	16	UNSAT	13.8	10.2	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	17	SAT	0.31	5.81	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	18	SAT	0.28	1.73	1.01	-	6.77	-	-	-	-	-	-	-	✗
2026 Lsnc Relu	19	UNSAT	13.9	10.3	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	20	UNSAT	12.8	9.53	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	21	UNSAT	15.2	11.3	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	22	UNSAT	14.6	10.5	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	23	UNSAT	16.0	11.6	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	24	UNSAT	13.4	9.76	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	25	UNSAT	13.3	9.80	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	26	UNSAT	13.7	10.2	-	-	-	-	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Lsnc Relu	27	UNSAT	12.8	9.44	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	28	UNSAT	14.9	10.7	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	29	UNSAT	13.0	9.52	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	30	UNSAT	15.3	11.2	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	31	UNSAT	14.4	10.5	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	32	UNSAT	14.4	10.5	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	33	UNSAT	13.0	9.65	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	34	UNSAT	13.0	9.53	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	35	UNSAT	13.6	9.88	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	36	UNSAT	13.8	10.1	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	37	UNSAT	13.5	9.93	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	38	UNSAT	12.9	9.49	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	39	UNSAT	13.0	9.58	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	40	UNSAT	13.1	9.61	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	41	UNSAT	13.0	9.60	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	42	UNSAT	13.1	9.64	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	43	UNSAT	16.0	11.4	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	44	SAT	0.30	1.52	0.94	-	6.70	-	-	-	-	-	-	-	✗
2026 Lsnc Relu	45	UNSAT	13.3	9.74	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	46	UNSAT	13.3	9.58	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	47	UNSAT	13.4	9.84	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	48	UNSAT	13.8	10.1	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	49	UNSAT	13.4	9.85	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	50	UNSAT	13.7	9.99	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	51	UNSAT	13.0	9.52	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	52	UNSAT	12.8	9.52	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	53	UNSAT	14.8	10.8	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	54	SAT	0.28	1.73	0.94	-	6.73	-	-	-	-	-	-	-	✗
2026 Lsnc Relu	55	UNSAT	12.9	9.62	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	56	SAT	0.30	1.54	0.96	-	6.74	-	-	-	-	-	-	-	✗
2026 Lsnc Relu	57	UNSAT	13.2	9.79	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	58	SAT	0.32	5.01	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	59	UNSAT	12.8	9.62	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	60	UNSAT	12.8	9.54	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	61	SAT	0.27	1.66	1.01	-	6.70	-	-	-	-	-	-	-	✗
2026 Lsnc Relu	62	UNSAT	14.1	10.5	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	63	UNSAT	12.8	9.51	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	64	UNSAT	12.9	9.56	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	65	UNSAT	13.9	10.3	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	66	UNSAT	13.9	10.2	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	67	UNSAT	13.1	9.69	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	68	UNSAT	12.9	9.46	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	69	UNSAT	13.0	9.60	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	70	UNSAT	12.8	9.48	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	71	UNSAT	12.9	9.46	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	72	UNSAT	13.0	9.62	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	73	SAT	0.29	1.65	0.98	-	6.62	-	-	-	-	-	-	-	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Lsnc Relu	74	SAT	0.34	5.05	-	-	9.45	-	-	-	-	-	-	-	-
2026 Lsnc Relu	75	UNSAT	13.5	9.94	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	76	UNSAT	12.9	9.48	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	77	UNSAT	14.5	10.5	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	78	UNSAT	13.1	9.61	-	-	-	-	-	-	-	-	-	-	-
2026 Lsnc Relu	79	UNSAT	15.1	11.2	-	-	-	-	-	-	-	-	-	-	-
2026 Malbeware	0	UNSAT	0.05	0.55	0.81	10.6	45.4	<0.01	2.00	16.4	18.9	0.37	4.88	-	-
2026 Malbeware	1	UNSAT	0.03	0.54	0.82	10.5	42.6	<0.01	1.93	16.4	18.9	0.37	4.89	-	-
2026 Malbeware	2	UNSAT	0.02	0.54	0.78	10.5	42.2	<0.01	1.91	16.5	18.7	0.40	4.92	-	-
2026 Malbeware	3	UNSAT	0.03	0.54	0.81	10.6	43.7	<0.01	1.90	16.5	18.7	0.37	6.85	-	-
2026 Malbeware	4	SAT	0.18	0.81	0.74	2.24	8.08	0.21	1.73	0.35	0.33	0.36	✗	-	✗
2026 Malbeware	5	SAT	0.15	0.80	0.75	1.49	5.37	0.21	1.73	0.32	0.33	0.39	9.20	-	✗
2026 Malbeware	6	SAT	0.19	-	0.77	2.29	-	0.21	1.74	-	0.49	0.37	11.3	-	-
2026 Malbeware	7	UNSAT	0.03	0.54	0.84	10.6	42.0	<0.01	1.92	16.6	19.1	0.36	8.28	-	-
2026 Malbeware	8	UNSAT	0.02	0.54	0.85	10.5	42.2	<0.01	1.92	16.5	18.8	0.36	11.2	-	-
2026 Malbeware	9	UNSAT	0.01	0.53	0.84	10.6	42.8	<0.01	1.93	16.4	18.8	0.38	8.32	-	-
2026 Malbeware	10	UNSAT	<0.01	0.54	0.83	10.5	42.3	<0.01	1.91	16.6	18.5	0.32	8.49	-	-
2026 Malbeware	11	UNSAT	0.01	0.54	0.81	10.5	43.1	<0.01	1.90	16.6	18.8	0.34	8.37	-	-
2026 Malbeware	12	UNSAT	<0.01	0.53	0.81	10.5	42.2	<0.01	1.90	16.3	18.6	0.34	8.39	-	-
2026 Malbeware	13	UNSAT	0.03	0.53	0.85	10.5	42.3	<0.01	1.91	16.5	18.6	0.38	11.2	-	-
2026 Malbeware	14	UNSAT	<0.01	0.53	0.82	10.6	42.6	<0.01	1.95	16.4	18.7	0.36	8.44	-	-
2026 Malbeware	15	SAT	0.13	0.79	0.79	1.49	8.56	0.21	1.73	0.36	0.32	0.38	10.4	-	✗
2026 Malbeware	16	SAT	0.13	0.80	0.72	1.49	5.37	0.21	1.74	0.48	0.37	0.43	9.05	-	✗
2026 Malbeware	17	UNSAT	0.01	0.55	0.83	10.6	42.8	<0.01	1.90	16.3	18.8	0.38	8.31	-	-
2026 Malbeware	18	UNSAT	<0.01	0.54	0.84	10.5	42.8	<0.01	1.93	16.2	19.0	0.40	9.18	-	-
2026 Malbeware	19	UNSAT	0.02	0.54	0.85	10.5	42.6	<0.01	1.94	16.3	18.9	0.36	8.39	-	-
2026 Malbeware	20	SAT	0.18	0.82	0.80	2.24	9.93	0.21	1.74	0.37	0.39	0.37	10.4	-	-
2026 Malbeware	21	UNSAT	0.03	0.55	0.78	10.5	42.3	<0.01	1.94	16.4	18.8	0.36	8.64	-	-
2026 Malbeware	22	UNSAT	0.03	0.54	0.84	10.5	42.4	<0.01	1.97	16.4	18.7	0.37	9.60	-	-
2026 Malbeware	23	UNSAT	0.01	0.54	0.87	10.5	42.5	<0.01	1.92	16.3	18.9	0.39	8.79	-	-
2026 Malbeware	24	UNSAT	<0.01	0.56	0.83	10.5	42.4	<0.01	1.90	16.5	19.0	0.39	9.59	-	-
2026 Malbeware	25	UNSAT	<0.01	0.56	0.88	10.6	42.1	<0.01	1.91	16.3	18.5	0.36	8.53	-	-
2026 Malbeware	26	UNSAT	0.02	0.55	0.83	10.5	42.6	<0.01	1.91	16.5	18.9	0.42	9.42	-	-
2026 Malbeware	27	UNSAT	0.05	0.55	0.81	10.5	43.0	<0.01	1.93	16.4	19.0	0.33	9.52	-	-
2026 Malbeware	28	UNSAT	<0.01	0.55	0.82	10.5	41.9	<0.01	1.92	16.4	18.8	0.38	9.00	-	-
2026 Malbeware	29	UNSAT	0.02	0.55	0.85	10.5	42.3	<0.01	1.91	16.5	18.7	0.35	8.50	-	-
2026 Malbeware	30	UNSAT	0.02	0.55	0.82	10.6	42.1	<0.01	1.95	16.5	19.2	0.39	9.73	-	-
2026 Malbeware	31	UNSAT	0.02	0.54	0.83	10.5	42.3	<0.01	1.91	16.6	18.9	0.41	8.54	-	-
2026 Malbeware	32	UNSAT	0.02	0.56	0.80	10.5	42.4	<0.01	1.91	16.5	18.8	0.39	9.05	-	-
2026 Malbeware	33	UNSAT	0.01	0.54	0.81	10.5	42.8	<0.01	1.92	16.5	18.8	0.39	8.47	-	-
2026 Malbeware	34	UNSAT	0.02	0.54	0.85	10.5	42.9	<0.01	1.93	16.7	18.7	0.36	8.34	-	-
2026 Malbeware	35	UNSAT	0.03	0.54	0.83	10.5	43.8	<0.01	1.91	16.5	19.6	0.38	8.69	-	-
2026 Malbeware	36	SAT	0.18	0.79	0.78	2.22	7.06	0.21	1.73	0.37	1.08	0.39	10.00	-	-
2026 Malbeware	37	UNSAT	0.01	0.55	0.83	10.5	42.6	<0.01	1.93	16.5	20.3	0.36	9.16	-	-
2026 Malbeware	38	UNSAT	0.02	0.54	0.83	10.5	42.8	<0.01	1.91	16.1	19.2	0.40	8.67	-	-
2026 Malbeware	39	UNSAT	0.03	0.53	0.86	10.6	42.3	<0.01	1.92	16.5	18.7	0.36	8.60	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Malbeware	40	UNSAT	0.03	0.54	0.88	10.5	42.9	<0.01	1.90	16.2	18.8	0.35	8.40	-	-
2026 Malbeware	41	UNSAT	0.04	0.54	0.83	10.5	42.6	<0.01	1.92	16.4	19.0	0.36	9.31	-	-
2026 Malbeware	42	UNSAT	0.03	0.54	0.81	10.5	42.9	<0.01	1.91	16.5	18.7	0.37	8.34	-	-
2026 Malbeware	43	UNSAT	0.01	0.55	0.83	10.5	42.6	<0.01	1.93	16.5	18.7	0.34	8.32	-	-
2026 Malbeware	44	SAT	0.19	0.82	0.76	2.22	6.16	0.21	1.74	0.35	0.34	0.38	✗	-	-
2026 Malbeware	45	UNSAT	0.01	0.54	0.86	10.5	42.4	<0.01	1.94	16.5	18.7	0.40	8.65	-	-
2026 Malbeware	46	UNSAT	0.02	0.54	0.81	10.5	42.6	<0.01	1.93	16.1	18.7	0.42	9.61	-	-
2026 Malbeware	47	SAT	0.21	-	0.79	2.23	-	0.21	1.76	-	0.47	0.37	12.9	-	-
2026 Malbeware	48	UNSAT	0.03	0.55	0.82	10.5	43.5	<0.01	1.92	16.4	18.7	0.38	8.40	-	-
2026 Malbeware	49	SAT	0.19	0.82	0.73	2.24	8.18	0.21	1.74	0.51	0.35	0.36	9.36	-	✗
2026 Malbeware	50	UNSAT	0.32	3.25	1.13	11.1	57.6	0.21	5.13	-	20.9	0.61	18.7	-	-
2026 Malbeware	51	UNSAT	0.35	3.26	1.36	11.1	55.3	0.21	5.15	-	20.8	0.61	18.5	-	-
2026 Malbeware	52	UNSAT	0.32	3.23	1.12	11.1	55.1	0.21	5.17	-	20.7	0.59	17.1	-	-
2026 Malbeware	53	UNSAT	0.32	3.25	1.35	11.1	56.0	0.21	5.13	-	20.9	0.61	19.8	-	-
2026 Malbeware	54	SAT	1.12	1.10	0.93	2.61	-	-	4.66	-	0.46	0.64	-	-	-
2026 Malbeware	55	SAT	1.21	1.10	0.92	2.45	10.9	-	4.70	0.42	0.42	0.64	-	-	-
2026 Malbeware	56	SAT	1.04	1.09	0.94	2.45	-	-	4.66	-	0.48	0.67	-	-	-
2026 Malbeware	57	UNSAT	0.35	3.22	1.09	11.1	54.6	0.21	5.17	-	20.7	0.60	15.7	-	-
2026 Malbeware	58	UNSAT	0.32	3.24	1.13	11.1	56.2	0.21	5.14	-	20.6	0.63	18.8	-	-
2026 Malbeware	59	UNSAT	0.33	3.25	1.11	11.1	54.5	0.21	5.14	-	20.7	0.57	15.9	-	-
2026 Malbeware	60	UNSAT	0.33	3.22	1.12	11.1	54.6	0.21	5.22	-	20.9	0.58	15.9	-	-
2026 Malbeware	61	UNSAT	0.33	3.24	1.12	11.1	55.3	0.21	5.13	-	20.7	0.62	18.8	-	-
2026 Malbeware	62	UNSAT	0.33	3.24	1.21	11.1	54.8	0.21	5.16	-	20.8	0.67	17.8	-	-
2026 Malbeware	63	UNSAT	0.34	3.22	1.14	11.1	55.5	0.21	5.17	-	20.8	0.63	17.6	-	-
2026 Malbeware	64	UNSAT	0.36	3.23	1.27	11.1	54.9	0.21	5.19	-	20.7	0.63	19.0	-	-
2026 Malbeware	65	SAT	1.05	1.10	0.91	2.41	14.1	-	4.69	0.58	0.39	0.61	-	-	-
2026 Malbeware	66	UNSAT	0.34	3.22	1.10	11.1	54.9	0.21	5.13	-	20.9	0.65	18.0	-	-
2026 Malbeware	67	UNSAT	0.35	3.21	1.11	11.1	55.6	0.21	5.12	-	21.4	0.64	16.2	-	-
2026 Malbeware	68	UNSAT	0.32	3.19	1.12	11.2	55.6	0.21	5.15	-	21.1	0.61	17.0	-	-
2026 Malbeware	69	UNSAT	0.33	3.23	1.13	11.1	54.8	0.21	5.14	-	20.9	0.62	19.1	-	-
2026 Malbeware	70	UNSAT	0.31	3.24	1.19	11.1	55.0	0.21	5.15	-	20.7	0.63	18.7	-	-
2026 Malbeware	71	SAT	1.08	1.10	0.91	2.37	-	-	4.66	0.68	0.44	0.63	-	-	-
2026 Malbeware	72	UNSAT	0.31	3.23	1.28	11.1	55.4	0.21	5.13	-	20.8	0.65	17.6	-	-
2026 Malbeware	73	UNSAT	0.32	3.25	1.12	11.1	56.1	0.21	5.15	-	21.1	0.60	18.8	-	-
2026 Malbeware	74	UNSAT	0.32	3.22	1.14	11.1	54.5	0.21	5.14	-	20.5	0.62	17.5	-	-
2026 Malbeware	75	UNSAT	0.32	3.25	1.13	11.1	56.1	0.21	5.12	-	20.7	0.56	16.4	-	-
2026 Malbeware	76	UNSAT	0.33	3.27	1.31	11.1	55.5	0.21	5.13	-	20.9	0.68	19.8	-	-
2026 Malbeware	77	UNSAT	0.34	3.13	1.19	11.1	56.6	0.21	5.13	-	20.8	0.65	18.2	-	-
2026 Malbeware	78	UNSAT	0.33	3.29	1.14	11.1	54.9	0.21	5.14	-	21.0	0.64	17.7	-	-
2026 Malbeware	79	UNSAT	0.31	3.21	1.13	11.1	56.3	0.21	5.18	-	20.8	0.61	18.7	-	-
2026 Malbeware	80	UNSAT	0.34	3.23	1.13	11.1	54.9	0.21	5.12	-	20.6	0.65	17.4	-	-
2026 Malbeware	81	UNSAT	0.34	3.21	1.12	11.1	54.9	0.21	5.14	-	20.8	0.57	18.3	-	-
2026 Malbeware	82	UNSAT	0.33	3.22	1.14	11.1	55.1	0.21	5.13	-	20.8	0.58	17.0	-	-
2026 Malbeware	83	SAT	1.04	1.09	0.95	2.35	-	-	4.68	-	0.52	0.59	-	-	-
2026 Malbeware	84	UNSAT	0.33	3.24	1.11	11.1	56.0	0.21	5.14	-	20.8	0.60	17.3	-	-
2026 Malbeware	85	UNSAT	0.32	3.23	1.13	11.1	55.4	0.21	5.15	-	21.1	0.56	18.0	-	-
2026 Malbeware	86	SAT	0.98	1.09	0.90	2.44	14.1	-	4.69	0.56	0.38	0.64	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Malbeware	87	UNSAT	0.32	3.24	1.10	11.1	55.5	0.21	5.15	-	20.7	0.59	16.9	-	-
2026 Malbeware	88	UNSAT	0.33	3.21	1.09	11.1	55.5	0.21	5.16	-	20.7	0.59	18.8	-	-
2026 Malbeware	89	UNSAT	0.33	3.28	1.09	11.1	54.4	0.21	5.14	-	20.8	0.67	15.9	-	-
2026 Malbeware	90	UNSAT	0.32	3.21	1.11	11.1	55.5	0.21	5.16	-	20.8	0.61	18.1	-	-
2026 Malbeware	91	SAT	1.07	1.03	0.90	2.47	13.7	-	4.67	0.39	0.41	0.62	-	-	-
2026 Malbeware	92	UNSAT	0.32	3.23	1.29	11.1	55.4	0.21	5.13	-	20.8	0.62	18.6	-	-
2026 Malbeware	93	SAT	1.05	1.10	0.92	2.37	-	-	4.67	-	0.51	0.69	-	-	-
2026 Malbeware	94	SAT	1.04	1.02	0.91	2.44	11.0	-	4.67	0.39	0.36	0.63	-	-	-
2026 Malbeware	95	UNSAT	0.32	3.23	1.12	11.1	55.0	0.21	5.13	-	21.2	0.59	16.1	-	-
2026 Malbeware	96	SAT	1.02	1.12	0.95	2.37	-	-	4.68	-	0.48	0.62	-	-	-
2026 Malbeware	97	UNSAT	0.33	3.22	1.10	11.1	55.0	0.21	5.15	-	21.4	0.63	18.1	-	-
2026 Malbeware	98	UNSAT	0.31	3.21	1.07	11.1	54.6	0.21	5.14	-	20.8	0.62	15.8	-	-
2026 Malbeware	99	UNSAT	0.32	3.21	1.09	11.1	54.9	0.21	5.15	-	20.8	0.64	17.5	-	-
2026 Malbeware	100	UNSAT	0.35	3.38	-	11.2	67.7	0.62	10.8	-	21.4	0.98	-	-	-
2026 Malbeware	101	UNSAT	0.36	3.34	2.14	11.1	65.6	0.62	10.8	-	21.6	0.88	-	-	-
2026 Malbeware	102	UNSAT	0.35	3.33	1.63	11.2	64.1	0.62	10.8	-	22.1	0.80	-	-	-
2026 Malbeware	103	UNSAT	0.37	3.35	2.20	11.2	64.7	0.62	10.8	-	21.5	0.86	-	-	-
2026 Malbeware	104	UNSAT	0.36	3.32	1.89	11.2	64.6	0.62	10.8	-	21.4	0.84	-	-	-
2026 Malbeware	105	SAT	1.14	1.08	1.08	2.50	10.7	-	9.68	0.50	0.41	0.87	-	-	-
2026 Malbeware	106	SAT	1.11	1.58	-	2.75	-	-	9.67	-	0.71	-	-	-	-
2026 Malbeware	107	UNSAT	0.37	3.23	1.41	11.1	66.0	0.62	10.8	-	21.5	0.76	-	-	-
2026 Malbeware	108	UNSAT	0.36	3.32	1.60	11.1	66.1	0.62	10.8	-	21.9	0.81	-	-	-
2026 Malbeware	109	UNSAT	0.36	3.30	1.57	11.1	68.7	0.62	10.8	-	21.5	0.82	-	-	-
2026 Malbeware	110	UNSAT	0.35	3.29	1.59	11.1	66.6	0.62	10.8	-	21.3	0.83	-	-	-
2026 Malbeware	111	UNSAT	0.34	3.27	1.41	11.1	65.4	0.62	10.8	-	22.0	0.75	-	-	-
2026 Malbeware	112	UNSAT	0.36	3.31	1.84	11.2	65.3	0.62	10.8	-	21.4	0.83	-	-	-
2026 Malbeware	113	UNSAT	0.36	3.31	1.62	11.1	64.3	0.62	10.8	-	21.6	0.84	-	-	-
2026 Malbeware	114	UNSAT	0.36	3.32	1.81	11.2	64.4	0.62	10.8	-	21.8	0.81	-	-	-
2026 Malbeware	115	SAT	1.07	1.06	1.06	2.50	15.1	-	9.65	0.51	0.42	0.91	-	-	-
2026 Malbeware	116	SAT	0.99	1.04	1.10	1.73	10.8	-	9.67	0.40	0.38	0.81	-	-	✗
2026 Malbeware	117	UNSAT	0.36	3.35	2.05	11.2	66.9	-	10.8	-	21.8	0.83	-	-	-
2026 Malbeware	118	UNSAT	0.36	3.28	1.50	11.1	64.0	0.62	10.8	-	21.6	0.81	-	-	-
2026 Malbeware	119	UNSAT	0.36	3.34	1.77	11.2	64.6	0.62	10.8	-	21.5	0.80	-	-	-
2026 Malbeware	120	UNSAT	0.35	3.27	1.52	11.2	64.7	0.62	10.8	-	21.4	0.80	-	-	-
2026 Malbeware	121	UNSAT	0.51	3.85	2.49	12.2	65.6	-	11.1	-	37.0	16.6	-	-	-
2026 Malbeware	122	UNSAT	0.36	3.26	1.88	11.2	64.9	0.62	10.8	-	21.3	0.83	-	-	-
2026 Malbeware	123	UNSAT	0.38	3.33	2.13	11.1	65.0	0.62	10.8	-	21.7	0.85	-	-	-
2026 Malbeware	124	UNSAT	0.35	3.30	1.61	11.1	64.8	0.62	10.8	-	21.7	0.79	-	-	-
2026 Malbeware	125	UNSAT	0.37	3.29	1.50	11.1	64.8	0.62	10.8	-	21.4	0.79	-	-	-
2026 Malbeware	126	UNSAT	0.37	3.32	1.98	11.1	64.9	0.62	10.8	-	21.5	0.84	-	-	-
2026 Malbeware	127	UNSAT	0.37	3.29	1.83	11.1	65.2	0.62	10.8	-	21.6	0.84	-	-	-
2026 Malbeware	128	SAT	1.04	1.12	1.13	2.50	-	-	9.65	-	0.52	0.92	-	-	-
2026 Malbeware	129	UNSAT	0.36	3.33	2.00	11.2	64.3	-	10.8	-	21.5	0.85	-	-	-
2026 Malbeware	130	UNSAT	0.37	3.30	1.49	11.1	64.5	0.62	10.8	-	21.3	0.80	-	-	-
2026 Malbeware	131	UNSAT	0.35	3.31	1.71	11.1	64.5	0.62	10.8	-	21.7	0.83	-	-	-
2026 Malbeware	132	UNSAT	0.39	3.27	1.47	11.1	64.1	0.62	10.8	-	22.1	0.77	-	-	-
2026 Malbeware	133	SAT	1.07	1.12	1.13	2.45	-	-	9.66	1.82	0.50	0.87	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Malbeware	134	UNSAT	0.35	3.31	1.73	11.2	64.5	0.62	10.8	-	21.5	0.82	-	-	-
2026 Malbeware	135	UNSAT	0.37	3.38	-	11.2	64.8	0.62	10.8	-	21.3	0.88	-	-	-
2026 Malbeware	136	UNSAT	0.36	3.29	1.55	11.2	64.5	0.62	10.8	-	21.6	0.79	-	-	-
2026 Malbeware	137	UNSAT	0.35	3.31	1.49	11.1	65.8	0.62	10.8	-	21.6	0.81	-	-	-
2026 Malbeware	138	UNSAT	0.35	3.29	1.57	11.2	65.0	0.62	10.8	-	21.5	0.83	-	-	-
2026 Malbeware	139	UNSAT	0.36	3.30	1.47	11.1	64.6	0.62	10.8	-	21.7	0.76	-	-	-
2026 Malbeware	140	UNSAT	0.36	3.30	1.57	11.2	65.4	0.62	10.8	-	21.5	0.79	-	-	-
2026 Malbeware	141	SAT	1.13	1.09	1.11	2.51	10.7	-	9.66	0.47	0.41	0.88	-	-	-
2026 Malbeware	142	UNSAT	0.36	3.36	2.10	11.2	65.2	0.62	10.8	-	21.4	0.88	-	-	-
2026 Malbeware	143	UNSAT	0.53	3.86	8.69	12.1	-	-	11.1	-	36.8	16.7	-	-	-
2026 Malbeware	144	SAT	1.11	1.06	1.13	2.47	-	-	9.67	0.55	0.46	0.86	-	-	-
2026 Malbeware	145	UNSAT	0.38	3.29	1.49	11.2	66.6	0.62	10.8	-	21.6	0.83	-	-	-
2026 Malbeware	146	UNSAT	35.1	42.7	-	-	-	-	-	-	-	-	-	-	-
2026 Malbeware	147	UNSAT	0.36	3.33	1.72	11.2	65.1	0.62	10.8	-	21.6	0.78	-	-	-
2026 Malbeware	148	UNSAT	0.36	3.27	1.57	11.1	64.2	0.62	10.8	-	21.4	0.78	-	-	-
2026 Malbeware	149	UNSAT	0.35	3.29	1.49	11.1	64.6	0.62	10.8	-	21.6	0.76	-	-	-
2026 Metaroom 2023	0	UNSAT	3.20	5.66	2.87	-	-	-	11.0	-	-	-	-	-	-
2026 Metaroom 2023	1	UNSAT	0.67	0.93	2.48	12.1	16.6	9.37	31.0	9.08	-	-	-	-	-
2026 Metaroom 2023	2	UNSAT	0.40	0.83	0.93	11.7	10.9	8.52	4.27	3.68	-	-	-	-	-
2026 Metaroom 2023	3	UNSAT	0.69	0.94	2.44	12.0	16.6	9.27	31.0	9.19	-	-	-	-	-
2026 Metaroom 2023	4	UNSAT	0.79	1.01	2.87	12.3	19.3	9.22	31.0	9.67	-	-	2.38	-	-
2026 Metaroom 2023	5	UNSAT	0.41	0.82	0.91	11.7	10.9	8.48	4.27	3.77	-	-	-	-	-
2026 Metaroom 2023	6	UNSAT	0.45	0.86	0.93	11.9	12.6	8.74	4.27	3.70	-	-	1.94	-	-
2026 Metaroom 2023	7	UNSAT	0.67	0.93	2.48	12.1	17.0	9.23	31.0	9.27	-	-	-	-	-
2026 Metaroom 2023	8	UNSAT	0.82	1.00	2.98	12.4	19.4	9.24	31.0	10.1	-	-	2.50	-	-
2026 Metaroom 2023	9	UNSAT	0.80	1.04	3.23	12.3	20.4	9.18	31.0	9.99	-	-	3.27	-	-
2026 Metaroom 2023	10	UNSAT	0.42	0.88	1.06	11.6	12.6	8.48	4.28	3.69	-	-	1.11	-	-
2026 Metaroom 2023	11	UNSAT	0.41	0.83	0.90	11.7	10.9	8.41	4.28	3.76	-	-	-	-	-
2026 Metaroom 2023	12	UNSAT	0.42	0.90	1.05	11.9	12.6	8.53	4.26	3.94	-	-	1.61	-	-
2026 Metaroom 2023	13	UNSAT	0.80	1.01	2.73	12.4	18.3	9.20	31.0	9.59	-	-	2.23	-	-
2026 Metaroom 2023	14	UNSAT	0.74	0.98	2.48	12.4	18.5	9.20	31.0	9.25	-	-	2.13	-	-
2026 Metaroom 2023	15	UNSAT	0.41	0.88	0.95	11.8	12.5	8.45	4.28	3.67	-	-	1.11	-	-
2026 Metaroom 2023	16	UNSAT	0.69	0.93	2.47	12.3	16.9	9.17	31.0	9.21	-	-	-	-	-
2026 Metaroom 2023	17	UNSAT	0.68	0.93	2.44	12.2	16.8	9.28	31.0	9.26	-	-	-	-	-
2026 Metaroom 2023	18	UNSAT	0.81	1.02	3.00	12.6	20.4	9.23	31.0	9.69	-	-	3.34	-	-
2026 Metaroom 2023	19	UNSAT	0.69	0.93	2.44	12.3	16.6	9.29	31.0	9.11	-	-	-	-	-
2026 Metaroom 2023	20	UNSAT	0.67	0.94	2.43	12.3	16.5	9.13	31.0	9.53	-	-	-	-	-
2026 Metaroom 2023	21	UNSAT	0.70	0.95	2.50	12.5	18.2	9.30	31.0	9.37	-	-	1.99	-	-
2026 Metaroom 2023	22	UNSAT	0.41	0.83	0.92	11.7	11.0	8.51	4.26	3.56	-	-	-	-	-
2026 Metaroom 2023	23	UNSAT	0.82	1.03	3.14	12.5	20.7	9.17	31.0	9.79	-	-	3.46	-	-
2026 Metaroom 2023	24	UNSAT	0.68	0.93	2.32	12.1	16.6	9.24	31.0	9.18	-	-	-	-	-
2026 Metaroom 2023	25	UNSAT	0.80	1.03	3.08	12.5	23.1	9.31	31.0	10.2	-	-	6.23	-	-
2026 Metaroom 2023	26	UNSAT	0.40	0.82	0.91	11.7	10.9	8.46	4.27	3.62	-	-	-	-	-
2026 Metaroom 2023	27	UNSAT	0.41	0.83	0.92	11.6	10.9	8.49	4.30	3.63	-	-	-	-	-
2026 Metaroom 2023	28	UNSAT	0.40	0.84	0.91	11.7	10.9	8.47	4.26	3.67	-	-	-	-	-
2026 Metaroom 2023	29	UNSAT	0.80	1.01	2.85	12.3	19.5	9.26	31.0	9.54	-	-	2.47	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Metaroom 2023	30	UNSAT	0.38	0.89	1.07	11.6	12.5	8.51	4.29	3.84	-	-	1.09	-	-
2026 Metaroom 2023	31	SAT	0.94	1.64	2.18	2.91	21.8	-	23.9	2.56	-	-	-	47.4	✗
2026 Metaroom 2023	32	UNSAT	0.68	0.86	2.34	12.1	16.4	9.17	31.0	9.06	-	-	-	-	-
2026 Metaroom 2023	33	UNSAT	0.67	0.93	2.44	12.1	16.4	9.26	31.0	9.06	-	-	-	-	-
2026 Metaroom 2023	34	UNSAT	0.78	1.03	3.02	12.3	20.3	9.26	31.0	9.97	-	-	3.31	-	-
2026 Metaroom 2023	35	UNSAT	0.40	0.82	0.90	11.6	10.9	8.44	4.26	3.61	-	-	-	-	-
2026 Metaroom 2023	36	UNSAT	0.42	0.91	1.09	11.9	12.6	8.53	4.27	3.84	-	-	1.05	-	-
2026 Metaroom 2023	37	UNSAT	0.68	0.94	2.34	12.1	16.9	9.23	31.0	9.49	-	-	-	-	-
2026 Metaroom 2023	38	UNSAT	0.67	0.92	2.44	12.1	16.9	9.29	31.0	9.21	-	-	-	-	-
2026 Metaroom 2023	39	UNSAT	0.39	0.83	0.91	11.6	11.0	8.45	4.28	3.81	-	-	-	-	-
2026 Metaroom 2023	40	UNSAT	0.78	1.04	3.21	12.4	22.3	9.23	31.0	10.1	-	-	6.18	-	-
2026 Metaroom 2023	41	SAT	0.61	1.14	0.74	2.39	-	-	3.17	0.78	-	-	3.02	-	-
2026 Metaroom 2023	42	UNSAT	0.51	0.93	1.31	11.9	13.6	8.51	4.27	3.98	-	-	2.18	-	-
2026 Metaroom 2023	43	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Metaroom 2023	44	UNSAT	0.80	1.05	3.09	12.3	20.3	9.18	31.0	9.47	-	-	3.61	-	-
2026 Metaroom 2023	45	UNSAT	0.69	0.93	2.47	12.2	16.5	9.21	31.0	9.54	-	-	-	-	-
2026 Metaroom 2023	46	UNSAT	0.42	0.84	0.91	11.7	10.9	8.53	4.27	3.65	-	-	-	-	-
2026 Metaroom 2023	47	UNSAT	0.71	1.01	2.74	12.3	18.3	9.24	31.0	9.25	-	-	2.26	-	-
2026 Metaroom 2023	48	UNSAT	0.69	0.94	2.43	12.1	16.5	9.29	31.0	9.16	-	-	-	-	-
2026 Metaroom 2023	49	UNSAT	0.68	0.94	2.46	12.1	16.4	9.19	31.0	9.45	-	-	-	-	-
2026 Metaroom 2023	50	UNSAT	0.40	0.83	0.92	11.7	11.0	8.47	4.28	3.67	-	-	-	-	-
2026 Metaroom 2023	51	UNSAT	0.40	0.87	0.91	11.7	12.5	8.51	4.27	3.72	-	-	1.09	-	-
2026 Metaroom 2023	52	UNSAT	0.50	0.88	1.13	11.9	12.6	8.47	4.27	3.82	-	-	1.00	-	-
2026 Metaroom 2023	53	SAT	0.91	1.60	2.08	2.90	20.4	-	23.8	1.54	-	-	-	33.5	✗
2026 Metaroom 2023	54	UNSAT	0.39	0.77	0.87	11.7	10.9	8.47	4.28	3.64	-	-	-	-	-
2026 Metaroom 2023	55	UNSAT	0.52	0.91	1.17	12.0	12.7	8.44	4.29	3.64	-	-	1.34	-	-
2026 Metaroom 2023	56	UNSAT	0.70	0.96	2.32	12.3	18.2	9.19	31.0	9.21	-	-	1.99	-	-
2026 Metaroom 2023	57	SAT	0.95	1.61	2.09	2.46	19.7	-	23.8	1.53	-	-	-	32.3	✗
2026 Metaroom 2023	58	UNSAT	0.40	0.76	0.93	11.8	10.9	8.41	4.29	3.66	-	-	-	-	-
2026 Metaroom 2023	59	UNSAT	0.67	0.93	2.48	12.1	16.5	9.23	31.0	9.19	-	-	-	-	-
2026 Metaroom 2023	60	UNSAT	0.53	0.91	1.05	12.0	12.6	8.50	4.28	3.65	-	-	1.07	-	-
2026 Metaroom 2023	61	UNSAT	0.40	0.87	0.92	11.7	12.6	8.52	4.25	3.81	-	-	1.04	-	-
2026 Metaroom 2023	62	UNSAT	0.41	0.84	0.92	11.7	10.9	8.72	4.27	3.59	-	-	-	-	-
2026 Metaroom 2023	63	UNSAT	0.69	0.93	2.31	12.1	16.6	9.18	31.0	9.47	-	-	-	-	-
2026 Metaroom 2023	64	UNSAT	0.79	1.03	3.00	12.4	20.7	9.20	31.0	9.91	-	-	3.25	-	-
2026 Metaroom 2023	65	UNSAT	0.73	1.02	2.88	12.4	18.4	9.33	31.0	9.28	-	-	2.31	-	-
2026 Metaroom 2023	66	UNSAT	0.80	1.00	2.87	12.4	19.4	9.19	31.0	10.1	-	-	2.70	-	-
2026 Metaroom 2023	67	UNSAT	0.79	1.02	2.89	12.4	19.9	9.18	31.0	9.73	-	-	2.48	-	-
2026 Metaroom 2023	68	UNSAT	0.80	1.03	3.01	12.4	20.9	9.26	31.0	9.77	-	-	3.49	-	-
2026 Metaroom 2023	69	UNSAT	0.41	0.84	0.93	11.7	10.9	8.50	4.28	3.67	-	-	-	-	-
2026 Metaroom 2023	70	UNSAT	0.41	0.83	0.94	11.7	10.9	8.41	4.27	3.56	-	-	-	-	-
2026 Metaroom 2023	71	UNSAT	0.79	1.01	2.62	12.3	18.3	9.29	31.0	9.20	-	-	2.23	-	-
2026 Metaroom 2023	72	UNSAT	1.49	5.59	1.28	12.7	13.8	-	6.76	-	-	-	2.86	-	-
2026 Metaroom 2023	73	SAT	0.63	1.17	0.81	1.78	15.3	-	3.16	0.67	-	-	2.86	12.7	✗
2026 Metaroom 2023	74	SAT	0.96	1.64	-	3.48	-	-	23.8	-	-	-	-	-	-
2026 Metaroom 2023	75	UNSAT	0.40	0.77	0.92	11.7	10.9	8.43	4.30	3.61	-	-	-	-	-
2026 Metaroom 2023	76	UNSAT	0.69	0.95	2.42	12.1	16.5	9.22	31.0	9.23	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Metaroom 2023	77	UNSAT	0.40	0.87	0.95	11.7	12.5	8.57	4.28	3.65	-	-	1.08	-	-
2026 Metaroom 2023	78	UNSAT	0.79	1.03	2.94	12.3	19.4	9.25	31.0	9.66	-	-	2.47	-	-
2026 Metaroom 2023	79	UNSAT	0.41	0.83	0.92	11.7	10.8	8.44	4.32	3.64	-	-	-	-	-
2026 Metaroom 2023	80	UNSAT	0.79	1.03	3.07	12.4	22.6	9.19	31.0	10.3	-	-	6.21	-	-
2026 Metaroom 2023	81	UNSAT	0.74	1.02	2.62	12.4	18.7	9.24	30.9	9.17	-	-	2.31	-	-
2026 Metaroom 2023	82	UNSAT	0.43	0.84	0.89	11.7	10.9	8.48	4.29	3.64	-	-	-	-	-
2026 Metaroom 2023	83	UNSAT	0.52	0.93	1.30	11.8	13.7	-	4.27	4.06	-	-	1.49	-	-
2026 Metaroom 2023	84	UNSAT	0.80	1.04	3.11	12.4	23.9	9.25	31.0	10.3	-	-	7.59	-	-
2026 Metaroom 2023	85	UNSAT	0.50	0.87	0.91	12.1	12.7	8.67	4.26	3.70	-	-	1.52	-	-
2026 Metaroom 2023	86	UNSAT	0.74	1.00	2.84	12.3	19.3	9.13	31.0	9.38	-	-	2.49	-	-
2026 Metaroom 2023	87	UNSAT	0.39	0.83	0.91	11.7	10.9	8.43	4.25	3.64	-	-	-	-	-
2026 Metaroom 2023	88	UNSAT	0.71	0.95	2.51	12.3	18.2	9.29	31.0	9.17	-	-	1.98	-	-
2026 Metaroom 2023	89	UNSAT	0.79	1.03	3.06	12.4	22.6	9.18	31.0	10.3	-	-	5.98	-	-
2026 Metaroom 2023	90	UNSAT	0.69	0.93	2.48	12.1	16.5	9.27	31.0	9.25	-	-	-	-	-
2026 Metaroom 2023	91	UNSAT	0.70	0.96	2.54	12.3	18.2	9.28	31.0	9.25	-	-	2.01	-	-
2026 Metaroom 2023	92	UNSAT	0.40	0.85	0.94	11.8	12.5	8.44	4.27	3.81	-	-	1.04	-	-
2026 Metaroom 2023	93	UNSAT	0.67	0.95	2.29	12.1	16.5	9.26	31.0	9.20	-	-	-	-	-
2026 Metaroom 2023	94	UNSAT	0.81	1.05	3.15	12.3	20.7	9.27	31.0	9.83	-	-	3.41	-	-
2026 Metaroom 2023	95	UNSAT	0.39	0.83	0.93	11.7	10.9	8.51	4.29	3.63	-	-	-	-	-
2026 Metaroom 2023	96	UNSAT	0.68	0.93	2.32	12.1	16.9	9.21	31.0	8.98	-	-	-	-	-
2026 Metaroom 2023	97	UNSAT	0.69	0.97	2.48	12.4	18.5	9.22	31.0	9.45	-	-	2.16	-	-
2026 Metaroom 2023	98	UNSAT	0.43	0.88	1.07	11.9	12.6	8.47	4.33	3.70	-	-	1.05	-	-
2026 Metaroom 2023	99	UNSAT	0.43	0.90	1.07	11.9	12.6	8.51	4.27	3.74	-	-	1.07	-	-
2026 Ml4acopf 2024	0	UNSAT	2.48	0.22	-	12.2	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	1	UNSAT	2.34	0.23	-	12.0	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	2	UNSAT	2.42	5.75	2.00	13.1	150	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	3	UNSAT	2.35	0.21	4.03	12.0	25.6	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	4	UNSAT	2.16	0.22	1.46	12.0	35.6	-	-	-	-	-	-	-	✗
2026 Ml4acopf 2024	5	UNSAT	2.35	0.20	1.88	12.0	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	6	UNSAT	2.37	0.21	1.32	12.1	25.7	-	-	10.1	-	-	-	-	-
2026 Ml4acopf 2024	7	UNSAT	2.35	0.22	1.49	12.0	25.8	-	-	10.1	-	-	-	-	-
2026 Ml4acopf 2024	8	UNSAT	2.39	0.23	1.35	12.1	25.4	-	-	9.77	-	-	-	-	-
2026 Ml4acopf 2024	9	SAT	0.36	0.20	1.07	0.86	3.14	-	-	0.12	-	-	-	0.93	✗
2026 Ml4acopf 2024	10	UNSAT	2.33	9.12	-	31.6	-	-	-	-	-	-	-	-	✗
2026 Ml4acopf 2024	11	UNSAT	2.37	0.22	-	12.0	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	12	UNSAT	2.35	0.22	1.32	12.0	25.5	-	-	10.0	-	-	-	-	-
2026 Ml4acopf 2024	13	UNSAT	2.38	0.22	-	12.0	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	14	UNSAT	99.9	-	-	-	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	15	UNSAT	3.97	4.40	2.08	-	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	16	UNSAT	17.8	138	2.03	-	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	17	UNSAT	2.28	0.87	1.42	12.0	-	-	-	-	52.2	-	-	-	-
2026 Ml4acopf 2024	18	UNSAT	2.30	0.83	1.44	12.1	-	-	-	-	52.0	-	-	-	-
2026 Ml4acopf 2024	19	UNSAT	69.6	7.71	-	-	-	-	-	-	-	-	-	-	✗
2026 Ml4acopf 2024	20	UNSAT	2.12	3.65	1.31	-	227	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	21	SAT	0.49	6.47	1.09	-	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	22	UNSAT	271	11.9	-	-	-	-	-	-	-	-	-	-	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Ml4acopf 2024	23	UNSAT	1.94	0.20	-	11.6	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	24	UNSAT	1.91	0.22	-	11.6	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	25	UNSAT	1.95	0.24	1.21	12.5	38.2	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	26	UNSAT	1.90	0.20	16.7	11.6	19.7	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	27	UNSAT	1.86	0.24	1.30	11.6	23.6	-	-	534	-	-	-	-	✗
2026 Ml4acopf 2024	28	UNSAT	1.92	0.19	1.70	11.6	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	29	UNSAT	1.89	0.23	1.10	11.5	19.4	-	-	8.35	-	-	-	-	-
2026 Ml4acopf 2024	30	UNSAT	1.89	0.18	1.83	11.6	19.8	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	31	UNSAT	1.91	0.20	1.22	11.6	19.4	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	32	SAT	0.41	0.20	1.01	0.89	1.27	-	-	0.26	-	-	-	0.90	✗
2026 Ml4acopf 2024	33	UNSAT	1.99	4.22	-	28.0	-	-	-	-	-	-	-	-	✗
2026 Ml4acopf 2024	34	UNSAT	1.90	0.22	-	11.5	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	35	UNSAT	1.89	0.22	1.14	11.6	19.6	-	-	8.37	-	-	-	-	-
2026 Ml4acopf 2024	36	UNSAT	1.91	0.23	-	11.5	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	37	UNSAT	72.0	-	-	-	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	38	UNSAT	18.7	4.61	-	-	-	-	-	-	-	-	-	-	✗
2026 Ml4acopf 2024	39	UNSAT	20.6	4.27	-	-	-	-	-	-	-	-	-	-	✗
2026 Ml4acopf 2024	40	SAT	0.26	0.57	0.93	0.75	1.86	-	-	0.15	-	-	-	14.4	✗
2026 Ml4acopf 2024	41	UNSAT	2.05	0.90	-	11.8	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	42	UNSAT	2.21	0.23	-	11.8	-	-	-	-	32.7	-	-	-	-
2026 Ml4acopf 2024	43	UNSAT	2.14	0.25	-	11.8	-	-	-	-	32.6	-	-	-	-
2026 Ml4acopf 2024	44	UNSAT	2.21	0.22	1.24	13.7	-	-	-	-	31.3	-	-	-	-
2026 Ml4acopf 2024	45	UNSAT	2.14	0.23	2.80	11.8	-	-	-	-	32.5	-	-	-	-
2026 Ml4acopf 2024	46	UNSAT	2.06	1.93	1.36	11.9	-	-	-	59.1	64.5	-	-	-	-
2026 Ml4acopf 2024	47	UNSAT	2.14	0.23	1.50	12.0	-	-	-	-	32.4	-	-	-	-
2026 Ml4acopf 2024	48	UNSAT	2.17	0.22	1.34	11.9	-	-	-	8.69	32.5	-	-	-	-
2026 Ml4acopf 2024	49	UNSAT	2.14	0.22	1.27	11.9	-	-	-	8.61	32.9	-	-	-	-
2026 Ml4acopf 2024	50	UNSAT	2.14	0.22	1.27	11.8	-	-	-	8.62	32.5	-	-	-	-
2026 Ml4acopf 2024	51	UNSAT	2.16	0.23	-	12.1	-	-	-	-	99.4	-	-	-	-
2026 Ml4acopf 2024	52	UNSAT	2.38	1.85	1.34	-	-	-	-	47.5	201	-	-	-	-
2026 Ml4acopf 2024	53	UNSAT	2.15	0.22	-	11.8	-	-	-	-	32.6	-	-	-	-
2026 Ml4acopf 2024	54	UNSAT	2.15	0.22	1.22	11.9	-	-	-	8.63	32.7	-	-	-	-
2026 Ml4acopf 2024	55	UNSAT	2.14	0.23	-	12.0	-	-	-	-	33.4	-	-	-	-
2026 Ml4acopf 2024	56	UNSAT	73.5	9.82	-	-	-	-	-	-	-	-	-	-	✗
2026 Ml4acopf 2024	57	UNSAT	2.60	5.41	1.49	-	291	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	58	SAT	0.50	10.3	1.28	-	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	59	UNSAT	308	14.0	-	-	-	-	-	-	-	-	-	-	✗
2026 Ml4acopf 2024	60	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	61	UNSAT	19.8	4.93	-	-	-	-	-	-	-	-	-	-	✗
2026 Ml4acopf 2024	62	UNSAT	21.7	4.58	-	-	-	-	-	-	-	-	-	-	✗
2026 Ml4acopf 2024	63	UNSAT	2.48	1.23	-	12.1	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	64	UNSAT	2.44	1.22	-	12.1	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	65	UNSAT	21.7	33.4	2.49	-	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	66	UNSAT	2.34	3.54	1.74	12.6	-	-	-	-	66.3	-	-	-	-
2026 Ml4acopf 2024	67	SAT	0.56	4.95	1.06	-	-	-	-	-	-	-	-	-	-
2026 Ml4acopf 2024	68	UNSAT	8.80	11.7	3.38	-	-	-	-	-	-	-	-	-	-

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Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Nn4sys	0	UNSAT	1.16	3.31	0.85	5.62	-	-	-	5.00	-	-	-	-	-
2026 Nn4sys	1	UNSAT	0.72	3.18	0.91	4.84	-	-	-	2.70	19.3	-	-	-	-
2026 Nn4sys	2	UNSAT	1.01	2.73	0.88	5.69	-	-	-	5.00	-	-	-	-	-
2026 Nn4sys	3	UNSAT	0.51	3.26	0.75	4.73	5.88	-	-	2.49	18.9	-	-	-	-
2026 Nn4sys	4	UNSAT	0.69	3.25	0.92	4.82	-	-	-	2.73	19.4	-	-	-	-
2026 Nn4sys	5	UNSAT	1.00	2.76	0.88	5.63	-	-	-	5.20	-	-	-	-	-
2026 Nn4sys	6	UNSAT	0.72	3.15	0.94	4.86	-	-	-	2.67	19.4	-	-	-	-
2026 Nn4sys	7	UNSAT	1.45	3.70	1.11	6.27	-	-	-	4.90	-	-	-	-	-
2026 Nn4sys	8	UNSAT	0.72	3.14	0.93	4.86	-	-	-	2.81	19.4	-	-	-	-
2026 Nn4sys	9	UNSAT	0.71	3.21	0.97	4.84	-	-	-	2.69	19.6	-	-	-	-
2026 Nn4sys	10	UNSAT	0.71	3.27	0.93	4.94	-	-	-	2.70	19.2	-	-	-	-
2026 Nn4sys	11	UNSAT	0.73	3.26	0.94	4.82	-	-	-	2.66	19.9	-	-	-	-
2026 Nn4sys	12	UNSAT	0.72	3.28	0.97	4.87	-	-	-	2.87	19.4	-	-	-	-
2026 Nn4sys	13	UNSAT	0.53	3.07	0.75	4.71	5.72	-	-	2.47	18.8	-	-	-	-
2026 Nn4sys	14	UNSAT	1.00	2.76	0.92	5.61	-	-	-	4.99	-	-	-	-	-
2026 Nn4sys	15	UNSAT	1.03	2.69	0.93	5.63	-	-	-	4.99	-	-	-	-	-
2026 Nn4sys	16	UNSAT	0.71	3.10	0.92	4.76	-	-	-	2.70	19.4	-	-	-	-
2026 Nn4sys	17	UNSAT	1.31	3.33	1.09	6.14	-	-	-	4.94	-	-	-	-	-
2026 Nn4sys	18	UNSAT	0.52	2.99	0.76	4.73	5.76	-	-	2.51	18.8	-	-	-	-
2026 Nn4sys	19	UNSAT	0.72	3.21	0.96	4.80	-	-	-	2.66	19.7	-	-	-	-
2026 Nn4sys	20	UNSAT	0.72	3.19	0.91	4.86	-	-	-	2.75	19.6	-	-	-	-
2026 Nn4sys	21	UNSAT	0.53	3.08	0.78	4.75	5.74	-	-	2.53	18.5	-	-	-	-
2026 Nn4sys	22	UNSAT	0.73	3.20	0.92	4.88	-	-	-	2.75	19.4	-	-	-	-
2026 Nn4sys	23	UNSAT	0.51	3.07	0.77	4.77	5.77	-	-	2.54	18.8	-	-	-	-
2026 Nn4sys	24	UNSAT	1.30	3.33	1.07	6.19	-	-	-	4.63	-	-	-	-	-
2026 Nn4sys	25	UNSAT	0.73	3.19	0.93	4.84	-	-	-	2.68	19.5	-	-	-	-
2026 Nn4sys	26	UNSAT	0.72	3.30	0.90	4.99	-	-	-	2.82	19.4	-	-	-	-
2026 Nn4sys	27	UNSAT	0.71	3.29	0.89	4.87	-	-	-	2.68	19.5	-	-	-	-
2026 Nn4sys	28	UNSAT	1.30	3.34	1.09	6.18	-	-	-	4.81	-	-	-	-	-
2026 Nn4sys	29	UNSAT	0.51	3.02	0.76	4.78	5.77	-	-	2.49	18.8	-	-	-	-
2026 Nn4sys	30	UNSAT	0.52	3.07	0.76	4.70	5.70	-	-	2.48	19.1	-	-	-	-
2026 Nn4sys	31	UNSAT	0.72	3.28	0.87	5.00	-	-	-	2.70	19.5	-	-	-	-
2026 Nn4sys	32	UNSAT	0.71	3.20	0.91	4.83	-	-	-	2.67	19.4	-	-	-	-
2026 Nn4sys	33	UNSAT	0.71	3.19	0.93	4.92	-	-	-	2.70	19.7	-	-	-	-
2026 Nn4sys	34	UNSAT	0.71	3.18	0.93	4.85	-	-	-	2.83	19.5	-	-	-	-
2026 Nn4sys	35	UNSAT	4.96	4.54	1.62	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	36	UNSAT	4.71	3.76	1.49	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	37	UNSAT	4.62	3.80	1.72	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	38	UNSAT	4.73	3.89	1.75	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	39	UNSAT	4.49	3.76	1.61	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	40	UNSAT	4.39	3.65	1.63	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	41	UNSAT	5.01	3.68	1.59	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	42	UNSAT	4.62	3.79	1.51	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	43	UNSAT	4.46	3.75	1.47	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	44	UNSAT	4.68	3.80	1.59	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	45	UNSAT	4.42	4.01	1.63	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	46	UNSAT	4.43	4.00	1.63	-	-	-	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Nn4sys	47	UNSAT	4.17	3.85	1.49	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	48	UNSAT	4.44	3.96	1.45	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	49	UNSAT	4.62	3.71	1.61	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	50	UNSAT	4.17	3.64	1.66	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	51	UNSAT	4.10	3.61	1.47	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	52	UNSAT	4.43	3.62	1.60	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	53	UNSAT	4.65	4.75	1.62	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	54	UNSAT	4.43	3.79	1.70	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	55	UNSAT	4.70	3.80	1.52	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	56	UNSAT	4.69	3.69	1.52	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	57	UNSAT	4.43	3.74	1.62	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	58	UNSAT	4.71	3.63	1.59	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	59	UNSAT	4.73	3.88	1.45	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	60	UNSAT	4.70	3.86	1.50	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	61	UNSAT	4.48	4.04	1.76	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	62	UNSAT	5.00	3.76	1.64	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	63	UNSAT	4.41	3.70	1.61	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	64	UNSAT	4.44	3.98	1.97	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	65	UNSAT	4.69	3.68	1.46	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	66	UNSAT	4.17	3.75	1.60	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	67	UNSAT	4.20	3.64	1.62	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	68	UNSAT	4.67	3.78	1.62	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	69	UNSAT	4.17	3.61	1.61	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	70	UNSAT	5.78	4.92	2.10	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	71	UNSAT	5.04	3.79	1.62	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	72	UNSAT	4.95	3.87	1.71	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	73	UNSAT	4.71	3.73	1.45	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	74	UNSAT	4.73	4.20	1.60	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	75	UNSAT	5.00	3.85	1.49	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	76	UNSAT	5.40	3.82	1.64	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	77	UNSAT	5.02	4.29	1.61	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	78	UNSAT	5.35	3.94	1.49	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	79	UNSAT	4.68	3.93	1.62	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	80	UNSAT	5.29	4.07	1.71	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	81	UNSAT	4.73	3.64	1.65	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	82	UNSAT	4.76	3.81	1.61	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	83	UNSAT	4.96	4.01	1.49	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	84	UNSAT	5.38	4.09	1.63	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	85	UNSAT	4.71	3.89	1.49	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	86	UNSAT	4.99	4.30	1.70	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	87	UNSAT	5.00	4.24	1.75	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	88	UNSAT	4.97	4.27	1.46	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	89	UNSAT	4.95	3.86	1.48	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	90	UNSAT	5.40	4.16	1.75	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	91	UNSAT	5.35	4.53	1.60	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	92	UNSAT	5.07	3.80	1.63	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	93	UNSAT	4.75	3.77	1.74	-	-	-	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Nn4sys	94	UNSAT	5.00	3.84	1.46	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	95	UNSAT	4.73	3.75	1.49	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	96	UNSAT	4.99	3.96	1.48	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	97	UNSAT	4.66	3.85	1.48	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	98	UNSAT	5.50	3.86	1.91	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	99	UNSAT	5.06	4.38	2.12	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	100	UNSAT	5.34	3.99	1.62	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	101	UNSAT	5.01	4.02	1.75	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	102	UNSAT	5.05	3.90	1.47	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	103	UNSAT	5.05	3.73	1.65	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	104	UNSAT	4.73	3.70	1.64	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	105	UNSAT	0.22	1.34	0.55	4.02	0.03	-	-	1.04	-	-	0.41	-	-
2026 Nn4sys	106	UNSAT	0.31	1.50	0.54	4.12	<0.01	-	-	1.33	-	-	0.32	-	-
2026 Nn4sys	107	UNSAT	0.22	0.74	0.78	4.03	0.09	-	-	-	-	-	0.73	-	-
2026 Nn4sys	108	UNSAT	0.28	0.75	0.78	4.03	0.07	-	-	-	-	-	0.89	-	-
2026 Nn4sys	109	UNSAT	0.21	0.83	0.87	4.32	0.03	-	-	-	-	-	1.83	-	-
2026 Nn4sys	110	UNSAT	0.31	0.84	0.96	4.38	0.08	-	-	-	-	-	1.38	-	-
2026 Nn4sys	111	UNSAT	0.23	0.86	1.03	4.70	0.06	-	-	-	-	-	1.45	-	-
2026 Nn4sys	112	UNSAT	0.28	0.85	1.06	4.81	0.19	-	-	-	-	-	1.98	-	-
2026 Nn4sys	113	UNSAT	0.22	0.90	1.27	4.96	0.09	-	-	-	-	-	1.78	-	-
2026 Nn4sys	114	UNSAT	0.30	0.90	1.29	5.07	0.07	-	-	-	-	-	2.42	-	-
2026 Nn4sys	115	UNSAT	0.21	0.93	1.37	5.25	0.06	-	-	-	-	-	2.21	-	-
2026 Nn4sys	116	UNSAT	0.31	0.93	1.39	5.33	0.11	-	-	-	-	-	3.01	-	-
2026 Nn4sys	117	UNSAT	0.26	1.34	2.46	8.91	0.19	-	-	-	-	-	5.77	-	-
2026 Nn4sys	118	UNSAT	0.32	1.33	2.48	9.06	0.47	-	-	-	-	-	8.84	-	-
2026 Nn4sys	119	UNSAT	0.36	1.65	3.43	13.1	0.20	-	-	-	-	-	9.43	-	-
2026 Nn4sys	120	UNSAT	0.38	1.67	3.56	13.3	0.34	-	-	-	-	-	13.6	-	-
2026 Nn4sys	121	UNSAT	0.39	2.08	4.52	17.7	0.27	-	-	-	-	-	13.1	-	-
2026 Nn4sys	122	UNSAT	0.41	2.09	4.60	18.0	0.80	-	-	-	-	-	20.0	-	-
2026 Nn4sys	123	UNSAT	0.43	2.38	5.45	22.3	0.26	-	-	-	-	-	16.8	-	-
2026 Nn4sys	124	UNSAT	0.45	2.42	5.54	22.3	0.87	-	-	-	-	-	24.7	-	-
2026 Nn4sys	125	UNSAT	0.63	2.62	6.04	24.7	0.29	-	-	-	-	-	18.6	-	-
2026 Nn4sys	126	UNSAT	0.68	2.67	6.24	25.1	0.97	-	-	-	-	-	26.9	-	-
2026 Nn4sys	127	UNSAT	2.20	11.9	33.2	-	1.31	-	-	-	-	-	-	-	-
2026 Nn4sys	128	UNSAT	2.31	11.9	32.4	-	3.20	-	-	-	-	-	-	-	-
2026 Nn4sys	129	UNSAT	0.80	2.66	0.80	4.83	-	-	-	-	-	-	-	-	-
2026 Nn4sys	130	UNSAT	1.33	2.92	2.74	7.46	-	-	-	-	-	-	-	-	-
2026 Nn4sys	131	UNSAT	1.25	3.25	3.51	9.08	-	-	-	-	-	-	-	-	-
2026 Nn4sys	132	UNSAT	1.35	3.36	4.16	10.5	-	-	-	-	-	-	-	-	-
2026 Nn4sys	133	UNSAT	1.55	3.93	6.93	15.7	-	-	-	-	-	-	-	-	-
2026 Nn4sys	134	UNSAT	1.62	4.20	8.30	19.4	-	-	-	-	-	-	-	-	-
2026 Nn4sys	135	UNSAT	1.69	4.52	10.2	22.9	-	-	-	-	-	-	-	-	-
2026 Nn4sys	136	UNSAT	1.80	4.87	11.6	25.9	-	-	-	-	-	-	-	-	-
2026 Nn4sys	137	UNSAT	1.57	4.42	2.15	5.77	-	-	-	-	-	-	-	-	✗
2026 Nn4sys	138	UNSAT	2.54	5.32	8.58	9.66	-	-	-	-	-	-	-	-	-
2026 Nn4sys	139	UNSAT	2.38	6.64	10.5	9.23	-	-	-	-	-	-	-	-	-
2026 Nn4sys	140	UNSAT	2.80	7.64	12.4	9.78	-	-	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Nn4sys	141	UNSAT	2.71	8.86	12.9	10.1	-	-	-	-	-	-	-	-	-
2026 Nn4sys	142	UNSAT	2.53	10.1	14.5	12.4	-	-	-	-	-	-	-	-	-
2026 Nn4sys	143	UNSAT	2.67	11.3	14.9	12.9	-	-	-	-	-	-	-	-	-
2026 Nn4sys	144	UNSAT	2.76	12.6	17.4	13.4	-	-	-	-	-	-	-	-	-
2026 Nn4sys	145	UNSAT	3.19	27.3	34.5	24.2	-	-	-	-	-	-	-	-	-
2026 Nn4sys	146	UNSAT	3.51	35.8	43.2	26.7	-	-	-	-	-	-	-	-	-
2026 Nn4sys	147	UNSAT	3.78	42.5	50.6	31.2	-	-	-	-	-	-	-	-	-
2026 Nn4sys	148	UNSAT	4.15	50.1	61.7	35.2	-	-	-	-	-	-	-	-	-
2026 Nn4sys	149	UNSAT	4.29	57.8	67.5	37.9	-	-	-	-	-	-	-	-	-
2026 Nn4sys	150	UNSAT	4.26	65.1	78.8	40.9	-	-	-	-	-	-	-	-	-
2026 Nn4sys	151	UNSAT	4.82	69.8	85.6	45.2	-	-	-	-	-	-	-	-	-
2026 Nn4sys	152	UNSAT	5.11	77.3	91.3	47.4	-	-	-	-	-	-	-	-	-
2026 Nn4sys	153	UNSAT	5.23	86.2	99.5	50.9	-	-	-	-	-	-	-	-	-
2026 Nn4sys	154	UNSAT	5.54	91.5	111	54.2	-	-	-	-	-	-	-	-	-
2026 Nn4sys	155	UNSAT	5.66	100	117	58.0	-	-	-	-	-	-	-	-	-
2026 Nn4sys	156	UNSAT	5.96	106	126	62.2	-	-	-	-	-	-	-	-	-
2026 Nn4sys	157	UNSAT	16.6	114	133	64.7	-	-	-	-	-	-	-	-	-
2026 Nn4sys	158	UNSAT	17.3	122	144	68.7	-	-	-	-	-	-	-	-	-
2026 Nn4sys	159	UNSAT	18.3	27.6	153	71.0	-	-	-	-	-	-	-	-	-
2026 Nn4sys	160	UNSAT	2.52	-	5.33	7.40	-	-	-	-	-	-	-	-	-
2026 Nn4sys	161	UNSAT	3.43	-	-	-	-	-	-	-	-	-	-	-	-
2026 Nn4sys	162	UNSAT	3.79	21.8	-	13.6	-	-	-	-	-	-	-	-	-
2026 Nn4sys	163	UNSAT	4.27	22.7	-	15.7	-	-	-	-	-	-	-	-	-
2026 Nn4sys	164	UNSAT	6.52	27.8	-	21.7	-	-	-	-	-	-	-	-	-
2026 Nn4sys	165	UNSAT	7.60	29.5	-	26.1	-	-	-	-	-	-	-	-	-
2026 Nn4sys	166	UNSAT	8.48	31.7	-	68.4	-	-	-	-	-	-	-	-	-
2026 Nn4sys	167	UNSAT	9.14	33.9	-	34.3	-	-	-	-	-	-	-	-	-
2026 Nn4sys	168	UNSAT	10.5	36.4	-	39.6	-	-	-	-	-	-	-	-	-
2026 Nn4sys	169	UNSAT	11.1	38.3	-	43.4	-	-	-	-	-	-	-	-	-
2026 Nn4sys	170	UNSAT	12.1	39.8	-	48.2	-	-	-	-	-	-	-	-	-
2026 Nn4sys	171	UNSAT	3.86	-	7.60	8.42	-	-	-	-	-	-	-	-	-
2026 Nn4sys	172	UNSAT	5.21	43.8	134	17.9	-	-	-	-	-	-	-	-	-
2026 Nn4sys	173	UNSAT	6.19	50.4	-	19.9	-	-	-	-	-	-	-	-	-
2026 Nn4sys	174	UNSAT	6.81	56.3	-	23.3	-	-	-	-	-	-	-	-	-
2026 Nn4sys	175	UNSAT	8.52	61.4	-	23.8	-	-	-	-	-	-	-	-	-
2026 Nn4sys	176	UNSAT	9.35	65.7	-	27.5	-	-	-	-	-	-	-	-	-
2026 Nn4sys	177	UNSAT	9.42	70.6	-	27.9	-	-	-	-	-	-	-	-	-
2026 Nn4sys	178	UNSAT	10.7	74.6	-	29.9	-	-	-	-	-	-	-	-	-
2026 Nn4sys	179	UNSAT	18.8	132	-	37.5	-	-	-	-	-	-	-	-	-
2026 Nn4sys	180	UNSAT	22.4	152	-	43.2	-	-	-	-	-	-	-	-	-
2026 Nn4sys	181	UNSAT	25.4	176	-	52.0	-	-	-	-	-	-	-	-	-
2026 Nn4sys	182	UNSAT	28.3	200	-	59.4	-	-	-	-	-	-	-	-	-
2026 Nn4sys	183	UNSAT	34.8	225	-	67.7	-	-	-	-	-	-	-	-	-
2026 Nn4sys	184	UNSAT	40.8	253	-	77.4	-	-	-	-	-	-	-	-	-
2026 Nn4sys	185	UNSAT	38.0	269	-	80.4	-	-	-	-	-	-	-	-	-
2026 Nn4sys	186	UNSAT	45.4	291	-	88.2	-	-	-	-	-	-	-	-	-
2026 Nn4sys	187	UNSAT	48.7	-	-	99.8	-	-	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Nn4sys	188	UNSAT	55.9	-	-	108	-	-	-	-	-	-	-	-	-
2026 Nn4sys	189	UNSAT	60.6	-	-	120	-	-	-	-	-	-	-	-	-
2026 Nn4sys	190	UNSAT	60.7	-	-	129	-	-	-	-	-	-	-	-	-
2026 Nn4sys	191	UNSAT	70.9	-	-	134	-	-	-	-	-	-	-	-	-
2026 Nn4sys	192	UNSAT	69.7	-	-	141	-	-	-	-	-	-	-	-	-
2026 Nn4sys	193	UNSAT	75.0	-	-	148	-	-	-	-	-	-	-	-	-
2026 Relusplitter 2026	0	UNSAT	0.94	3.01	1.80	11.1	8.73	-	1.78	-	22.4	10.1	-	-	-
2026 Relusplitter 2026	1	UNSAT	0.95	3.00	1.99	14.4	9.05	-	6.37	-	-	11.2	-	-	-
2026 Relusplitter 2026	2	UNSAT	0.95	3.01	2.02	10.9	8.88	-	2.24	-	-	11.4	-	-	-
2026 Relusplitter 2026	3	UNSAT	0.95	2.96	4.33	21.0	-	-	178	-	-	11.6	-	-	-
2026 Relusplitter 2026	4	UNSAT	0.95	2.97	39.4	-	-	-	-	-	-	11.3	-	-	-
2026 Relusplitter 2026	5	UNSAT	0.96	2.97	-	-	-	-	-	-	-	11.6	-	-	-
2026 Relusplitter 2026	6	UNSAT	1.04	3.04	1.99	10.9	8.86	-	2.05	3.71	23.8	12.8	-	-	-
2026 Relusplitter 2026	7	UNSAT	1.03	3.06	2.18	11.0	9.14	-	2.57	-	-	13.8	-	-	-
2026 Relusplitter 2026	8	UNSAT	1.06	3.07	2.21	11.0	9.08	-	2.58	-	-	14.7	-	-	-
2026 Relusplitter 2026	9	UNSAT	1.05	3.06	2.15	11.0	9.10	-	2.58	-	25.0	14.9	-	-	-
2026 Relusplitter 2026	10	UNSAT	1.05	3.05	2.18	11.0	9.12	-	2.59	-	-	14.7	-	-	-
2026 Relusplitter 2026	11	UNSAT	1.07	3.06	2.16	11.0	9.13	-	2.61	-	25.5	14.3	-	-	-
2026 Relusplitter 2026	12	UNSAT	1.25	7.75	1.96	15.4	5.55	-	12.8	-	73.2	29.5	-	-	-
2026 Relusplitter 2026	13	UNSAT	1.34	7.94	-	98.6	-	-	-	-	-	30.3	-	-	-
2026 Relusplitter 2026	14	UNSAT	1.33	7.84	-	113	-	-	-	-	-	31.1	-	-	-
2026 Relusplitter 2026	15	UNSAT	1.34	7.96	-	121	-	-	-	-	-	30.1	-	-	-
2026 Relusplitter 2026	16	UNSAT	1.32	7.88	-	-	-	-	-	-	-	31.2	-	-	-
2026 Relusplitter 2026	17	UNSAT	1.34	7.79	-	-	-	-	-	-	-	30.3	-	-	-
2026 Relusplitter 2026	18	UNSAT	1.05	4.41	2.00	10.9	8.95	-	2.04	-	24.6	13.5	-	-	-
2026 Relusplitter 2026	19	UNSAT	1.04	4.52	3.19	22.7	-	-	53.0	-	-	14.5	-	-	-
2026 Relusplitter 2026	20	UNSAT	1.05	4.52	10.9	27.3	-	-	-	-	-	14.5	-	-	-
2026 Relusplitter 2026	21	UNSAT	1.06	4.53	-	87.1	-	-	-	-	-	14.4	-	-	-
2026 Relusplitter 2026	22	UNSAT	1.05	4.46	-	-	-	-	-	-	-	14.5	-	-	-
2026 Relusplitter 2026	23	UNSAT	1.06	4.61	-	-	-	-	-	-	-	15.2	-	-	-
2026 Relusplitter 2026	24	UNSAT	0.87	2.95	1.78	10.8	5.26	-	1.73	1.17	23.1	10.0	-	-	-
2026 Relusplitter 2026	25	UNSAT	0.95	2.96	2.01	10.9	8.83	-	2.24	3.05	-	11.3	-	-	-
2026 Relusplitter 2026	26	UNSAT	0.96	2.97	2.00	10.9	8.93	-	2.24	-	-	11.5	-	-	-
2026 Relusplitter 2026	27	UNSAT	0.97	2.96	2.00	10.9	8.87	-	2.23	-	23.3	11.2	-	-	-
2026 Relusplitter 2026	28	UNSAT	0.96	2.95	2.01	10.9	8.90	-	2.23	-	-	11.1	-	-	-
2026 Relusplitter 2026	29	UNSAT	0.95	2.93	2.02	10.9	8.85	-	2.24	-	24.2	11.4	-	-	-
2026 Relusplitter 2026	30	SAT	0.41	0.94	0.73	1.00	-	-	0.88	0.30	0.24	9.54	-	-	✗
2026 Relusplitter 2026	31	SAT	0.42	0.97	0.77	1.05	-	-	1.11	0.16	0.25	11.7	-	-	✗
2026 Relusplitter 2026	32	SAT	0.42	0.97	0.76	1.10	-	-	1.13	0.35	0.26	11.7	-	-	✗
2026 Relusplitter 2026	33	SAT	0.40	0.96	0.78	1.06	-	-	1.11	0.17	0.24	11.4	-	-	✗
2026 Relusplitter 2026	34	SAT	0.41	0.94	0.76	1.08	-	-	1.13	0.34	0.25	11.3	-	-	✗
2026 Relusplitter 2026	35	SAT	0.42	0.94	0.81	1.04	-	-	1.10	0.33	0.25	11.4	-	-	✗
2026 Relusplitter 2026	36	UNSAT	0.96	3.06	1.97	10.9	5.26	-	2.03	-	23.9	12.6	-	-	-
2026 Relusplitter 2026	37	UNSAT	1.06	3.04	2.19	11.0	9.12	-	2.58	-	-	14.9	-	-	-
2026 Relusplitter 2026	38	UNSAT	1.05	3.07	2.22	11.0	9.06	-	2.57	-	-	14.4	-	-	-
2026 Relusplitter 2026	39	UNSAT	1.06	3.05	2.20	11.0	9.02	-	2.57	-	25.9	14.0	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Relusplitter 2026	40	UNSAT	1.06	3.07	2.23	11.0	9.10	-	2.58	-	-	14.8	-	-	-
2026 Relusplitter 2026	41	UNSAT	1.05	3.07	2.23	15.5	9.20	-	12.3	-	65.9	14.7	-	-	-
2026 Relusplitter 2026	42	UNSAT	0.98	3.43	2.01	10.9	5.36	-	2.02	-	24.2	13.1	-	-	-
2026 Relusplitter 2026	43	UNSAT	1.08	3.41	3.70	24.7	-	-	-	-	-	14.9	-	-	-
2026 Relusplitter 2026	44	UNSAT	1.05	3.36	7.00	36.5	-	-	-	-	-	14.6	-	-	-
2026 Relusplitter 2026	45	UNSAT	1.07	3.42	18.1	71.3	-	-	-	-	-	14.8	-	-	-
2026 Relusplitter 2026	46	UNSAT	1.05	3.41	99.8	101	-	-	-	-	-	14.3	-	-	-
2026 Relusplitter 2026	47	UNSAT	1.05	3.42	60.5	113	-	-	-	-	-	14.7	-	-	-
2026 Relusplitter 2026	48	SAT	0.36	0.96	0.81	1.03	-	-	0.94	0.25	0.35	-	-	-	-
2026 Relusplitter 2026	49	SAT	0.43	0.98	0.79	1.19	-	-	1.21	0.46	0.65	-	-	-	-
2026 Relusplitter 2026	50	SAT	0.42	0.98	0.85	1.12	-	-	1.18	0.30	0.64	-	-	-	-
2026 Relusplitter 2026	51	SAT	0.42	0.98	0.80	1.15	-	-	1.16	0.43	0.59	-	-	-	-
2026 Relusplitter 2026	52	SAT	0.44	0.99	0.80	1.06	-	-	1.16	0.26	0.48	-	-	-	-
2026 Relusplitter 2026	53	SAT	0.42	0.99	0.79	1.09	-	-	1.17	0.43	0.47	-	-	-	-
2026 Relusplitter 2026	54	UNSAT	22.0	25.6	18.5	27.9	-	-	-	-	-	-	-	-	-
2026 Relusplitter 2026	55	UNSAT	20.0	25.1	-	112	-	-	-	-	-	-	-	-	-
2026 Relusplitter 2026	56	UNSAT	22.2	25.5	-	138	-	-	-	-	-	-	-	-	-
2026 Relusplitter 2026	57	UNSAT	21.8	25.2	-	154	-	-	-	-	-	-	-	-	-
2026 Relusplitter 2026	58	UNSAT	21.8	24.9	-	-	-	-	-	-	-	-	-	-	-
2026 Relusplitter 2026	59	UNSAT	22.0	25.7	-	-	-	-	-	-	-	-	-	-	-
2026 Relusplitter 2026	60	UNSAT	0.98	3.10	2.06	10.9	5.30	-	2.06	-	24.3	12.9	-	-	-
2026 Relusplitter 2026	61	UNSAT	1.06	3.12	2.17	11.0	9.07	-	2.59	-	-	14.4	-	-	-
2026 Relusplitter 2026	62	UNSAT	1.05	3.11	2.21	11.0	9.10	-	2.56	-	-	14.8	-	-	-
2026 Relusplitter 2026	63	UNSAT	1.04	3.12	2.18	16.5	-	-	31.6	-	105	14.9	-	-	-
2026 Relusplitter 2026	64	UNSAT	1.06	3.09	102	133	-	-	-	-	-	14.2	-	-	-
2026 Relusplitter 2026	65	UNSAT	1.06	3.10	-	151	-	-	-	-	-	14.5	-	-	-
2026 Relusplitter 2026	66	UNSAT	0.88	2.97	1.81	10.9	5.22	-	1.73	1.04	24.7	9.49	-	-	-
2026 Relusplitter 2026	67	UNSAT	0.95	2.98	1.98	10.9	8.95	-	2.21	1.40	-	11.3	-	-	-
2026 Relusplitter 2026	68	UNSAT	0.95	2.97	1.97	11.0	8.92	-	2.23	1.97	-	11.2	-	-	-
2026 Relusplitter 2026	69	UNSAT	0.96	2.98	2.01	10.9	8.86	-	2.24	3.52	23.4	11.5	-	-	-
2026 Relusplitter 2026	70	UNSAT	0.94	3.00	2.00	10.9	8.94	-	2.24	6.85	-	10.9	-	-	-
2026 Relusplitter 2026	71	UNSAT	0.96	3.00	2.02	10.9	8.87	-	2.21	-	24.3	11.0	-	-	-
2026 Relusplitter 2026	72	SAT	0.36	0.96	0.73	1.01	6.66	-	0.95	0.27	0.21	13.0	-	-	✗
2026 Relusplitter 2026	73	SAT	0.44	0.96	0.80	1.08	10.3	-	1.15	0.28	0.19	14.4	-	-	✗
2026 Relusplitter 2026	74	SAT	0.44	0.98	0.80	1.10	10.4	-	1.17	0.28	0.20	14.0	-	-	✗
2026 Relusplitter 2026	75	SAT	0.44	0.99	0.79	1.05	10.4	-	1.16	0.34	0.19	14.0	-	-	✗
2026 Relusplitter 2026	76	SAT	0.45	0.99	0.79	1.06	10.3	-	1.17	0.26	0.20	14.2	-	-	✗
2026 Relusplitter 2026	77	SAT	0.44	0.98	0.76	1.07	10.3	-	1.15	0.27	0.18	14.1	-	-	✗
2026 Relusplitter 2026	78	UNSAT	0.98	4.49	2.02	10.9	5.36	-	2.03	-	23.3	12.6	-	-	-
2026 Relusplitter 2026	79	UNSAT	1.06	4.53	2.17	16.5	-	-	17.1	-	-	14.5	-	-	-
2026 Relusplitter 2026	80	UNSAT	1.08	4.50	4.69	23.9	-	-	-	-	-	14.2	-	-	-
2026 Relusplitter 2026	81	UNSAT	1.06	4.53	-	78.7	-	-	-	-	-	14.8	-	-	-
2026 Relusplitter 2026	82	UNSAT	1.04	4.51	-	131	-	-	-	-	-	14.7	-	-	-
2026 Relusplitter 2026	83	UNSAT	1.07	4.53	-	154	-	-	-	-	-	14.2	-	-	-
2026 Relusplitter 2026	84	SAT	0.34	0.95	0.76	1.01	-	-	0.89	0.30	0.22	9.55	-	-	✗
2026 Relusplitter 2026	85	SAT	0.42	0.95	0.75	1.05	-	-	1.12	0.31	0.20	11.6	-	-	✗
2026 Relusplitter 2026	86	SAT	0.42	0.96	0.78	1.08	-	-	1.12	0.29	0.21	11.5	-	-	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Relusplitter 2026	87	SAT	0.42	0.96	0.74	1.08	-	-	1.14	0.31	0.22	11.6	-	-	✗
2026 Relusplitter 2026	88	SAT	0.41	0.96	0.73	1.07	-	-	1.13	0.28	0.21	11.2	-	-	✗
2026 Relusplitter 2026	89	SAT	0.42	0.97	0.76	1.06	-	-	1.12	0.31	0.24	11.4	-	-	✗
2026 Relusplitter 2026	90	UNSAT	0.98	3.10	2.01	10.9	5.29	-	2.03	-	23.8	13.2	-	-	-
2026 Relusplitter 2026	91	UNSAT	1.05	3.11	2.16	11.0	9.00	-	2.59	-	-	14.2	-	-	-
2026 Relusplitter 2026	92	UNSAT	1.05	3.11	2.18	11.1	9.16	-	2.58	-	-	14.4	-	-	-
2026 Relusplitter 2026	93	UNSAT	1.04	3.11	2.19	11.0	9.13	-	2.59	-	24.8	14.1	-	-	-
2026 Relusplitter 2026	94	UNSAT	1.05	3.08	4.25	22.3	-	-	70.8	-	-	14.8	-	-	-
2026 Relusplitter 2026	95	UNSAT	1.06	3.08	2.16	16.2	-	-	27.3	-	110	14.0	-	-	-
2026 Relusplitter 2026	96	UNSAT	18.0	7.47	3.62	19.1	-	-	37.5	-	-	61.7	-	-	-
2026 Relusplitter 2026	97	UNSAT	18.4	7.60	-	107	-	-	-	-	-	64.1	-	-	-
2026 Relusplitter 2026	98	UNSAT	15.1	7.63	-	120	-	-	-	-	-	63.1	-	-	-
2026 Relusplitter 2026	99	UNSAT	17.3	7.55	-	142	-	-	-	-	-	63.1	-	-	-
2026 Relusplitter 2026	100	UNSAT	17.8	7.50	-	-	-	-	-	-	-	63.5	-	-	-
2026 Relusplitter 2026	101	UNSAT	17.0	7.53	-	-	-	-	-	-	-	63.5	-	-	-
2026 Relusplitter 2026	102	UNSAT	15.9	7.38	2.49	19.1	8.57	-	19.8	-	-	30.4	-	-	-
2026 Relusplitter 2026	103	UNSAT	15.7	7.37	27.3	45.2	-	-	-	-	-	32.1	-	-	-
2026 Relusplitter 2026	104	UNSAT	38.4	7.46	175	91.3	-	-	-	-	-	32.4	-	-	-
2026 Relusplitter 2026	105	UNSAT	65.1	7.42	-	101	-	-	-	-	-	32.6	-	-	-
2026 Relusplitter 2026	106	UNSAT	16.0	7.40	-	-	-	-	-	-	-	31.8	-	-	-
2026 Relusplitter 2026	107	UNSAT	15.7	7.38	-	-	-	-	-	-	-	32.4	-	-	-
2026 Relusplitter 2026	108	UNSAT	0.97	3.05	2.00	11.0	5.40	-	2.03	2.83	24.6	12.7	-	-	-
2026 Relusplitter 2026	109	UNSAT	1.06	3.08	2.12	11.1	9.00	-	2.57	-	-	14.9	-	-	-
2026 Relusplitter 2026	110	UNSAT	1.03	3.06	2.21	11.0	9.10	-	2.57	-	-	14.8	-	-	-
2026 Relusplitter 2026	111	UNSAT	1.04	3.07	2.24	11.1	9.08	-	2.58	-	25.2	14.0	-	-	-
2026 Relusplitter 2026	112	UNSAT	1.06	3.06	2.27	11.1	9.05	-	2.60	-	-	14.6	-	-	-
2026 Relusplitter 2026	113	UNSAT	1.06	3.07	2.19	11.0	9.05	-	2.58	-	25.4	14.1	-	-	-
2026 Relusplitter 2026	114	UNSAT	1.01	3.08	1.98	10.9	5.32	-	2.06	-	24.5	12.3	-	-	-
2026 Relusplitter 2026	115	UNSAT	1.05	3.07	2.11	11.0	9.10	-	2.57	-	-	14.8	-	-	-
2026 Relusplitter 2026	116	UNSAT	1.05	3.07	2.16	11.0	9.15	-	2.56	-	-	15.0	-	-	-
2026 Relusplitter 2026	117	UNSAT	1.05	3.08	2.17	11.0	9.08	-	2.58	-	25.0	13.9	-	-	-
2026 Relusplitter 2026	118	UNSAT	1.05	3.07	2.15	11.0	9.05	-	2.61	-	-	14.2	-	-	-
2026 Relusplitter 2026	119	UNSAT	1.04	3.06	2.12	11.0	9.06	-	2.58	-	27.1	14.7	-	-	-
2026 Safenlp 2024	0	SAT	0.79	1.00	0.66	2.80	-	1.03	0.15	0.19	0.15	0.91	0.26	-	✗
2026 Safenlp 2024	1	UNSAT	0.12	0.74	0.76	2.18	-	0.21	0.40	0.40	3.55	0.89	0.13	-	0.42
2026 Safenlp 2024	2	UNSAT	0.11	0.74	0.82	2.10	11.2	0.82	0.33	0.40	3.53	-	0.14	-	0.06
2026 Safenlp 2024	3	UNSAT	1.38	1.85	4.92	2.61	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	4	SAT	0.60	0.97	0.63	0.07	8.22	0.41	0.09	0.20	0.12	0.86	0.24	0.53	✗
2026 Safenlp 2024	5	SAT	0.62	0.99	0.60	3.72	6.92	1.23	0.11	0.31	0.13	-	0.71	-	✗
2026 Safenlp 2024	6	SAT	0.44	0.98	0.63	3.70	6.68	1.64	0.10	0.44	0.14	-	-	-	✗
2026 Safenlp 2024	7	SAT	0.64	0.99	0.70	0.23	5.30	0.41	0.11	0.20	0.12	0.86	0.17	0.55	✗
2026 Safenlp 2024	8	SAT	0.60	0.97	0.63	0.12	4.25	0.41	0.10	0.20	0.14	0.88	0.18	-	✗
2026 Safenlp 2024	9	SAT	0.62	0.99	0.64	2.18	5.20	0.42	0.10	0.20	0.13	0.85	0.23	-	✗
2026 Safenlp 2024	10	SAT	0.61	0.99	0.67	3.98	6.19	6.77	0.10	0.24	0.14	-	0.48	-	✗
2026 Safenlp 2024	11	SAT	0.63	0.97	0.63	3.98	8.10	-	0.12	0.04	0.12	-	-	-	✗
2026 Safenlp 2024	12	SAT	0.58	0.98	0.67	✗	5.61	0.41	0.09	0.17	0.12	0.86	0.18	-	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	13	SAT	0.43	0.98	0.63	✗	5.45	0.41	0.09	0.20	0.10	0.86	0.18	-	✗
2026 Safenlp 2024	14	SAT	0.60	0.99	0.62	0.10	5.23	0.41	0.11	0.16	0.17	0.89	0.19	0.43	✗
2026 Safenlp 2024	15	SAT	0.53	0.99	0.67	3.91	-	5.33	0.12	0.24	0.19	-	-	-	✗
2026 Safenlp 2024	16	UNSAT	6.19	7.74	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	17	SAT	0.63	0.98	0.65	✗	5.38	0.41	0.10	0.19	0.13	0.86	0.19	-	✗
2026 Safenlp 2024	18	UNSAT	0.15	0.74	0.78	2.13	10.9	0.21	0.35	0.26	3.56	0.86	0.11	-	0.41
2026 Safenlp 2024	19	SAT	0.38	0.98	0.60	3.79	-	-	0.12	-	0.14	-	0.36	-	✗
2026 Safenlp 2024	20	UNSAT	0.97	1.43	0.94	2.30	11.0	1.85	3.52	-	-	-	0.65	-	6.60
2026 Safenlp 2024	21	SAT	0.63	0.98	0.62	2.15	5.30	1.03	0.11	0.16	0.15	0.94	0.19	-	✗
2026 Safenlp 2024	22	UNSAT	0.13	0.73	0.76	2.12	10.9	0.21	0.33	0.42	3.57	0.84	0.14	-	0.41
2026 Safenlp 2024	23	SAT	0.64	0.97	0.63	4.69	6.71	8.41	0.12	0.26	0.12	-	-	-	✗
2026 Safenlp 2024	24	SAT	0.54	0.97	0.62	2.33	5.43	0.41	0.11	0.21	0.14	0.84	0.22	-	✗
2026 Safenlp 2024	25	SAT	0.62	0.98	0.63	2.19	5.37	0.41	0.10	0.19	0.14	0.85	0.19	-	✗
2026 Safenlp 2024	26	SAT	0.36	0.99	0.63	2.51	-	-	0.10	-	0.19	-	-	-	✗
2026 Safenlp 2024	27	UNSAT	1.04	1.51	2.10	2.28	-	19.7	-	-	-	-	-	-	-
2026 Safenlp 2024	28	UNSAT	0.90	1.50	1.53	2.29	11.0	11.1	7.13	-	-	-	1.69	-	-
2026 Safenlp 2024	29	SAT	0.33	0.97	0.68	2.23	5.42	0.41	0.11	0.20	0.11	0.93	0.20	-	✗
2026 Safenlp 2024	30	UNSAT	1.01	1.45	1.53	2.29	10.9	2.05	6.59	-	-	-	1.07	-	-
2026 Safenlp 2024	31	UNSAT	1.06	1.55	2.10	2.38	11.0	4.10	9.83	-	-	-	3.94	-	-
2026 Safenlp 2024	32	SAT	0.64	0.97	0.67	0.44	5.22	0.41	0.10	0.15	0.13	0.88	0.26	-	✗
2026 Safenlp 2024	33	SAT	0.56	0.98	0.64	3.70	5.48	0.41	0.11	0.04	0.13	0.85	0.19	-	✗
2026 Safenlp 2024	34	SAT	0.64	0.97	0.63	1.93	4.91	0.41	0.11	0.23	0.12	0.87	0.23	-	✗
2026 Safenlp 2024	35	SAT	0.57	0.99	0.64	0.36	5.37	0.41	0.11	0.18	0.15	0.91	0.17	0.52	✗
2026 Safenlp 2024	36	UNSAT	0.91	1.45	1.22	2.20	11.1	1.85	4.22	-	-	-	1.41	-	18.4
2026 Safenlp 2024	37	UNSAT	1.39	1.96	-	3.36	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	38	SAT	0.63	0.97	0.62	0.09	5.48	0.41	0.11	0.17	0.12	0.95	0.20	0.48	✗
2026 Safenlp 2024	39	UNSAT	0.13	0.74	0.74	2.14	10.9	0.21	0.36	0.37	3.59	0.84	0.10	-	0.41
2026 Safenlp 2024	40	SAT	0.59	0.97	0.63	2.34	5.58	0.42	0.09	0.16	0.14	0.88	0.19	-	✗
2026 Safenlp 2024	41	SAT	0.62	0.98	0.62	0.12	5.39	0.41	0.11	0.17	0.11	0.84	0.20	0.47	✗
2026 Safenlp 2024	42	SAT	0.65	0.99	0.63	2.22	5.57	0.41	0.09	0.04	0.12	0.85	0.21	-	✗
2026 Safenlp 2024	43	UNSAT	0.85	1.46	1.61	2.28	11.0	0.82	11.6	-	-	-	0.46	-	12.4
2026 Safenlp 2024	44	SAT	0.58	1.00	0.66	0.06	4.21	0.41	0.11	0.20	0.11	0.85	0.22	0.51	✗
2026 Safenlp 2024	45	SAT	0.63	0.99	0.69	3.73	6.18	0.41	0.12	0.25	0.13	0.91	✗	-	✗
2026 Safenlp 2024	46	UNSAT	0.98	1.51	1.60	2.23	11.0	5.94	6.77	-	-	-	6.16	-	-
2026 Safenlp 2024	47	SAT	0.63	0.98	0.61	3.67	5.49	0.41	0.11	0.18	0.13	0.85	0.18	-	✗
2026 Safenlp 2024	48	SAT	0.63	0.99	0.57	3.72	-	2.26	0.12	-	0.15	-	0.39	-	✗
2026 Safenlp 2024	49	SAT	0.52	0.99	0.63	2.18	5.53	0.41	0.10	0.03	0.13	0.92	0.17	-	✗
2026 Safenlp 2024	50	SAT	0.45	1.01	0.62	2.63	5.75	-	0.11	0.25	0.11	-	-	-	✗
2026 Safenlp 2024	51	SAT	0.54	1.01	0.64	✗	5.02	0.41	0.09	0.18	0.12	0.87	0.22	-	✗
2026 Safenlp 2024	52	SAT	0.49	1.00	0.59	✗	5.75	1.03	0.09	0.03	0.13	1.11	0.20	-	✗
2026 Safenlp 2024	53	SAT	0.49	0.99	0.70	0.08	4.28	0.42	0.10	0.05	0.13	0.83	0.17	0.50	✗
2026 Safenlp 2024	54	SAT	0.65	0.98	0.63	2.18	5.57	0.41	0.11	0.04	0.15	0.82	0.16	-	✗
2026 Safenlp 2024	55	SAT	0.64	0.99	0.63	0.53	5.40	0.41	0.09	0.21	0.10	0.87	0.18	0.52	✗
2026 Safenlp 2024	56	UNSAT	1.46	1.91	3.02	2.61	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	57	SAT	0.62	0.99	0.66	✗	5.55	0.41	0.11	0.04	0.11	0.84	0.20	-	✗
2026 Safenlp 2024	58	SAT	0.57	0.99	0.64	0.02	4.23	0.41	0.11	0.18	0.11	0.86	0.16	0.37	✗
2026 Safenlp 2024	59	SAT	0.57	0.99	0.66	3.71	5.67	0.41	0.09	0.19	0.13	0.83	0.20	-	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	60	UNSAT	1.04	1.52	2.50	2.37	-	-	12.9	-	-	-	19.6	-	-
2026 Safenlp 2024	61	SAT	0.62	0.99	0.61	2.21	5.66	0.41	0.09	0.18	0.11	0.87	0.18	-	✗
2026 Safenlp 2024	62	SAT	0.47	0.98	0.62	3.64	-	-	0.11	-	0.13	-	-	-	✗
2026 Safenlp 2024	63	UNSAT	0.13	0.75	0.81	2.18	11.0	0.21	0.36	0.26	3.61	0.91	0.10	-	0.42
2026 Safenlp 2024	64	SAT	0.63	1.00	0.65	2.59	6.12	0.41	0.10	0.22	0.15	0.89	✗	-	✗
2026 Safenlp 2024	65	UNSAT	0.14	0.75	0.84	2.15	10.9	0.82	0.35	0.26	3.53	-	0.15	-	0.07
2026 Safenlp 2024	66	SAT	0.43	0.99	0.62	✗	5.54	1.23	0.09	0.05	0.16	1.05	0.22	-	✗
2026 Safenlp 2024	67	UNSAT	0.15	0.75	0.73	2.14	10.9	0.21	0.33	0.41	3.56	0.84	0.12	-	-
2026 Safenlp 2024	68	UNSAT	0.15	0.75	0.79	2.17	10.9	0.82	0.35	0.43	3.56	-	0.18	-	0.47
2026 Safenlp 2024	69	SAT	0.65	0.99	0.63	3.72	5.63	0.41	0.09	0.21	0.14	0.84	0.23	-	✗
2026 Safenlp 2024	70	UNSAT	0.15	0.76	0.72	2.13	10.9	0.21	0.35	0.25	3.60	0.92	0.14	-	0.43
2026 Safenlp 2024	71	SAT	0.53	0.99	0.63	0.11	4.30	0.41	0.11	0.20	0.17	0.83	0.20	0.62	✗
2026 Safenlp 2024	72	UNSAT	1.14	1.50	1.71	2.23	11.0	2.87	9.92	-	-	-	4.01	-	-
2026 Safenlp 2024	73	UNSAT	1.20	1.56	3.30	2.48	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	74	SAT	0.65	0.95	0.63	✗	5.58	0.41	0.10	0.20	0.13	0.89	0.17	-	✗
2026 Safenlp 2024	75	UNSAT	0.98	1.50	1.38	2.22	11.0	2.26	6.98	-	-	-	0.73	-	-
2026 Safenlp 2024	76	SAT	0.49	0.99	0.62	0.49	4.95	0.41	0.12	0.03	0.16	0.86	0.20	-	✗
2026 Safenlp 2024	77	UNSAT	0.13	0.74	0.75	2.12	10.9	0.21	0.36	0.25	3.56	0.92	0.12	-	-
2026 Safenlp 2024	78	UNSAT	0.89	1.47	1.37	2.20	11.0	2.05	5.44	-	-	-	0.60	-	11.5
2026 Safenlp 2024	79	UNSAT	1.87	2.17	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	80	SAT	0.62	0.99	0.59	0.46	5.17	0.41	0.09	0.01	0.87	0.86	0.22	0.54	✗
2026 Safenlp 2024	81	SAT	0.61	0.99	0.62	✗	5.41	0.41	0.11	0.23	0.37	0.97	0.22	-	✗
2026 Safenlp 2024	82	SAT	0.49	0.99	0.62	0.02	5.33	0.41	0.10	0.04	0.13	0.88	0.21	0.52	✗
2026 Safenlp 2024	83	SAT	0.35	0.99	0.63	0.03	4.22	0.41	0.12	0.04	0.16	0.88	0.18	0.50	✗
2026 Safenlp 2024	84	SAT	0.52	0.99	0.63	0.02	4.99	0.41	0.09	0.19	0.12	0.86	0.17	0.62	✗
2026 Safenlp 2024	85	UNSAT	0.96	1.53	2.63	2.31	-	6.97	15.6	-	-	-	12.9	-	-
2026 Safenlp 2024	86	UNSAT	1.22	1.52	3.68	2.35	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	87	UNSAT	1.06	1.50	3.18	2.55	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	88	UNSAT	0.14	0.77	0.73	2.12	10.8	0.21	0.34	0.38	3.57	0.86	0.14	-	-
2026 Safenlp 2024	89	SAT	0.59	0.98	0.64	0.09	5.12	0.41	0.11	0.18	0.11	0.90	0.17	0.47	✗
2026 Safenlp 2024	90	UNSAT	1.21	1.52	2.65	2.31	-	4.10	-	-	-	-	12.9	-	-
2026 Safenlp 2024	91	UNSAT	0.13	0.74	0.78	2.15	11.0	0.21	0.35	0.40	3.52	0.85	0.12	-	0.13
2026 Safenlp 2024	92	UNSAT	1.86	2.03	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	93	UNSAT	1.29	1.63	6.03	2.39	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	94	SAT	0.43	0.99	0.61	0.02	4.23	0.41	0.10	0.17	0.13	0.88	✗	0.45	✗
2026 Safenlp 2024	95	UNSAT	1.07	1.62	5.15	2.40	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	96	SAT	0.63	1.01	0.60	2.16	5.40	0.41	0.11	0.02	0.13	0.89	0.17	-	✗
2026 Safenlp 2024	97	SAT	0.55	0.99	0.61	0.03	5.20	0.41	0.11	0.04	0.31	0.82	0.18	0.58	✗
2026 Safenlp 2024	98	SAT	0.30	0.98	0.64	0.04	4.21	0.41	0.11	0.19	0.78	0.86	0.16	0.37	✗
2026 Safenlp 2024	99	SAT	0.59	1.00	0.65	0.14	5.49	0.41	0.11	0.21	0.79	0.88	0.22	0.46	✗
2026 Safenlp 2024	100	SAT	0.63	1.00	0.64	2.26	5.61	-	0.11	0.25	0.79	-	0.80	-	✗
2026 Safenlp 2024	101	SAT	0.60	0.99	0.62	0.02	4.17	0.41	0.12	0.04	0.81	0.90	0.16	0.38	✗
2026 Safenlp 2024	102	SAT	0.36	1.00	0.67	2.17	5.46	0.41	0.11	0.22	0.84	0.84	0.19	-	✗
2026 Safenlp 2024	103	SAT	0.62	0.99	0.65	0.34	4.95	0.41	0.09	0.19	0.85	0.85	0.17	0.18	✗
2026 Safenlp 2024	104	SAT	0.37	0.99	0.65	0.02	5.40	0.42	0.12	0.16	0.30	0.89	0.17	0.39	✗
2026 Safenlp 2024	105	SAT	0.39	0.99	0.61	0.03	4.24	0.41	0.12	0.20	0.13	0.89	0.11	0.39	✗
2026 Safenlp 2024	106	SAT	0.64	1.01	0.62	0.11	5.34	0.41	0.11	0.19	0.11	0.82	0.20	0.43	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	107	SAT	0.65	1.00	0.63	0.12	5.46	0.41	0.12	0.20	0.12	0.92	0.20	-	✗
2026 Safenlp 2024	108	UNSAT	1.20	1.67	-	6.24	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	109	SAT	0.65	1.00	0.63	1.81	5.76	0.41	0.09	0.03	0.12	0.89	0.17	-	✗
2026 Safenlp 2024	110	UNSAT	0.14	0.77	0.76	2.15	10.9	0.21	0.34	0.44	3.52	0.83	0.13	-	0.43
2026 Safenlp 2024	111	SAT	0.63	0.99	0.64	3.66	5.44	0.41	0.11	0.21	0.13	0.84	0.17	-	✗
2026 Safenlp 2024	112	UNSAT	0.14	0.76	0.76	2.24	10.9	0.21	0.33	0.27	3.56	0.86	0.10	-	0.41
2026 Safenlp 2024	113	UNSAT	0.13	0.76	0.72	2.21	10.9	0.21	0.35	0.26	3.56	0.83	0.11	-	0.11
2026 Safenlp 2024	114	SAT	0.64	1.00	0.61	2.23	5.43	1.23	0.11	0.26	0.15	-	0.17	-	✗
2026 Safenlp 2024	115	UNSAT	1.04	1.62	4.91	2.49	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	116	UNSAT	6.29	7.77	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	117	SAT	0.64	1.01	0.68	2.21	5.54	0.41	0.09	0.04	0.12	0.90	0.17	-	✗
2026 Safenlp 2024	118	SAT	0.49	0.99	0.66	3.96	6.78	8.82	0.10	0.28	0.14	-	-	-	✗
2026 Safenlp 2024	119	UNSAT	0.13	0.75	0.73	2.23	11.0	0.21	0.36	0.25	3.56	0.88	0.09	-	0.41
2026 Safenlp 2024	120	UNSAT	0.92	1.57	4.04	2.42	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	121	SAT	0.65	0.99	0.63	✗	5.41	0.41	0.11	0.20	0.15	0.86	0.20	-	✗
2026 Safenlp 2024	122	UNSAT	0.14	0.75	0.77	2.12	10.9	0.21	0.34	0.41	3.56	0.94	0.14	-	0.42
2026 Safenlp 2024	123	UNSAT	0.84	1.45	1.14	2.21	11.0	1.44	7.68	-	-	-	0.73	-	-
2026 Safenlp 2024	124	UNSAT	0.14	0.76	0.84	2.23	10.9	0.21	0.35	0.36	3.57	0.94	0.17	-	0.09
2026 Safenlp 2024	125	SAT	0.60	0.98	0.64	0.01	4.19	0.41	0.12	0.19	0.12	0.85	0.23	0.48	✗
2026 Safenlp 2024	126	UNSAT	0.14	0.74	0.77	2.16	10.9	0.21	0.34	0.40	3.56	0.89	0.13	-	-
2026 Safenlp 2024	127	SAT	0.63	0.99	0.64	0.39	5.46	0.41	0.10	0.18	0.11	0.91	0.18	-	✗
2026 Safenlp 2024	128	UNSAT	1.04	1.54	5.81	2.44	-	-	-	-	-	-	15.3	-	-
2026 Safenlp 2024	129	SAT	0.30	0.99	0.63	0.03	4.17	0.41	0.12	0.19	0.19	0.87	0.20	0.37	✗
2026 Safenlp 2024	130	SAT	0.61	0.99	0.67	2.16	5.51	1.03	0.12	0.20	0.12	0.99	0.18	-	✗
2026 Safenlp 2024	131	SAT	0.32	0.97	0.66	2.24	5.48	0.41	0.09	0.27	0.12	0.82	0.19	-	✗
2026 Safenlp 2024	132	SAT	0.65	0.97	0.59	0.34	5.35	0.41	0.12	0.03	0.14	0.86	0.21	-	✗
2026 Safenlp 2024	133	UNSAT	0.92	1.46	1.38	2.29	11.0	1.85	6.13	-	-	-	1.16	-	-
2026 Safenlp 2024	134	SAT	0.64	0.99	0.61	2.37	5.44	0.41	0.11	0.21	0.12	0.85	0.20	-	✗
2026 Safenlp 2024	135	SAT	0.58	0.98	0.65	0.03	4.28	0.41	0.10	0.17	0.12	0.86	0.22	0.42	✗
2026 Safenlp 2024	136	SAT	0.43	0.99	0.65	2.80	7.80	2.05	0.11	0.26	0.17	-	0.41	-	✗
2026 Safenlp 2024	137	SAT	0.52	0.99	0.62	2.32	5.65	0.41	0.11	0.19	0.12	0.87	0.20	-	✗
2026 Safenlp 2024	138	SAT	0.43	0.99	0.63	2.16	5.63	0.41	0.11	0.09	0.12	0.94	0.21	-	✗
2026 Safenlp 2024	139	SAT	0.61	1.00	0.63	✗	5.61	0.41	0.11	0.24	0.14	0.90	0.17	-	✗
2026 Safenlp 2024	140	SAT	0.65	1.00	0.63	1.45	5.55	0.41	0.11	0.19	0.12	0.87	0.20	-	✗
2026 Safenlp 2024	141	SAT	0.50	0.99	0.67	0.03	4.23	0.41	0.12	<0.01	0.14	0.89	0.19	0.34	✗
2026 Safenlp 2024	142	UNSAT	0.92	1.45	0.92	2.17	10.9	0.82	2.25	-	-	-	0.21	-	5.79
2026 Safenlp 2024	143	SAT	0.64	0.99	0.66	3.69	5.66	1.03	0.09	0.26	0.14	0.88	0.17	-	✗
2026 Safenlp 2024	144	SAT	0.64	1.00	0.66	2.31	5.65	0.41	0.11	0.05	0.11	0.83	0.19	-	✗
2026 Safenlp 2024	145	UNSAT	1.39	1.62	4.03	2.47	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	146	SAT	0.60	0.99	0.63	0.05	4.23	0.41	0.09	<0.01	0.11	0.85	0.17	0.42	✗
2026 Safenlp 2024	147	SAT	0.41	1.00	0.59	0.78	5.37	0.41	0.11	0.20	0.19	0.83	0.20	-	✗
2026 Safenlp 2024	148	SAT	0.63	1.00	0.60	3.78	5.37	0.41	0.11	0.20	0.13	0.92	0.18	-	✗
2026 Safenlp 2024	149	SAT	0.58	0.99	0.68	2.27	4.26	0.41	0.11	0.19	0.12	0.87	0.19	-	✗
2026 Safenlp 2024	150	UNSAT	1.15	1.56	2.65	2.40	11.1	4.92	14.8	-	-	-	17.8	-	-
2026 Safenlp 2024	151	SAT	0.60	1.00	0.62	0.01	4.22	0.41	0.10	0.18	0.11	0.89	0.19	0.44	✗
2026 Safenlp 2024	152	UNSAT	1.11	1.56	2.35	2.43	-	-	11.5	-	-	-	-	-	-
2026 Safenlp 2024	153	SAT	0.64	0.98	0.63	✗	5.44	0.41	0.12	0.20	0.15	0.87	0.19	-	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	154	SAT	0.61	1.00	0.63	0.07	5.40	0.41	0.11	0.02	0.11	0.89	0.22	0.50	✗
2026 Safenlp 2024	155	UNSAT	0.13	0.74	0.78	2.26	10.9	0.21	0.35	0.47	3.53	0.90	0.13	-	0.09
2026 Safenlp 2024	156	SAT	0.66	0.98	0.62	✗	5.32	0.41	0.10	0.17	0.10	0.87	0.17	-	✗
2026 Safenlp 2024	157	UNSAT	0.13	0.74	0.75	2.22	11.0	0.21	0.35	0.44	3.56	0.87	0.12	-	0.41
2026 Safenlp 2024	158	UNSAT	1.18	1.51	2.12	2.23	11.1	5.94	12.0	-	-	-	8.63	-	-
2026 Safenlp 2024	159	SAT	0.58	1.00	0.59	0.03	4.18	0.41	0.10	0.19	0.11	0.91	0.20	0.54	✗
2026 Safenlp 2024	160	UNSAT	1.02	1.56	2.56	2.43	-	-	15.4	-	-	-	-	-	-
2026 Safenlp 2024	161	SAT	0.38	0.99	0.66	2.27	6.09	0.41	0.12	0.23	0.13	0.92	0.21	-	✗
2026 Safenlp 2024	162	UNSAT	0.14	0.75	0.79	2.22	10.9	0.21	0.36	0.41	3.54	0.85	0.13	-	0.47
2026 Safenlp 2024	163	SAT	0.47	0.98	0.65	3.69	5.64	0.41	0.11	0.06	0.13	0.90	0.23	-	✗
2026 Safenlp 2024	164	SAT	0.48	1.00	0.65	<0.01	4.20	0.41	0.12	0.23	0.17	0.88	0.14	0.46	✗
2026 Safenlp 2024	165	SAT	0.66	0.98	0.63	✗	6.14	0.41	0.11	0.08	0.12	0.86	✗	-	✗
2026 Safenlp 2024	166	UNSAT	8.23	10.8	19.2	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	167	UNSAT	1.26	1.88	8.70	2.52	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	168	UNSAT	0.18	1.43	0.80	2.19	11.0	0.82	0.60	0.32	3.86	-	0.14	-	0.06
2026 Safenlp 2024	169	UNSAT	0.90	1.47	1.36	2.34	11.1	2.46	6.59	-	-	-	3.52	-	-
2026 Safenlp 2024	170	SAT	0.57	1.00	0.65	✗	5.36	0.41	0.11	0.11	0.12	0.86	✗	-	✗
2026 Safenlp 2024	171	UNSAT	1.13	1.57	2.79	2.56	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	172	SAT	0.67	1.00	0.60	3.73	5.70	2.05	0.09	0.17	0.14	-	0.43	-	✗
2026 Safenlp 2024	173	SAT	0.58	1.00	0.60	0.04	4.21	0.41	0.12	0.04	0.12	0.87	0.20	0.65	✗
2026 Safenlp 2024	174	UNSAT	0.13	0.76	0.80	2.13	11.0	0.82	0.36	0.46	3.57	-	0.16	-	0.09
2026 Safenlp 2024	175	SAT	0.64	0.98	0.67	3.72	5.52	0.41	0.12	0.25	0.15	0.84	0.19	-	✗
2026 Safenlp 2024	176	SAT	0.59	0.99	0.67	0.27	4.28	0.41	0.09	0.23	0.12	0.84	0.18	0.50	✗
2026 Safenlp 2024	177	SAT	0.62	1.00	0.65	2.20	5.43	0.41	0.11	0.08	0.14	0.85	0.18	-	✗
2026 Safenlp 2024	178	SAT	0.51	0.98	0.60	3.64	5.50	0.41	0.12	0.08	0.11	0.86	0.15	-	✗
2026 Safenlp 2024	179	UNSAT	0.89	1.45	1.51	2.25	11.0	2.26	8.96	-	-	-	1.69	-	-
2026 Safenlp 2024	180	UNSAT	0.94	1.47	0.88	2.20	11.0	0.82	3.60	-	-	-	0.20	-	5.69
2026 Safenlp 2024	181	SAT	0.35	1.00	0.67	2.27	6.76	0.41	0.12	0.30	0.14	0.92	0.16	-	✗
2026 Safenlp 2024	182	SAT	0.34	0.98	0.67	3.69	5.36	0.41	0.12	0.22	0.13	0.87	✗	-	✗
2026 Safenlp 2024	183	SAT	0.62	1.01	0.66	0.03	5.50	0.41	0.10	0.05	0.14	0.87	0.17	0.49	✗
2026 Safenlp 2024	184	SAT	0.45	1.02	0.69	✗	6.03	0.41	0.11	0.10	0.12	0.89	0.18	-	✗
2026 Safenlp 2024	185	UNSAT	0.16	0.75	0.81	2.30	11.0	0.21	0.35	0.46	3.54	0.88	0.11	-	-
2026 Safenlp 2024	186	SAT	0.63	1.00	0.63	✗	5.34	0.41	0.11	0.26	0.12	0.88	0.21	-	✗
2026 Safenlp 2024	187	SAT	0.34	1.02	0.65	0.22	5.34	0.42	0.11	0.05	0.13	0.90	0.22	0.38	✗
2026 Safenlp 2024	188	UNSAT	0.14	0.76	0.75	2.23	11.0	0.21	0.35	0.34	3.54	0.85	0.15	-	-
2026 Safenlp 2024	189	SAT	0.50	1.02	0.64	2.21	5.36	0.41	0.12	0.07	0.14	0.83	0.19	-	✗
2026 Safenlp 2024	190	SAT	0.67	1.01	0.65	3.67	5.61	0.41	0.10	0.08	0.13	0.89	0.17	-	✗
2026 Safenlp 2024	191	UNSAT	1.60	2.24	-	6.21	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	192	SAT	0.65	1.00	0.63	✗	5.62	0.41	0.11	0.24	0.11	0.86	✗	-	✗
2026 Safenlp 2024	193	SAT	0.67	1.00	0.64	2.20	5.46	0.41	0.11	0.08	0.13	0.88	✗	-	✗
2026 Safenlp 2024	194	UNSAT	0.14	0.76	0.76	2.16	10.9	0.21	0.35	0.47	3.52	0.86	0.12	-	0.05
2026 Safenlp 2024	195	SAT	0.46	0.99	0.62	3.66	5.57	0.41	0.09	0.07	0.18	0.84	0.18	-	✗
2026 Safenlp 2024	196	SAT	0.58	1.01	0.64	2.18	5.57	0.41	0.10	0.22	0.12	0.88	0.14	-	✗
2026 Safenlp 2024	197	SAT	0.50	0.99	0.66	0.05	4.18	0.41	0.11	0.10	0.13	0.85	0.20	0.58	✗
2026 Safenlp 2024	198	SAT	0.64	1.00	0.64	3.66	5.42	0.41	0.10	0.29	0.11	0.88	0.15	-	✗
2026 Safenlp 2024	199	SAT	0.44	1.01	0.62	1.85	4.93	0.41	0.11	0.05	0.11	0.87	0.20	-	✗
2026 Safenlp 2024	200	SAT	0.65	0.99	0.64	3.72	5.46	0.42	0.11	0.09	0.14	0.83	0.19	-	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	201	SAT	0.29	1.00	0.62	0.05	4.27	0.41	0.11	0.27	0.10	0.87	0.20	0.47	✗
2026 Safenlp 2024	202	UNSAT	0.13	0.76	0.78	2.21	10.9	0.21	0.34	0.30	3.54	0.84	0.13	-	0.06
2026 Safenlp 2024	203	SAT	0.37	1.00	0.64	3.69	5.49	0.41	0.12	0.08	0.12	0.85	0.17	-	✗
2026 Safenlp 2024	204	UNSAT	0.12	0.76	0.76	2.23	10.9	0.21	0.34	0.30	3.56	0.90	0.13	-	0.44
2026 Safenlp 2024	205	UNSAT	1.06	1.58	3.06	2.60	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	206	SAT	0.60	1.00	0.60	0.05	4.23	0.41	0.10	0.05	0.12	0.86	0.18	0.74	✗
2026 Safenlp 2024	207	SAT	0.59	1.02	0.66	4.03	-	19.5	0.10	0.33	0.20	-	-	-	✗
2026 Safenlp 2024	208	UNSAT	0.95	1.49	1.07	2.30	11.0	2.05	3.59	-	-	-	0.32	-	13.4
2026 Safenlp 2024	209	UNSAT	0.96	1.52	3.54	2.56	-	-	-	-	-	-	15.1	-	-
2026 Safenlp 2024	210	UNSAT	0.86	1.53	2.75	2.29	-	8.41	-	-	-	-	-	-	-
2026 Safenlp 2024	211	SAT	0.62	1.02	0.67	0.02	4.24	0.41	0.10	0.02	0.11	0.85	0.17	0.39	✗
2026 Safenlp 2024	212	SAT	0.48	1.00	0.61	3.68	5.42	0.41	0.10	0.24	0.12	0.85	0.18	-	✗
2026 Safenlp 2024	213	SAT	0.48	1.01	0.68	3.68	5.43	0.41	0.09	0.09	0.13	0.83	0.18	-	✗
2026 Safenlp 2024	214	SAT	0.62	1.00	0.65	0.63	5.37	0.42	0.10	0.07	0.11	0.84	0.20	-	✗
2026 Safenlp 2024	215	UNSAT	1.28	1.62	6.06	2.80	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	216	SAT	0.54	1.00	0.61	✗	5.38	0.41	0.11	0.08	0.12	0.85	✗	-	✗
2026 Safenlp 2024	217	UNSAT	1.66	1.87	-	2.99	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	218	UNSAT	0.15	0.76	0.78	2.23	10.9	0.21	0.35	0.33	3.52	0.89	0.17	-	-
2026 Safenlp 2024	219	SAT	0.58	1.00	0.63	0.03	4.23	0.41	0.09	0.05	0.10	0.81	0.16	0.48	✗
2026 Safenlp 2024	220	SAT	0.63	1.01	0.64	✗	5.76	1.03	0.11	0.12	0.19	-	0.35	-	✗
2026 Safenlp 2024	221	SAT	0.64	1.00	0.60	2.21	5.47	0.41	0.11	0.10	0.12	0.91	0.25	-	✗
2026 Safenlp 2024	222	SAT	0.65	1.01	0.62	2.16	5.51	0.41	0.10	0.24	0.13	0.85	0.24	-	✗
2026 Safenlp 2024	223	SAT	0.61	1.00	0.64	0.26	5.34	0.41	0.11	0.09	0.13	0.82	0.23	0.52	✗
2026 Safenlp 2024	224	SAT	0.58	0.99	0.66	0.03	4.30	0.41	0.12	0.07	0.13	0.87	✗	0.44	✗
2026 Safenlp 2024	225	UNSAT	0.83	1.47	1.06	2.18	11.0	0.82	3.05	-	-	-	0.27	-	6.26
2026 Safenlp 2024	226	UNSAT	0.15	0.77	0.74	2.16	11.1	0.21	0.34	0.32	3.61	0.96	0.18	-	0.07
2026 Safenlp 2024	227	UNSAT	1.09	1.50	1.94	2.21	11.1	-	7.89	-	-	-	11.1	-	-
2026 Safenlp 2024	228	UNSAT	0.14	0.76	0.74	2.11	11.0	0.21	0.36	0.31	3.55	0.86	0.13	-	0.40
2026 Safenlp 2024	229	UNSAT	1.16	1.48	1.14	2.28	11.1	1.85	4.82	-	-	-	1.57	-	-
2026 Safenlp 2024	230	UNSAT	1.16	1.47	0.93	2.27	11.0	0.82	4.24	-	-	-	0.28	-	11.2
2026 Safenlp 2024	231	SAT	0.66	1.02	0.63	3.67	5.46	0.41	0.12	0.08	0.11	0.84	0.24	-	✗
2026 Safenlp 2024	232	UNSAT	1.27	1.70	2.65	2.51	-	-	13.4	-	-	-	18.0	-	-
2026 Safenlp 2024	233	SAT	0.61	0.98	0.66	3.72	5.51	0.41	0.11	0.08	0.11	0.89	0.16	-	✗
2026 Safenlp 2024	234	SAT	0.38	0.97	0.62	✗	5.41	0.41	0.10	0.07	0.13	0.83	0.17	-	✗
2026 Safenlp 2024	235	UNSAT	0.88	1.50	1.38	2.23	11.1	2.87	9.78	-	-	-	3.70	-	-
2026 Safenlp 2024	236	UNSAT	0.83	1.44	1.94	2.19	11.1	7.99	9.45	-	-	-	1.57	-	-
2026 Safenlp 2024	237	UNSAT	2.10	2.30	9.95	3.20	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	238	SAT	0.45	1.03	0.63	0.03	4.25	0.41	0.10	0.07	0.12	0.82	0.18	0.55	✗
2026 Safenlp 2024	239	SAT	0.26	1.01	0.63	0.01	4.24	0.41	0.12	0.10	0.12	0.91	0.13	0.46	✗
2026 Safenlp 2024	240	UNSAT	0.14	0.77	0.80	2.12	10.9	0.21	0.35	0.32	3.56	0.92	0.12	-	0.07
2026 Safenlp 2024	241	UNSAT	0.90	1.47	1.29	2.22	11.1	2.26	5.86	-	-	-	1.51	-	-
2026 Safenlp 2024	242	UNSAT	0.13	0.75	0.77	2.24	10.9	0.21	0.34	0.30	3.54	0.85	0.11	-	-
2026 Safenlp 2024	243	SAT	0.46	1.00	0.62	0.02	4.24	0.41	0.12	0.09	0.10	0.83	✗	0.43	✗
2026 Safenlp 2024	244	UNSAT	0.14	0.75	0.75	2.24	11.0	0.21	0.35	0.47	3.53	0.83	0.17	-	0.06
2026 Safenlp 2024	245	UNSAT	0.14	0.75	0.80	2.14	10.9	0.82	0.35	0.33	3.52	-	0.22	-	0.08
2026 Safenlp 2024	246	SAT	0.64	1.00	0.64	1.02	5.48	0.41	0.12	0.06	0.14	0.89	0.24	0.63	✗
2026 Safenlp 2024	247	UNSAT	1.09	1.52	2.86	2.38	-	-	13.4	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	248	UNSAT	0.13	0.77	0.79	2.12	11.0	0.21	0.35	0.48	3.53	0.87	0.12	-	0.44
2026 Safenlp 2024	249	SAT	0.59	1.01	0.63	1.99	5.48	0.41	0.10	0.08	0.16	0.96	0.19	-	✗
2026 Safenlp 2024	250	SAT	0.54	1.01	0.66	2.30	6.56	1.23	0.10	0.24	0.14	0.92	0.19	-	✗
2026 Safenlp 2024	251	UNSAT	0.91	1.50	1.04	2.19	11.0	1.03	3.01	-	-	-	0.22	-	6.32
2026 Safenlp 2024	252	UNSAT	0.14	0.74	0.78	2.11	10.9	0.21	0.33	0.32	3.54	0.86	0.11	-	0.40
2026 Safenlp 2024	253	SAT	0.52	0.99	0.63	0.38	5.47	0.41	0.10	0.09	0.12	0.92	0.21	-	✗
2026 Safenlp 2024	254	UNSAT	0.13	0.76	0.76	2.14	11.0	0.21	0.37	0.30	3.54	0.83	0.13	-	0.05
2026 Safenlp 2024	255	UNSAT	1.58	1.87	-	3.45	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	256	SAT	0.63	1.00	0.64	✗	5.46	0.41	0.10	0.09	0.13	0.91	0.17	-	✗
2026 Safenlp 2024	257	SAT	0.43	1.00	0.63	0.38	4.25	0.41	0.11	0.07	0.12	0.84	0.18	0.31	✗
2026 Safenlp 2024	258	SAT	0.59	0.99	0.60	0.04	4.25	0.41	0.10	0.12	0.16	0.90	0.18	0.43	✗
2026 Safenlp 2024	259	SAT	0.68	1.02	0.61	✗	5.81	1.23	0.12	0.08	0.13	-	0.17	-	✗
2026 Safenlp 2024	260	SAT	0.60	0.99	0.63	0.03	4.98	0.41	0.11	0.07	0.74	0.84	0.17	0.52	✗
2026 Safenlp 2024	261	UNSAT	1.37	1.91	5.11	2.59	-	-	-	-	-	-	17.6	-	-
2026 Safenlp 2024	262	SAT	0.34	1.01	0.62	0.10	4.26	0.41	0.12	0.06	0.87	0.96	0.19	0.51	✗
2026 Safenlp 2024	263	UNSAT	0.15	0.76	0.77	2.21	10.9	0.21	0.34	0.29	3.94	0.86	0.10	-	0.40
2026 Safenlp 2024	264	SAT	0.64	0.99	0.61	3.65	5.58	0.41	0.11	0.23	0.13	0.87	0.19	-	✗
2026 Safenlp 2024	265	UNSAT	1.31	1.59	4.57	2.36	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	266	UNSAT	0.14	0.75	0.77	2.12	10.9	0.21	0.36	0.47	3.52	0.85	0.12	-	0.41
2026 Safenlp 2024	267	SAT	0.61	0.99	0.60	0.05	4.27	0.41	0.12	0.07	0.13	0.87	0.20	0.53	✗
2026 Safenlp 2024	268	SAT	0.61	1.00	0.64	<0.01	4.27	0.41	0.10	0.07	0.11	0.84	0.18	0.53	✗
2026 Safenlp 2024	269	SAT	0.48	0.99	0.65	0.02	4.26	0.41	0.09	0.10	0.11	0.84	0.25	0.47	✗
2026 Safenlp 2024	270	UNSAT	0.14	0.73	0.77	2.24	10.9	0.21	0.35	0.47	3.53	0.85	0.17	-	0.08
2026 Safenlp 2024	271	SAT	0.64	0.98	0.60	✗	5.45	0.41	0.11	0.06	0.17	0.87	0.21	-	✗
2026 Safenlp 2024	272	SAT	0.65	0.98	0.64	3.71	5.46	1.23	0.11	0.30	0.12	0.95	0.29	-	✗
2026 Safenlp 2024	273	SAT	0.62	1.00	0.62	0.04	5.49	0.41	0.11	0.09	0.11	0.84	0.21	0.54	✗
2026 Safenlp 2024	274	UNSAT	0.92	1.52	3.45	2.47	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	275	SAT	0.60	0.99	0.59	0.11	4.32	0.41	0.11	0.06	0.10	0.89	0.19	0.44	✗
2026 Safenlp 2024	276	SAT	0.66	0.98	0.61	3.66	5.62	0.41	0.12	0.09	0.14	0.84	0.18	-	✗
2026 Safenlp 2024	277	UNSAT	0.16	0.74	0.74	2.16	10.9	0.21	0.34	0.31	3.56	0.87	0.12	-	0.10
2026 Safenlp 2024	278	SAT	0.62	1.00	0.65	0.92	5.22	0.41	0.11	0.07	0.11	0.89	0.23	-	✗
2026 Safenlp 2024	279	UNSAT	1.75	2.13	-	4.52	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	280	UNSAT	1.50	1.89	3.81	2.64	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	281	SAT	0.46	0.99	0.63	0.10	4.95	0.41	0.11	0.12	0.12	0.89	0.17	0.53	✗
2026 Safenlp 2024	282	SAT	0.43	0.98	0.61	2.17	6.13	0.41	0.11	0.08	0.12	0.87	0.16	-	✗
2026 Safenlp 2024	283	UNSAT	1.69	1.95	4.88	3.27	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	284	UNSAT	0.14	0.75	0.83	2.15	10.9	0.21	0.35	0.48	3.54	0.90	0.11	-	0.05
2026 Safenlp 2024	285	UNSAT	0.14	0.73	0.83	2.10	10.9	0.82	0.34	0.48	3.56	-	0.13	-	0.05
2026 Safenlp 2024	286	SAT	0.57	0.98	0.66	3.73	6.07	1.23	0.10	0.05	0.13	1.09	0.19	-	✗
2026 Safenlp 2024	287	SAT	0.65	0.98	0.64	3.73	5.51	0.41	0.10	0.08	0.12	0.88	0.22	-	✗
2026 Safenlp 2024	288	UNSAT	1.01	1.49	1.55	2.25	11.0	6.15	6.66	-	-	-	2.08	-	-
2026 Safenlp 2024	289	UNSAT	1.17	1.50	2.45	2.48	-	7.79	-	-	-	-	-	-	-
2026 Safenlp 2024	290	SAT	0.55	0.97	0.62	2.28	5.55	0.41	0.11	0.12	0.12	0.86	0.19	-	✗
2026 Safenlp 2024	291	SAT	0.66	0.98	0.61	3.80	5.35	0.41	0.11	0.06	0.12	0.89	0.23	-	✗
2026 Safenlp 2024	292	SAT	0.42	1.00	0.61	0.70	5.57	0.41	0.09	0.22	0.12	0.86	0.16	0.46	✗
2026 Safenlp 2024	293	SAT	0.50	1.00	0.67	✗	5.50	0.41	0.11	0.09	0.12	0.85	0.16	-	✗
2026 Safenlp 2024	294	UNSAT	1.03	1.56	2.71	2.29	-	8.81	7.92	-	-	-	8.32	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	295	SAT	0.53	1.00	0.62	2.27	5.50	0.42	0.10	0.08	0.12	0.89	✗	-	✗
2026 Safenlp 2024	296	SAT	0.56	0.99	0.65	3.69	5.74	1.03	0.11	0.13	0.15	1.07	0.20	-	✗
2026 Safenlp 2024	297	SAT	0.41	1.00	0.60	0.05	5.33	0.41	0.11	0.07	0.11	0.85	✗	0.43	✗
2026 Safenlp 2024	298	SAT	0.59	0.99	0.62	3.77	5.62	1.64	0.11	0.19	0.15	-	0.49	-	✗
2026 Safenlp 2024	299	UNSAT	3.71	3.94	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	300	SAT	0.46	0.99	0.63	2.20	5.54	1.23	0.13	0.14	0.18	-	0.28	-	✗
2026 Safenlp 2024	301	UNSAT	0.14	0.76	0.75	2.15	10.9	0.21	0.34	0.31	3.52	0.87	0.13	-	0.08
2026 Safenlp 2024	302	UNSAT	0.16	0.75	0.75	2.15	11.2	0.21	0.35	0.29	3.57	0.93	0.12	-	-
2026 Safenlp 2024	303	SAT	0.49	0.97	0.63	0.74	5.40	0.41	0.09	0.08	0.10	0.85	0.18	-	✗
2026 Safenlp 2024	304	SAT	0.63	1.00	0.63	2.26	5.53	0.41	0.11	0.24	0.12	0.85	0.20	-	✗
2026 Safenlp 2024	305	UNSAT	0.88	1.46	0.93	2.18	11.0	1.85	2.97	-	-	-	0.29	-	8.82
2026 Safenlp 2024	306	UNSAT	5.77	3.60	12.6	8.41	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	307	UNSAT	3.34	3.77	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	308	SAT	0.65	0.98	0.65	0.03	5.39	0.41	0.11	0.10	0.11	0.90	0.22	0.69	✗
2026 Safenlp 2024	309	SAT	0.60	0.98	0.68	0.32	5.45	0.41	0.11	0.09	0.11	0.85	✗	0.08	✗
2026 Safenlp 2024	310	SAT	0.35	0.97	0.63	0.36	4.26	0.41	0.11	0.05	0.12	0.86	0.17	0.53	✗
2026 Safenlp 2024	311	SAT	0.54	0.97	0.60	0.18	5.13	0.41	0.10	0.09	0.14	0.90	✗	-	✗
2026 Safenlp 2024	312	SAT	0.61	0.98	0.65	0.03	5.48	0.41	0.13	0.10	0.12	0.92	✗	0.35	✗
2026 Safenlp 2024	313	SAT	0.29	0.98	0.62	0.02	4.27	0.41	0.10	0.07	0.12	0.86	0.17	0.63	✗
2026 Safenlp 2024	314	SAT	0.49	0.97	0.60	3.80	5.65	1.03	0.12	0.12	0.14	-	0.19	-	✗
2026 Safenlp 2024	315	UNSAT	1.03	1.57	4.77	2.48	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	316	SAT	0.66	0.99	0.66	2.31	5.49	0.41	0.09	0.06	0.12	0.85	0.20	-	✗
2026 Safenlp 2024	317	UNSAT	0.89	1.45	1.38	2.27	11.1	0.82	7.41	-	-	-	0.40	-	17.0
2026 Safenlp 2024	318	UNSAT	2.01	2.06	14.0	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	319	SAT	0.58	0.99	0.61	2.19	4.99	0.41	0.10	0.26	0.13	0.84	0.19	-	✗
2026 Safenlp 2024	320	UNSAT	0.15	0.76	0.76	2.16	11.0	0.21	0.36	0.30	3.63	0.92	0.13	-	0.05
2026 Safenlp 2024	321	SAT	0.60	0.98	0.63	0.01	4.26	0.41	0.10	0.07	0.11	0.87	0.17	0.48	✗
2026 Safenlp 2024	322	SAT	0.36	0.98	0.61	0.07	4.28	0.41	0.09	0.27	0.12	0.87	0.19	0.44	✗
2026 Safenlp 2024	323	SAT	0.38	0.96	0.64	4.00	6.22	1.03	0.11	0.24	0.16	0.94	0.69	-	✗
2026 Safenlp 2024	324	SAT	0.48	0.98	0.65	3.71	4.97	0.41	0.09	0.25	0.11	0.90	0.24	-	✗
2026 Safenlp 2024	325	SAT	0.65	0.99	0.66	3.65	5.49	1.64	0.09	0.09	0.19	-	0.17	-	✗
2026 Safenlp 2024	326	UNSAT	1.20	1.49	2.12	2.37	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	327	SAT	0.62	0.98	0.67	2.20	5.61	5.95	0.10	0.18	0.17	-	0.35	-	✗
2026 Safenlp 2024	328	SAT	0.34	0.96	0.63	3.67	4.98	0.41	0.09	0.07	0.14	0.90	0.15	-	✗
2026 Safenlp 2024	329	UNSAT	0.98	1.54	3.14	2.48	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	330	UNSAT	2.16	2.37	4.77	4.02	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	331	SAT	0.66	0.98	0.65	2.21	5.56	1.23	0.11	0.08	0.13	0.91	0.25	-	✗
2026 Safenlp 2024	332	SAT	0.53	0.98	0.65	1.01	4.29	0.41	0.10	0.08	0.11	0.82	0.20	-	✗
2026 Safenlp 2024	333	SAT	0.38	0.97	0.59	3.66	5.49	0.41	0.11	0.09	0.14	0.88	✗	-	✗
2026 Safenlp 2024	334	SAT	0.61	0.98	0.60	0.06	5.23	0.41	0.11	0.09	0.11	0.86	0.19	0.46	✗
2026 Safenlp 2024	335	SAT	0.59	0.97	0.60	0.10	4.23	0.41	0.10	0.06	0.12	0.85	0.18	0.49	✗
2026 Safenlp 2024	336	SAT	0.49	0.97	0.62	2.25	5.49	0.41	0.11	0.09	0.66	0.86	0.18	-	✗
2026 Safenlp 2024	337	UNSAT	0.14	0.73	0.78	2.13	10.9	0.21	0.35	0.28	4.28	0.88	0.14	-	-
2026 Safenlp 2024	338	SAT	0.67	0.98	0.64	3.27	-	-	-	-	1.21	-	-	-	-
2026 Safenlp 2024	339	UNSAT	0.15	0.73	0.79	2.24	11.0	0.21	0.36	0.30	4.32	0.87	0.12	-	-
2026 Safenlp 2024	340	UNSAT	2.43	2.30	3.28	3.03	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	341	SAT	0.41	0.98	0.61	0.12	5.35	0.41	0.12	0.06	0.76	0.92	0.10	0.52	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	342	UNSAT	1.29	1.58	2.55	2.28	-	-	10.8	-	-	-	10.8	-	-
2026 Safenlp 2024	343	SAT	0.66	0.99	0.63	3.79	5.66	0.41	0.12	0.09	0.19	0.88	0.19	-	✗
2026 Safenlp 2024	344	SAT	0.60	0.97	0.65	3.69	5.66	1.03	0.11	0.09	0.17	-	0.17	-	✗
2026 Safenlp 2024	345	SAT	0.60	0.98	0.62	0.08	5.40	0.41	0.11	0.07	0.12	0.89	0.22	0.59	✗
2026 Safenlp 2024	346	SAT	0.49	0.98	0.68	0.05	4.30	0.41	0.11	0.07	0.80	0.90	0.15	0.46	✗
2026 Safenlp 2024	347	SAT	0.54	0.98	0.62	0.15	4.29	0.41	0.12	0.08	0.86	0.85	0.17	0.41	✗
2026 Safenlp 2024	348	SAT	0.64	0.97	0.62	0.30	5.29	0.41	0.11	0.07	0.85	0.81	0.14	0.49	✗
2026 Safenlp 2024	349	SAT	0.41	0.99	0.65	3.65	5.56	0.41	0.12	0.27	0.91	0.92	0.16	-	✗
2026 Safenlp 2024	350	SAT	0.35	0.98	0.64	2.27	4.29	0.41	0.10	0.12	0.84	0.88	0.25	-	✗
2026 Safenlp 2024	351	SAT	0.55	0.98	0.65	2.27	5.77	0.41	0.11	0.07	0.87	0.90	0.19	-	✗
2026 Safenlp 2024	352	UNSAT	0.13	0.73	0.80	2.23	11.0	0.21	0.34	0.46	4.37	0.83	0.11	-	0.40
2026 Safenlp 2024	353	SAT	0.64	0.98	0.66	✗	6.21	1.23	0.11	0.10	1.00	-	0.17	-	✗
2026 Safenlp 2024	354	SAT	0.58	0.99	0.58	✗	6.03	0.41	0.09	0.07	0.72	0.89	0.20	-	✗
2026 Safenlp 2024	355	SAT	0.39	0.97	0.62	0.03	4.25	0.41	0.09	0.09	0.30	0.84	0.14	0.31	✗
2026 Safenlp 2024	356	UNSAT	0.12	0.75	0.77	2.15	11.0	0.21	0.35	0.30	3.56	0.86	0.13	-	0.06
2026 Safenlp 2024	357	UNSAT	1.72	2.02	4.64	2.72	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	358	UNSAT	0.13	0.73	0.80	2.23	10.9	0.82	0.34	0.32	3.55	-	0.21	-	0.44
2026 Safenlp 2024	359	SAT	0.63	0.99	0.62	0.13	5.01	0.41	0.12	0.08	0.15	0.84	0.22	-	✗
2026 Safenlp 2024	360	UNSAT	2.86	3.86	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	361	UNSAT	0.13	0.75	0.79	2.15	10.9	0.21	0.35	0.46	3.54	0.89	0.14	-	-
2026 Safenlp 2024	362	SAT	0.65	0.98	0.62	3.74	5.43	0.41	0.11	0.06	0.13	0.86	0.23	-	✗
2026 Safenlp 2024	363	UNSAT	1.31	1.59	3.83	2.60	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	364	SAT	0.43	0.99	0.65	0.79	5.60	0.41	0.13	0.07	0.17	0.91	0.18	-	✗
2026 Safenlp 2024	365	SAT	0.64	0.98	0.60	✗	5.66	0.41	0.10	0.25	0.13	0.88	0.20	-	✗
2026 Safenlp 2024	366	UNSAT	0.13	0.73	0.79	2.14	11.2	0.21	0.34	0.31	3.57	0.85	0.12	-	0.04
2026 Safenlp 2024	367	UNSAT	4.61	4.62	16.8	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	368	SAT	0.64	0.98	0.63	3.76	5.70	0.41	0.11	0.09	0.14	0.86	0.17	-	✗
2026 Safenlp 2024	369	UNSAT	0.14	0.73	0.81	2.16	10.9	0.82	0.35	0.32	3.64	-	0.19	-	0.46
2026 Safenlp 2024	370	UNSAT	5.99	6.95	10.8	13.2	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	371	UNSAT	0.90	1.50	2.12	2.35	11.1	-	10.1	-	-	-	-	-	-
2026 Safenlp 2024	372	SAT	0.63	0.97	0.65	2.25	5.51	0.41	0.10	0.09	0.11	0.82	0.18	-	✗
2026 Safenlp 2024	373	UNSAT	0.14	0.72	0.78	2.20	10.9	0.21	0.36	0.30	3.58	0.90	0.11	-	0.08
2026 Safenlp 2024	374	SAT	0.64	0.97	0.63	2.18	5.76	1.03	0.10	0.10	0.19	0.89	0.23	-	✗
2026 Safenlp 2024	375	SAT	0.53	0.97	0.64	✗	5.60	0.41	0.09	0.07	0.14	0.86	0.17	-	✗
2026 Safenlp 2024	376	UNSAT	0.14	0.73	0.79	2.24	11.0	0.21	0.34	0.30	3.55	0.88	0.12	-	-
2026 Safenlp 2024	377	SAT	0.39	0.99	0.60	0.09	5.36	0.41	0.11	0.22	0.10	0.85	0.16	0.18	✗
2026 Safenlp 2024	378	SAT	0.67	0.98	0.61	2.21	5.49	0.41	0.12	0.25	0.12	0.82	0.19	-	✗
2026 Safenlp 2024	379	SAT	0.40	0.99	0.63	3.77	5.57	0.41	0.10	0.22	0.12	0.88	0.28	-	✗
2026 Safenlp 2024	380	SAT	0.64	0.97	0.64	0.34	5.38	0.41	0.13	0.21	0.11	0.81	✗	0.44	✗
2026 Safenlp 2024	381	SAT	0.64	0.97	0.67	3.67	5.48	0.41	0.12	0.09	0.19	0.84	0.18	-	✗
2026 Safenlp 2024	382	SAT	0.53	0.98	0.62	3.81	5.46	1.23	0.10	0.10	0.10	1.67	0.19	-	✗
2026 Safenlp 2024	383	UNSAT	0.16	0.74	0.80	2.20	10.8	0.21	0.35	0.31	3.51	0.88	0.14	-	0.11
2026 Safenlp 2024	384	UNSAT	1.67	2.20	8.86	8.85	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	385	UNSAT	0.15	0.75	0.76	2.14	11.0	0.21	0.32	0.31	3.55	0.87	0.11	-	-
2026 Safenlp 2024	386	SAT	0.31	0.98	0.65	0.03	4.27	0.41	0.10	0.24	0.15	0.83	0.09	0.43	✗
2026 Safenlp 2024	387	SAT	0.61	0.97	0.62	0.40	4.96	0.41	0.12	0.07	0.13	0.86	0.18	0.60	✗
2026 Safenlp 2024	388	SAT	0.60	0.98	0.61	0.03	4.20	0.41	0.10	0.08	0.16	0.89	0.15	0.45	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	389	UNSAT	0.15	0.73	0.84	2.13	11.0	0.83	0.36	0.28	3.55	-	0.17	-	0.15
2026 Safenlp 2024	390	SAT	0.42	1.00	0.60	0.07	4.21	0.41	0.11	0.06	0.12	0.88	0.20	0.45	✗
2026 Safenlp 2024	391	SAT	0.66	0.98	0.65	2.18	5.53	0.41	0.12	0.09	0.14	0.85	0.17	-	✗
2026 Safenlp 2024	392	SAT	0.64	0.97	0.63	3.68	5.44	0.41	0.12	0.08	0.10	0.87	0.19	-	✗
2026 Safenlp 2024	393	SAT	0.56	0.98	0.64	2.38	5.78	0.41	0.11	0.08	0.22	0.89	0.18	-	✗
2026 Safenlp 2024	394	UNSAT	0.90	1.57	2.00	2.32	11.1	-	9.32	-	-	-	2.97	-	-
2026 Safenlp 2024	395	UNSAT	0.14	0.73	0.80	2.13	11.0	0.21	0.36	0.31	3.60	0.91	0.11	-	-
2026 Safenlp 2024	396	SAT	0.45	0.98	0.67	2.13	5.39	0.41	0.11	0.24	0.12	0.90	0.16	-	✗
2026 Safenlp 2024	397	SAT	0.51	0.99	0.70	0.27	5.40	0.41	0.12	0.08	0.14	0.89	0.20	0.50	✗
2026 Safenlp 2024	398	SAT	0.37	0.98	0.61	3.69	5.78	-	0.14	0.09	0.14	-	0.56	-	✗
2026 Safenlp 2024	399	SAT	0.62	0.99	0.63	✗	5.75	1.03	0.11	0.20	0.17	-	0.18	-	✗
2026 Safenlp 2024	400	SAT	0.64	0.99	0.62	3.64	5.35	0.41	0.09	0.07	0.12	0.91	0.21	-	✗
2026 Safenlp 2024	401	SAT	0.64	0.96	0.64	2.18	5.14	1.23	0.09	0.09	0.11	0.97	0.16	-	✗
2026 Safenlp 2024	402	UNSAT	0.16	0.72	0.79	2.16	10.9	0.82	0.36	0.29	3.55	-	0.16	-	0.08
2026 Safenlp 2024	403	SAT	0.51	0.99	0.61	0.05	4.31	0.41	0.11	0.08	0.12	0.85	0.19	0.54	✗
2026 Safenlp 2024	404	UNSAT	1.44	1.91	4.45	2.54	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	405	UNSAT	1.05	1.46	0.95	2.28	11.0	1.64	2.32	-	-	-	0.19	-	8.97
2026 Safenlp 2024	406	UNSAT	1.59	1.96	2.92	2.66	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	407	UNSAT	13.2	14.9	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	408	SAT	0.62	1.00	0.65	0.27	5.35	0.41	0.11	0.08	0.13	0.91	0.19	0.55	✗
2026 Safenlp 2024	409	SAT	0.63	0.98	0.64	3.75	5.52	1.03	0.12	0.08	0.13	0.97	0.18	-	✗
2026 Safenlp 2024	410	SAT	0.38	0.97	0.62	2.20	5.49	0.41	0.10	0.07	0.17	0.83	0.20	-	✗
2026 Safenlp 2024	411	SAT	0.47	0.99	0.64	0.07	5.43	0.42	0.11	0.10	0.12	0.84	✗	-	✗
2026 Safenlp 2024	412	SAT	0.37	0.98	0.67	✗	5.67	0.41	0.11	0.09	0.15	0.88	0.17	-	✗
2026 Safenlp 2024	413	SAT	0.53	0.98	0.67	3.68	5.45	0.41	0.12	0.11	0.14	0.87	0.18	-	✗
2026 Safenlp 2024	414	SAT	0.43	0.98	0.62	0.04	4.24	0.41	0.12	0.08	0.11	0.84	0.13	0.49	✗
2026 Safenlp 2024	415	SAT	0.60	0.97	0.65	✗	5.62	1.03	0.11	0.13	0.18	0.89	0.23	-	✗
2026 Safenlp 2024	416	SAT	0.64	0.98	0.66	2.26	5.34	0.41	0.09	0.08	0.12	0.84	✗	-	✗
2026 Safenlp 2024	417	UNSAT	0.90	1.45	1.74	2.28	11.2	6.35	9.14	-	-	-	1.05	-	-
2026 Safenlp 2024	418	SAT	0.60	0.97	0.65	0.07	4.30	0.41	0.11	0.16	0.13	0.86	0.20	0.49	✗
2026 Safenlp 2024	419	UNSAT	2.17	3.23	10.6	13.6	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	420	UNSAT	1.47	2.59	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	421	SAT	0.34	0.99	0.65	0.04	5.49	0.41	0.10	0.07	0.10	0.90	0.19	0.48	✗
2026 Safenlp 2024	422	SAT	0.65	0.98	0.62	0.30	5.43	0.41	0.11	0.10	0.11	0.93	0.20	-	✗
2026 Safenlp 2024	423	SAT	0.54	0.98	0.61	2.36	5.45	0.41	0.10	0.09	0.14	0.89	0.23	-	✗
2026 Safenlp 2024	424	UNSAT	0.87	1.43	1.16	2.21	11.0	1.85	6.58	-	-	-	0.46	-	16.7
2026 Safenlp 2024	425	SAT	0.53	0.98	0.65	3.65	5.34	1.03	0.11	0.10	0.14	1.37	0.16	-	✗
2026 Safenlp 2024	426	SAT	0.36	0.99	0.65	2.19	5.60	0.41	0.12	0.27	0.13	0.85	0.14	-	✗
2026 Safenlp 2024	427	UNSAT	0.95	1.46	0.95	2.29	10.9	0.82	2.24	-	-	-	0.22	-	10.1
2026 Safenlp 2024	428	UNSAT	0.13	0.74	0.77	2.12	11.0	0.21	0.34	0.47	3.56	0.89	0.11	-	0.04
2026 Safenlp 2024	429	UNSAT	3.09	3.88	5.09	3.30	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	430	UNSAT	1.20	1.51	1.66	2.26	11.0	7.59	7.20	-	-	-	1.61	-	-
2026 Safenlp 2024	431	UNSAT	0.93	1.45	1.29	2.19	11.0	1.64	5.81	-	-	-	0.80	-	15.5
2026 Safenlp 2024	432	SAT	0.66	0.98	0.66	3.87	5.48	0.41	0.12	0.06	0.13	0.87	0.18	-	✗
2026 Safenlp 2024	433	SAT	0.49	0.99	0.64	0.04	4.99	0.41	0.10	0.08	0.13	0.91	0.19	0.42	✗
2026 Safenlp 2024	434	SAT	0.36	0.97	0.61	0.20	5.27	0.41	0.12	0.26	0.12	0.86	0.21	0.44	✗
2026 Safenlp 2024	435	SAT	0.60	0.98	0.64	2.18	4.19	0.41	0.11	0.07	0.13	0.90	0.19	-	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	436	SAT	0.44	1.00	0.66	3.68	5.50	0.41	0.09	0.25	0.15	0.90	✗	-	✗
2026 Safenlp 2024	437	SAT	0.50	0.98	0.64	0.21	5.41	0.41	0.09	0.07	0.12	0.90	✗	0.51	✗
2026 Safenlp 2024	438	UNSAT	1.28	1.51	2.35	2.26	11.1	4.31	8.58	-	-	-	1.60	-	-
2026 Safenlp 2024	439	UNSAT	1.18	1.56	3.18	2.43	-	13.1	17.2	-	-	-	15.0	-	-
2026 Safenlp 2024	440	SAT	0.60	0.99	0.62	2.00	4.29	0.41	0.11	0.25	0.11	0.86	✗	-	✗
2026 Safenlp 2024	441	UNSAT	1.07	1.51	3.20	2.42	-	10.5	12.9	-	-	-	-	-	-
2026 Safenlp 2024	442	SAT	0.66	0.97	0.67	2.19	6.31	0.41	0.10	0.17	0.13	0.91	0.19	-	✗
2026 Safenlp 2024	443	SAT	0.53	0.96	0.65	✗	5.45	0.41	0.11	0.11	0.16	0.91	✗	-	✗
2026 Safenlp 2024	444	SAT	0.66	1.01	0.61	1.05	5.43	0.41	0.11	0.08	0.11	0.89	0.18	0.44	✗
2026 Safenlp 2024	445	UNSAT	0.15	0.74	0.79	2.11	11.0	0.21	0.34	0.30	3.53	0.92	0.10	-	0.07
2026 Safenlp 2024	446	SAT	0.59	0.99	0.69	2.17	5.45	0.41	0.11	0.26	0.11	0.85	0.18	-	✗
2026 Safenlp 2024	447	UNSAT	1.68	1.85	8.70	2.63	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	448	UNSAT	0.15	0.75	0.79	2.23	10.9	0.21	0.36	0.47	3.55	0.81	0.12	-	-
2026 Safenlp 2024	449	UNSAT	1.00	1.51	2.37	2.26	-	-	11.7	-	-	-	9.69	-	-
2026 Safenlp 2024	450	UNSAT	1.86	2.24	15.4	3.12	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	451	SAT	0.45	0.99	0.66	0.22	5.56	0.41	0.11	0.09	0.15	0.90	0.21	-	✗
2026 Safenlp 2024	452	SAT	0.63	1.00	0.70	2.26	5.41	0.41	0.12	0.09	0.12	0.90	0.21	-	✗
2026 Safenlp 2024	453	SAT	0.37	0.99	0.67	3.72	5.36	0.41	0.12	0.09	0.11	0.88	0.23	-	✗
2026 Safenlp 2024	454	SAT	0.67	0.97	0.62	3.67	5.67	0.41	0.11	0.12	0.15	0.85	0.13	-	✗
2026 Safenlp 2024	455	SAT	0.53	0.99	0.62	0.04	5.01	0.42	0.11	0.10	0.12	0.87	✗	0.44	✗
2026 Safenlp 2024	456	SAT	0.45	0.98	0.63	✗	5.42	0.41	0.11	0.09	0.11	0.86	0.20	-	✗
2026 Safenlp 2024	457	SAT	0.61	1.00	0.59	0.14	4.23	0.41	0.12	0.08	0.13	0.93	0.18	0.70	✗
2026 Safenlp 2024	458	SAT	0.65	0.98	0.62	3.67	5.46	1.03	0.10	0.08	0.12	0.86	0.18	-	✗
2026 Safenlp 2024	459	SAT	0.63	0.99	0.67	0.72	5.38	0.41	0.12	0.11	0.16	0.85	0.18	-	✗
2026 Safenlp 2024	460	SAT	0.43	1.00	0.62	2.17	5.48	0.41	0.11	0.24	0.12	0.87	0.19	-	✗
2026 Safenlp 2024	461	UNSAT	1.07	1.45	1.17	2.20	11.2	1.65	3.51	-	-	-	1.18	-	12.2
2026 Safenlp 2024	462	UNSAT	0.16	0.74	0.77	2.13	11.0	0.21	0.35	0.31	3.53	0.83	0.18	-	0.02
2026 Safenlp 2024	463	SAT	0.66	0.98	0.64	3.94	6.12	0.41	0.11	0.16	0.15	0.87	0.38	-	✗
2026 Safenlp 2024	464	SAT	0.65	1.00	0.65	0.68	4.95	0.41	0.10	0.10	0.12	0.84	0.18	-	✗
2026 Safenlp 2024	465	SAT	0.49	0.99	0.65	0.02	5.38	0.41	0.11	0.07	0.15	0.85	0.19	0.51	✗
2026 Safenlp 2024	466	UNSAT	0.15	0.76	0.79	2.15	10.9	0.21	0.36	0.31	3.53	0.83	0.12	-	0.07
2026 Safenlp 2024	467	SAT	0.60	0.98	0.68	3.72	6.06	1.23	0.09	0.18	0.15	-	0.28	-	✗
2026 Safenlp 2024	468	SAT	0.51	0.99	0.67	2.24	5.49	0.42	0.11	0.08	0.12	0.88	0.19	-	✗
2026 Safenlp 2024	469	SAT	0.64	0.98	0.67	0.32	5.35	0.41	0.10	0.09	0.12	0.88	0.18	-	✗
2026 Safenlp 2024	470	UNSAT	0.23	1.41	0.80	2.21	11.2	0.82	0.60	0.30	3.90	-	0.15	-	5.91
2026 Safenlp 2024	471	SAT	0.48	1.00	0.70	1.32	4.20	0.41	0.12	0.06	0.16	0.92	0.18	0.29	✗
2026 Safenlp 2024	472	UNSAT	1.08	1.51	2.56	2.41	11.0	-	9.95	-	-	-	10.2	-	-
2026 Safenlp 2024	473	SAT	0.60	0.98	0.63	2.40	5.58	0.41	0.11	0.09	0.16	0.86	0.20	-	✗
2026 Safenlp 2024	474	SAT	0.66	0.98	0.63	✗	5.40	0.41	0.12	0.07	0.11	0.88	0.21	-	✗
2026 Safenlp 2024	475	SAT	0.57	0.97	0.63	✗	5.27	0.41	0.11	0.08	0.12	0.90	0.18	-	✗
2026 Safenlp 2024	476	SAT	0.63	0.99	0.61	2.20	5.55	0.41	0.11	0.08	0.15	0.87	0.17	-	✗
2026 Safenlp 2024	477	UNSAT	0.98	1.55	10.0	3.10	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	478	UNSAT	1.72	1.98	4.45	2.76	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	479	UNSAT	0.17	0.74	0.78	2.12	11.0	0.21	0.35	0.33	3.55	0.85	0.11	-	-
2026 Safenlp 2024	480	UNSAT	0.97	1.48	1.69	2.23	-	3.90	12.6	-	-	-	2.81	-	-
2026 Safenlp 2024	481	SAT	0.62	0.97	0.64	3.74	5.50	0.21	0.11	0.09	0.13	0.93	0.18	-	✗
2026 Safenlp 2024	482	UNSAT	0.14	0.74	0.79	2.11	11.0	0.21	0.37	0.29	3.55	0.84	0.12	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	483	SAT	0.63	0.97	0.62	2.16	5.42	0.41	0.11	0.07	0.10	0.88	0.17	-	✗
2026 Safenlp 2024	484	SAT	0.56	0.97	0.65	2.27	5.62	0.41	0.11	0.08	0.14	0.88	0.18	-	✗
2026 Safenlp 2024	485	SAT	0.44	0.98	0.66	2.24	5.77	0.41	0.10	0.10	0.11	0.90	0.20	-	✗
2026 Safenlp 2024	486	UNSAT	1.59	1.84	6.95	2.82	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	487	SAT	0.50	0.97	0.63	✗	5.52	0.41	0.12	0.25	0.18	0.89	0.19	-	✗
2026 Safenlp 2024	488	UNSAT	0.13	0.75	0.76	2.16	10.9	0.21	0.34	0.30	3.55	0.84	0.10	-	0.07
2026 Safenlp 2024	489	UNSAT	1.43	2.08	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	490	SAT	0.60	1.00	0.65	0.11	4.23	0.41	0.11	0.06	0.12	0.89	✗	0.52	✗
2026 Safenlp 2024	491	SAT	0.60	0.98	0.66	3.65	5.45	0.41	0.12	0.08	0.12	0.86	0.18	-	✗
2026 Safenlp 2024	492	SAT	0.66	1.00	0.63	3.66	5.54	0.41	0.09	0.07	0.12	0.87	0.22	-	✗
2026 Safenlp 2024	493	SAT	0.64	0.98	0.61	1.24	5.38	0.41	0.11	0.11	0.12	0.89	0.21	-	✗
2026 Safenlp 2024	494	UNSAT	0.13	0.76	0.79	2.23	11.0	0.21	0.36	0.31	3.59	0.82	0.15	-	-
2026 Safenlp 2024	495	SAT	0.65	1.00	0.64	✗	5.45	0.41	0.09	0.14	0.12	0.83	0.18	-	✗
2026 Safenlp 2024	496	SAT	0.65	1.00	0.63	3.77	5.51	0.41	0.10	0.09	0.12	0.86	0.16	-	✗
2026 Safenlp 2024	497	UNSAT	0.87	1.46	1.08	2.22	11.0	1.44	3.05	-	-	-	0.19	-	10.2
2026 Safenlp 2024	498	UNSAT	0.14	0.77	0.78	2.16	10.9	0.21	0.35	0.30	3.56	0.94	0.12	-	0.07
2026 Safenlp 2024	499	SAT	0.61	1.01	0.65	0.03	4.89	0.41	0.11	0.06	0.15	0.84	0.17	0.38	✗
2026 Safenlp 2024	500	SAT	0.44	1.00	0.66	0.06	5.29	0.41	0.11	0.04	0.10	0.88	0.17	0.40	✗
2026 Safenlp 2024	501	UNSAT	6.98	7.77	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	502	SAT	0.34	1.00	0.67	0.04	5.38	0.41	0.10	0.04	0.11	0.87	0.16	0.42	✗
2026 Safenlp 2024	503	UNSAT	2.34	3.66	13.9	3.32	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	504	SAT	0.56	0.99	0.63	3.66	5.51	0.41	0.11	0.09	0.12	0.91	0.21	-	✗
2026 Safenlp 2024	505	SAT	0.42	0.98	0.64	✗	6.82	1.44	0.11	0.33	0.17	-	0.39	-	✗
2026 Safenlp 2024	506	UNSAT	0.14	0.72	0.77	2.14	10.9	0.21	0.33	0.31	3.55	0.88	0.10	-	0.07
2026 Safenlp 2024	507	SAT	0.64	0.98	0.63	2.22	5.62	0.41	0.11	0.07	0.12	0.85	0.18	-	✗
2026 Safenlp 2024	508	SAT	0.60	0.98	0.67	0.38	4.26	0.41	0.11	0.06	0.10	0.92	0.18	0.46	✗
2026 Safenlp 2024	509	UNSAT	0.14	0.75	0.81	2.16	10.9	0.21	0.34	0.47	3.53	0.91	0.16	-	-
2026 Safenlp 2024	510	SAT	0.47	0.98	0.64	0.06	5.36	0.41	0.09	0.19	0.10	0.87	0.23	0.44	✗
2026 Safenlp 2024	511	SAT	0.38	0.98	0.63	2.19	5.49	0.41	0.12	0.10	0.15	0.90	✗	-	✗
2026 Safenlp 2024	512	UNSAT	1.05	1.45	2.77	2.21	-	-	17.8	-	-	-	-	-	-
2026 Safenlp 2024	513	SAT	0.56	0.99	0.69	2.17	5.44	0.41	0.12	0.09	0.44	0.86	0.18	-	✗
2026 Safenlp 2024	514	UNSAT	0.14	0.74	0.79	2.19	10.9	0.21	0.35	0.32	4.04	0.84	0.13	-	0.06
2026 Safenlp 2024	515	UNSAT	2.17	2.38	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	516	SAT	0.45	0.98	0.66	✗	5.50	1.24	0.12	0.09	0.19	0.93	0.20	-	✗
2026 Safenlp 2024	517	SAT	0.59	0.98	0.65	0.12	4.26	0.41	0.12	0.05	0.14	0.85	0.25	0.33	✗
2026 Safenlp 2024	518	SAT	0.61	0.97	0.67	0.03	5.33	0.41	0.11	0.06	0.52	0.83	0.18	0.44	✗
2026 Safenlp 2024	519	UNSAT	0.15	0.74	0.78	2.17	11.0	0.21	0.33	0.49	3.85	0.87	0.11	-	0.12
2026 Safenlp 2024	520	SAT	0.48	0.97	0.66	1.29	5.39	0.41	0.12	0.19	0.15	0.84	0.20	-	✗
2026 Safenlp 2024	521	UNSAT	0.14	0.72	0.83	2.13	10.9	0.21	0.36	0.41	3.55	0.89	0.12	-	-
2026 Safenlp 2024	522	SAT	0.58	0.98	0.62	3.61	5.56	0.41	0.12	0.19	0.13	0.85	0.16	-	✗
2026 Safenlp 2024	523	SAT	0.57	0.98	0.65	✗	5.39	0.21	0.12	0.12	0.15	0.87	0.17	-	✗
2026 Safenlp 2024	524	UNSAT	0.85	1.43	1.60	2.20	11.0	1.64	7.41	-	-	-	0.69	-	-
2026 Safenlp 2024	525	SAT	0.63	0.98	0.64	2.17	5.41	0.41	0.10	0.09	0.13	0.87	0.19	-	✗
2026 Safenlp 2024	526	SAT	0.65	0.98	0.66	4.26	6.52	1.23	0.11	0.23	0.14	-	-	-	✗
2026 Safenlp 2024	527	UNSAT	0.14	0.74	0.77	2.23	11.0	0.21	0.36	0.46	3.54	0.88	0.10	-	-
2026 Safenlp 2024	528	UNSAT	1.18	1.50	5.87	2.43	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	529	SAT	0.39	1.02	0.65	✗	6.25	0.21	0.12	0.36	0.15	0.93	0.15	-	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	530	SAT	0.49	0.97	0.65	✗	6.16	1.03	0.10	0.31	0.12	-	0.19	-	✗
2026 Safenlp 2024	531	UNSAT	0.97	1.54	2.83	2.38	-	-	17.7	-	-	-	-	-	-
2026 Safenlp 2024	532	SAT	0.53	0.97	0.62	2.20	5.38	0.41	0.11	0.09	0.13	0.89	0.21	0.65	✗
2026 Safenlp 2024	533	UNSAT	1.54	1.87	8.01	2.46	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	534	UNSAT	1.07	1.45	1.20	2.31	11.1	1.85	2.88	-	-	-	0.29	-	8.15
2026 Safenlp 2024	535	SAT	0.66	1.01	0.66	2.30	5.50	1.03	0.12	0.15	0.14	0.82	0.20	-	✗
2026 Safenlp 2024	536	SAT	0.69	1.01	0.63	3.70	5.40	0.41	0.10	0.06	0.12	0.84	0.18	-	✗
2026 Safenlp 2024	537	SAT	0.39	0.99	0.66	0.03	4.26	0.41	0.11	0.10	0.12	0.91	0.19	0.44	✗
2026 Safenlp 2024	538	SAT	0.65	0.96	0.61	✗	5.37	0.41	0.11	0.07	0.12	0.82	0.19	-	✗
2026 Safenlp 2024	539	SAT	0.59	0.97	0.62	0.06	4.22	0.41	0.12	0.08	0.14	0.89	0.25	0.41	✗
2026 Safenlp 2024	540	UNSAT	1.01	1.44	1.34	2.28	11.1	3.08	4.65	-	-	-	1.55	-	-
2026 Safenlp 2024	541	UNSAT	0.13	0.74	0.79	2.11	10.9	0.21	0.35	0.46	3.57	0.87	0.12	-	-
2026 Safenlp 2024	542	SAT	0.43	0.97	0.62	3.76	5.97	0.41	0.12	0.23	0.13	0.84	0.19	-	✗
2026 Safenlp 2024	543	UNSAT	2.79	2.42	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	544	UNSAT	1.83	2.17	8.08	2.89	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	545	UNSAT	2.96	3.99	17.0	9.69	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	546	UNSAT	0.92	1.47	2.69	2.62	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	547	SAT	0.45	0.97	0.66	0.74	5.42	0.21	0.10	0.08	0.25	0.90	0.17	0.59	✗
2026 Safenlp 2024	548	UNSAT	0.17	0.73	0.79	2.13	11.0	0.21	0.35	0.28	3.68	0.90	0.12	-	0.08
2026 Safenlp 2024	549	UNSAT	0.14	0.73	0.77	2.23	10.9	0.21	0.36	0.26	3.71	0.86	0.10	-	0.37
2026 Safenlp 2024	550	SAT	0.65	0.98	0.63	0.12	5.30	0.41	0.10	0.16	0.29	0.88	0.23	-	✗
2026 Safenlp 2024	551	UNSAT	1.35	1.96	7.52	2.60	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	552	UNSAT	1.30	1.65	7.62	2.45	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	553	UNSAT	0.14	0.73	0.78	2.12	10.9	0.21	0.34	0.46	3.71	0.90	0.11	-	0.08
2026 Safenlp 2024	554	SAT	0.60	0.97	0.62	<0.01	4.28	0.41	0.12	0.10	0.25	0.85	0.20	0.43	✗
2026 Safenlp 2024	555	SAT	0.65	0.97	0.64	✗	5.52	0.21	0.12	0.09	0.23	0.90	✗	-	✗
2026 Safenlp 2024	556	SAT	0.43	0.98	0.71	0.07	4.27	0.41	0.11	0.02	0.25	0.85	0.19	0.50	✗
2026 Safenlp 2024	557	SAT	0.54	0.98	0.66	0.20	5.52	0.41	0.11	0.13	0.28	0.91	0.18	0.56	✗
2026 Safenlp 2024	558	UNSAT	1.04	1.44	0.94	2.30	11.0	0.82	2.95	-	-	-	0.23	-	5.89
2026 Safenlp 2024	559	UNSAT	1.17	1.42	0.90	2.20	10.9	1.23	2.32	-	-	-	0.20	-	4.99
2026 Safenlp 2024	560	SAT	0.39	0.98	0.66	2.56	-	-	0.12	-	0.52	-	-	-	✗
2026 Safenlp 2024	561	SAT	0.61	0.97	0.61	0.03	4.25	0.41	0.12	0.08	0.22	0.90	0.19	0.47	✗
2026 Safenlp 2024	562	UNSAT	1.17	1.45	1.26	2.20	11.0	1.44	4.79	-	-	-	0.69	-	14.3
2026 Safenlp 2024	563	SAT	0.59	0.97	0.65	3.76	5.51	0.41	0.10	0.06	0.24	0.86	0.17	-	✗
2026 Safenlp 2024	564	UNSAT	0.89	1.44	1.50	2.18	11.1	1.64	8.08	-	-	-	0.85	-	17.6
2026 Safenlp 2024	565	SAT	0.62	0.99	0.62	0.11	4.25	0.41	0.09	0.06	0.23	0.84	0.18	0.62	✗
2026 Safenlp 2024	566	SAT	0.63	0.98	0.63	3.64	5.38	0.41	0.11	0.09	0.25	0.87	0.21	-	✗
2026 Safenlp 2024	567	SAT	0.47	0.98	0.62	✗	5.48	0.41	0.11	0.24	0.25	0.82	0.18	-	✗
2026 Safenlp 2024	568	SAT	0.62	0.99	0.62	0.05	4.98	0.21	0.12	0.08	0.23	0.87	✗	0.44	✗
2026 Safenlp 2024	569	SAT	0.63	0.99	0.64	0.11	5.44	0.41	0.08	0.09	0.24	0.81	0.18	0.41	✗
2026 Safenlp 2024	570	UNSAT	0.14	0.73	0.84	2.14	10.9	0.21	0.34	0.31	3.64	0.84	0.11	-	0.10
2026 Safenlp 2024	571	SAT	0.64	0.98	0.71	✗	6.12	1.23	0.13	0.10	0.23	0.89	0.19	-	✗
2026 Safenlp 2024	572	UNSAT	1.01	1.44	1.72	2.18	11.0	6.97	7.24	-	-	-	1.09	-	-
2026 Safenlp 2024	573	SAT	0.66	0.97	0.65	3.76	5.59	0.41	0.12	0.29	0.13	0.90	0.15	-	✗
2026 Safenlp 2024	574	SAT	0.65	0.98	0.62	2.17	5.35	0.41	0.10	0.08	0.13	0.87	0.17	-	✗
2026 Safenlp 2024	575	UNSAT	0.19	1.44	0.81	2.27	11.1	0.82	0.59	0.47	3.91	-	0.15	-	0.04
2026 Safenlp 2024	576	SAT	0.51	0.99	0.61	0.01	4.24	0.41	0.10	0.09	0.16	0.86	0.19	0.37	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	577	UNSAT	1.24	1.72	4.30	2.46	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	578	UNSAT	1.04	1.45	1.43	2.22	11.0	1.23	4.23	-	-	-	0.43	-	13.3
2026 Safenlp 2024	579	SAT	0.36	0.99	0.66	3.76	6.28	0.41	0.11	0.08	0.12	0.90	0.18	-	✗
2026 Safenlp 2024	580	UNSAT	1.03	1.56	2.64	2.45	-	-	9.35	-	-	-	14.1	-	-
2026 Safenlp 2024	581	SAT	0.62	0.99	0.66	0.12	5.48	0.41	0.10	0.07	0.14	0.86	0.19	0.45	✗
2026 Safenlp 2024	582	SAT	0.65	1.01	0.66	3.76	5.44	0.41	0.12	0.09	0.12	0.88	0.19	-	✗
2026 Safenlp 2024	583	SAT	0.66	0.99	0.69	✗	6.59	1.03	0.10	0.31	0.13	-	0.22	-	✗
2026 Safenlp 2024	584	UNSAT	1.50	2.07	7.02	2.67	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	585	UNSAT	1.04	1.46	0.96	2.23	11.0	0.82	3.01	-	-	-	0.29	-	5.96
2026 Safenlp 2024	586	UNSAT	0.14	0.74	0.81	2.15	10.9	0.82	0.35	0.47	3.53	-	0.19	-	0.08
2026 Safenlp 2024	587	SAT	0.35	1.00	0.65	0.03	5.46	0.41	0.11	0.06	0.11	0.90	0.19	0.42	✗
2026 Safenlp 2024	588	SAT	0.62	0.99	0.66	2.18	4.26	0.41	0.10	0.24	0.16	0.89	0.21	-	✗
2026 Safenlp 2024	589	UNSAT	1.27	1.75	4.41	2.45	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	590	SAT	0.60	0.97	0.64	0.12	4.28	0.41	0.11	0.08	0.11	0.92	0.22	0.47	✗
2026 Safenlp 2024	591	SAT	0.51	0.97	0.64	0.02	4.31	0.41	0.11	0.09	0.13	0.87	0.17	0.40	✗
2026 Safenlp 2024	592	UNSAT	0.87	1.45	1.42	2.20	11.0	4.71	5.39	-	-	-	1.74	-	17.5
2026 Safenlp 2024	593	SAT	0.34	0.97	0.65	0.15	5.58	0.41	0.12	0.23	0.13	0.84	0.23	0.42	✗
2026 Safenlp 2024	594	SAT	0.40	0.97	0.64	2.29	5.39	0.41	0.09	0.08	0.13	0.86	0.17	-	✗
2026 Safenlp 2024	595	SAT	0.66	0.96	0.64	2.18	5.38	1.03	0.11	0.10	0.13	0.86	✗	-	✗
2026 Safenlp 2024	596	SAT	0.61	0.97	0.66	0.19	4.24	0.41	0.11	0.25	0.11	0.89	✗	-	✗
2026 Safenlp 2024	597	UNSAT	2.21	2.61	-	3.64	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	598	SAT	0.63	0.98	0.63	3.67	5.49	0.41	0.10	0.09	0.13	0.87	0.19	-	✗
2026 Safenlp 2024	599	SAT	0.48	0.99	0.63	✗	5.35	1.03	0.12	0.16	0.12	0.89	0.20	-	✗
2026 Safenlp 2024	600	SAT	0.65	0.99	0.65	4.40	6.22	1.65	0.11	-	0.12	1.07	0.43	-	✗
2026 Safenlp 2024	601	SAT	0.65	0.98	0.63	3.91	8.72	-	0.11	0.33	0.12	-	-	-	✗
2026 Safenlp 2024	602	SAT	0.62	0.98	0.62	3.93	6.15	0.41	0.11	0.10	0.13	0.84	0.60	-	✗
2026 Safenlp 2024	603	SAT	0.49	0.97	0.69	0.26	4.28	0.41	0.11	0.09	0.11	0.82	0.62	0.47	✗
2026 Safenlp 2024	604	SAT	0.65	0.99	0.66	3.83	6.27	1.23	0.10	0.30	0.15	-	0.63	-	✗
2026 Safenlp 2024	605	SAT	0.63	0.97	0.61	1.41	5.23	0.41	0.11	0.09	0.11	0.84	0.66	0.50	✗
2026 Safenlp 2024	606	SAT	0.65	1.00	0.63	3.68	5.71	1.64	0.09	0.25	0.14	-	0.82	-	✗
2026 Safenlp 2024	607	UNSAT	1.19	1.51	2.63	2.27	-	10.3	16.3	-	-	-	-	-	-
2026 Safenlp 2024	608	UNSAT	1.26	1.56	4.54	2.36	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	609	SAT	0.64	0.99	0.67	2.35	5.50	0.41	0.11	0.09	0.14	0.88	0.63	-	✗
2026 Safenlp 2024	610	SAT	0.55	0.99	0.64	3.64	5.68	0.41	0.11	0.10	0.12	0.88	0.69	-	✗
2026 Safenlp 2024	611	SAT	0.53	0.97	0.65	✗	5.42	0.41	0.12	0.08	0.12	0.85	0.62	-	✗
2026 Safenlp 2024	612	SAT	0.66	0.98	0.62	3.67	5.46	0.41	0.10	0.08	0.13	0.82	0.65	-	✗
2026 Safenlp 2024	613	SAT	0.57	0.99	0.62	3.63	5.31	1.03	0.10	0.24	0.14	0.99	0.59	-	✗
2026 Safenlp 2024	614	SAT	0.65	0.97	0.63	✗	5.67	0.41	0.11	0.09	0.13	0.83	0.63	-	✗
2026 Safenlp 2024	615	SAT	0.67	0.98	0.65	2.33	5.66	1.64	0.12	0.18	0.19	-	-	-	✗
2026 Safenlp 2024	616	UNSAT	0.15	0.73	0.78	2.14	10.9	0.21	0.34	0.32	3.54	0.86	1.36	-	0.11
2026 Safenlp 2024	617	UNSAT	0.14	0.74	0.80	2.12	10.9	0.21	0.35	0.31	3.55	0.85	0.49	-	-
2026 Safenlp 2024	618	SAT	0.44	0.97	0.64	3.71	6.28	1.03	0.11	0.15	0.17	-	0.65	-	✗
2026 Safenlp 2024	619	UNSAT	1.12	1.55	2.90	2.60	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	620	SAT	0.64	0.99	0.64	4.10	6.25	1.44	0.11	0.11	0.15	-	-	-	✗
2026 Safenlp 2024	621	UNSAT	0.16	0.73	0.76	2.21	10.9	0.21	0.36	0.46	3.54	0.89	0.46	-	0.05
2026 Safenlp 2024	622	SAT	0.53	0.99	0.64	2.17	4.27	0.41	0.12	0.22	0.14	0.89	0.67	-	✗
2026 Safenlp 2024	623	UNSAT	0.14	0.75	0.79	2.11	11.0	0.21	0.34	0.31	3.53	0.89	0.52	-	0.08

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	624	UNSAT	0.15	0.74	0.79	2.17	11.0	0.21	0.34	0.31	3.53	0.87	0.94	-	-
2026 Safenlp 2024	625	SAT	0.63	0.99	0.66	✗	5.39	0.41	0.12	0.09	0.14	0.85	0.60	-	✗
2026 Safenlp 2024	626	UNSAT	2.03	2.67	12.7	3.61	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	627	SAT	0.66	0.97	0.63	✗	5.58	0.41	0.10	0.08	0.13	0.81	0.64	-	✗
2026 Safenlp 2024	628	SAT	0.48	0.97	0.62	0.03	4.25	0.41	0.12	0.08	0.10	0.85	0.46	0.44	✗
2026 Safenlp 2024	629	SAT	0.37	0.96	0.63	2.25	5.32	0.41	0.12	0.09	0.13	0.91	0.57	-	✗
2026 Safenlp 2024	630	UNSAT	0.88	1.45	1.15	2.20	11.0	2.46	5.47	-	-	-	1.83	-	-
2026 Safenlp 2024	631	UNSAT	0.14	0.73	0.75	2.12	10.9	0.21	0.36	0.28	3.54	0.84	0.44	-	0.05
2026 Safenlp 2024	632	SAT	0.66	0.98	0.62	2.34	5.45	0.41	0.10	0.10	0.11	0.91	0.68	-	✗
2026 Safenlp 2024	633	SAT	0.53	0.97	0.61	2.23	5.50	0.41	0.10	0.09	0.16	0.86	0.57	-	✗
2026 Safenlp 2024	634	UNSAT	1.37	2.02	3.67	2.85	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	635	SAT	0.50	0.98	0.62	0.02	4.21	0.41	0.12	0.08	0.11	0.92	0.65	0.51	✗
2026 Safenlp 2024	636	SAT	0.59	0.97	0.63	0.49	4.94	0.41	0.11	0.09	0.11	0.86	0.65	0.60	✗
2026 Safenlp 2024	637	SAT	0.63	0.98	0.64	<0.01	5.36	0.41	0.11	0.09	0.13	0.87	0.63	0.49	✗
2026 Safenlp 2024	638	UNSAT	1.20	1.43	2.08	2.19	11.0	2.05	8.25	-	-	-	6.15	-	-
2026 Safenlp 2024	639	UNSAT	0.18	0.73	0.78	2.14	10.9	0.21	0.36	0.33	3.54	0.85	0.47	-	0.12
2026 Safenlp 2024	640	SAT	0.73	1.03	0.67	2.18	5.78	1.23	0.11	0.09	0.16	0.90	0.60	-	✗
2026 Safenlp 2024	641	SAT	0.70	0.98	0.65	3.68	5.57	0.42	0.11	0.10	0.17	0.85	0.66	-	✗
2026 Safenlp 2024	642	SAT	0.46	0.98	0.63	0.24	5.47	0.41	0.09	0.08	0.10	0.84	✗	0.52	✗
2026 Safenlp 2024	643	SAT	0.65	0.98	0.61	3.69	5.23	0.41	0.10	0.24	0.12	0.86	0.70	-	✗
2026 Safenlp 2024	644	SAT	0.44	0.98	0.66	2.27	5.67	1.03	0.11	0.26	0.12	0.92	0.72	-	✗
2026 Safenlp 2024	645	SAT	0.60	0.98	0.62	0.20	5.39	0.41	0.11	0.09	0.12	0.85	0.61	-	✗
2026 Safenlp 2024	646	UNSAT	0.17	0.74	0.76	2.22	11.0	0.21	0.36	0.32	3.61	0.87	0.47	-	0.11
2026 Safenlp 2024	647	SAT	0.51	0.97	0.63	2.27	5.58	0.41	0.12	0.25	0.12	0.87	✗	-	✗
2026 Safenlp 2024	648	SAT	0.54	0.98	0.65	3.82	6.09	0.41	0.11	0.09	0.12	0.88	1.47	-	✗
2026 Safenlp 2024	649	UNSAT	2.50	2.70	9.14	3.78	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	650	UNSAT	1.33	1.56	5.90	2.35	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	651	UNSAT	0.17	0.73	0.79	2.21	11.0	0.21	0.36	0.34	3.50	0.87	0.48	-	-
2026 Safenlp 2024	652	SAT	0.58	0.98	0.65	3.74	5.65	0.21	0.12	0.16	0.02	0.88	0.60	-	✗
2026 Safenlp 2024	653	UNSAT	0.98	1.48	2.52	2.25	-	5.12	-	-	-	-	-	-	-
2026 Safenlp 2024	654	UNSAT	1.26	1.55	3.91	2.31	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	655	SAT	0.68	1.00	0.67	✗	5.30	0.41	0.11	0.07	<0.01	0.84	0.64	-	✗
2026 Safenlp 2024	656	SAT	0.51	0.99	0.67	2.19	5.75	0.41	0.12	0.04	<0.01	0.85	0.62	-	✗
2026 Safenlp 2024	657	SAT	0.58	0.98	0.64	2.15	5.56	0.41	0.10	0.07	0.03	0.89	0.64	-	✗
2026 Safenlp 2024	658	SAT	0.70	0.99	0.65	3.67	5.48	1.03	0.11	0.08	0.02	1.01	0.74	-	✗
2026 Safenlp 2024	659	SAT	0.67	0.99	0.64	0.76	5.39	0.41	0.11	0.08	0.01	0.84	0.70	0.32	✗
2026 Safenlp 2024	660	SAT	0.40	0.98	0.62	0.05	5.44	0.41	0.10	0.09	0.01	0.83	✗	0.47	✗
2026 Safenlp 2024	661	SAT	0.42	0.99	0.60	✗	5.38	1.03	0.12	0.17	0.02	1.26	0.75	-	✗
2026 Safenlp 2024	662	SAT	0.53	0.99	0.66	2.24	5.48	0.41	0.12	0.06	0.02	0.83	0.63	-	✗
2026 Safenlp 2024	663	SAT	0.65	0.98	0.67	2.26	6.17	1.23	0.12	0.08	<0.01	-	✗	-	✗
2026 Safenlp 2024	664	SAT	0.68	0.99	0.65	3.76	-	1.64	0.13	0.30	0.02	-	2.41	-	✗
2026 Safenlp 2024	665	SAT	0.65	1.00	0.64	2.25	5.44	0.41	0.12	0.11	0.08	0.83	0.58	-	✗
2026 Safenlp 2024	666	SAT	0.67	0.97	0.67	3.75	-	-	0.12	-	0.23	-	✗	-	✗
2026 Safenlp 2024	667	SAT	0.68	0.97	0.63	0.23	5.32	0.41	0.10	0.08	0.31	0.88	0.63	-	✗
2026 Safenlp 2024	668	SAT	0.61	0.98	0.64	2.34	6.34	10.0	0.12	0.37	0.17	-	0.80	-	✗
2026 Safenlp 2024	669	UNSAT	1.08	1.51	1.77	2.26	11.1	8.62	8.44	-	-	-	13.2	-	-
2026 Safenlp 2024	670	SAT	0.65	0.98	0.67	2.06	5.05	0.21	0.11	0.08	0.31	0.87	0.61	-	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	671	SAT	0.39	0.97	0.65	1.13	5.39	0.41	0.12	0.08	0.17	0.92	0.58	-	✗
2026 Safenlp 2024	672	SAT	0.60	0.97	0.65	✗	5.56	0.41	0.11	0.08	0.18	0.86	✗	-	✗
2026 Safenlp 2024	673	SAT	0.39	0.98	0.64	3.69	5.47	0.41	0.11	0.26	0.24	0.86	0.59	-	✗
2026 Safenlp 2024	674	SAT	0.66	0.99	0.67	3.63	5.38	0.41	0.11	0.12	0.20	0.84	0.70	-	✗
2026 Safenlp 2024	675	SAT	0.57	0.99	0.65	1.00	5.47	0.41	0.11	0.04	0.17	0.84	✗	-	✗
2026 Safenlp 2024	676	UNSAT	1.00	1.45	1.05	2.20	11.1	1.44	3.53	-	-	-	1.64	-	14.5
2026 Safenlp 2024	677	SAT	0.26	0.98	0.63	0.03	4.25	0.41	0.11	0.09	0.19	0.90	0.48	0.38	✗
2026 Safenlp 2024	678	SAT	0.52	0.98	0.64	2.21	4.32	0.41	0.12	0.08	0.23	0.89	0.80	0.50	✗
2026 Safenlp 2024	679	SAT	0.63	0.98	0.64	0.02	4.25	0.41	0.10	0.22	0.23	0.93	0.78	0.49	✗
2026 Safenlp 2024	680	SAT	0.48	0.98	0.65	3.72	5.64	1.03	0.13	0.09	0.23	0.90	0.58	-	✗
2026 Safenlp 2024	681	SAT	0.58	0.98	0.64	0.04	4.22	0.41	0.10	0.08	0.13	0.89	0.47	0.46	✗
2026 Safenlp 2024	682	UNSAT	0.19	0.73	0.82	2.13	11.0	0.21	0.35	0.29	3.54	0.84	0.51	-	0.03
2026 Safenlp 2024	683	SAT	0.55	0.98	0.62	2.27	5.57	0.41	0.11	0.07	0.12	0.85	0.63	-	✗
2026 Safenlp 2024	684	SAT	0.47	0.98	0.64	3.97	9.71	-	0.12	0.45	0.18	-	-	-	✗
2026 Safenlp 2024	685	SAT	0.68	0.98	0.66	3.65	5.39	0.41	0.11	0.08	0.17	0.83	0.72	-	✗
2026 Safenlp 2024	686	UNSAT	0.94	1.50	1.62	2.20	11.1	1.64	8.51	-	-	-	3.47	-	-
2026 Safenlp 2024	687	SAT	0.70	0.98	0.65	3.94	6.03	7.38	0.10	0.10	0.37	-	1.50	-	✗
2026 Safenlp 2024	688	SAT	0.46	0.99	0.66	✗	5.81	0.41	0.10	0.10	0.57	0.88	0.86	-	✗
2026 Safenlp 2024	689	UNSAT	0.19	0.74	0.82	2.14	10.9	0.82	0.36	0.33	4.01	-	0.56	-	0.06
2026 Safenlp 2024	690	SAT	0.64	0.98	0.66	0.04	4.23	0.41	0.12	0.06	0.43	0.90	0.69	0.43	✗
2026 Safenlp 2024	691	SAT	0.68	0.98	0.64	3.84	6.17	1.23	0.12	0.27	0.28	-	0.65	-	✗
2026 Safenlp 2024	692	SAT	0.58	0.98	0.68	2.17	5.40	0.41	0.11	0.08	0.18	0.83	0.73	-	✗
2026 Safenlp 2024	693	SAT	0.69	0.98	0.66	✗	6.68	-	0.10	-	0.42	-	-	-	✗
2026 Safenlp 2024	694	UNSAT	0.20	0.73	0.75	2.15	10.9	0.21	0.35	0.31	3.97	0.91	0.43	-	0.05
2026 Safenlp 2024	695	SAT	0.58	0.99	0.64	2.36	5.60	0.41	0.13	0.11	0.19	0.87	0.65	-	✗
2026 Safenlp 2024	696	SAT	0.69	0.99	0.60	2.44	6.10	0.41	0.12	0.08	0.16	0.88	0.67	-	✗
2026 Safenlp 2024	697	SAT	0.62	0.97	0.66	0.02	4.25	0.41	0.11	0.08	0.16	0.83	0.46	0.44	✗
2026 Safenlp 2024	698	UNSAT	0.91	1.44	2.43	2.31	11.1	-	15.0	-	-	-	-	-	-
2026 Safenlp 2024	699	SAT	0.54	1.00	0.64	3.76	5.54	0.41	0.12	0.09	0.15	0.90	0.61	-	✗
2026 Safenlp 2024	700	UNSAT	0.18	0.75	0.78	2.12	10.9	0.21	0.35	0.30	3.60	0.86	0.45	-	0.08
2026 Safenlp 2024	701	UNSAT	1.37	1.63	4.89	2.57	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	702	UNSAT	1.28	1.54	2.28	2.44	-	-	11.0	-	-	-	-	-	-
2026 Safenlp 2024	703	SAT	0.69	0.98	0.65	3.91	6.22	-	0.11	-	0.27	-	-	-	✗
2026 Safenlp 2024	704	UNSAT	0.14	0.74	0.82	2.12	10.9	0.21	0.35	0.29	3.57	0.88	0.43	-	-
2026 Safenlp 2024	705	SAT	0.67	0.99	0.64	-	-	-	0.12	-	0.17	-	-	-	✗
2026 Safenlp 2024	706	SAT	0.70	0.98	0.65	0.44	5.39	0.41	0.12	0.23	0.14	0.82	✗	-	✗
2026 Safenlp 2024	707	SAT	0.65	0.99	0.67	3.68	5.44	0.41	0.12	0.12	0.15	0.88	0.65	-	✗
2026 Safenlp 2024	708	SAT	0.66	0.99	0.61	2.26	5.35	0.41	0.10	0.09	0.12	0.82	0.63	-	✗
2026 Safenlp 2024	709	SAT	0.68	0.99	0.62	2.19	5.39	0.41	0.12	0.09	0.14	0.84	0.65	-	✗
2026 Safenlp 2024	710	UNSAT	1.18	1.46	0.94	2.28	11.0	1.44	2.30	-	-	-	0.69	-	4.93
2026 Safenlp 2024	711	UNSAT	1.19	1.60	5.67	3.05	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	712	SAT	0.50	0.98	0.64	3.79	5.40	0.41	0.10	0.08	0.15	0.88	0.96	-	✗
2026 Safenlp 2024	713	UNSAT	1.38	2.01	3.84	2.65	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	714	SAT	0.62	0.99	0.65	0.04	4.21	0.41	0.12	0.07	0.13	0.87	0.67	0.39	✗
2026 Safenlp 2024	715	UNSAT	1.00	1.44	1.39	2.17	11.1	1.64	5.41	-	-	-	1.20	-	15.8
2026 Safenlp 2024	716	SAT	0.56	0.98	0.65	0.02	5.07	0.42	0.11	0.10	0.13	0.85	0.68	0.47	✗
2026 Safenlp 2024	717	SAT	0.49	0.98	0.61	3.65	5.53	0.41	0.12	0.25	0.14	0.90	0.70	-	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	718	UNSAT	1.25	1.50	1.92	2.22	11.1	-	8.60	-	-	-	11.4	-	-
2026 Safenlp 2024	719	SAT	0.61	0.99	0.61	0.07	5.39	0.41	0.12	0.07	0.15	0.87	0.72	-	✗
2026 Safenlp 2024	720	SAT	0.69	0.99	0.64	0.13	5.35	0.41	0.11	0.08	0.14	0.91	0.56	0.51	✗
2026 Safenlp 2024	721	SAT	0.49	0.97	0.63	2.19	5.48	0.21	0.12	0.09	0.15	0.88	0.57	-	✗
2026 Safenlp 2024	722	UNSAT	9.77	9.89	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	723	UNSAT	0.16	0.75	0.82	2.11	10.9	0.21	0.35	0.45	3.56	0.89	0.41	-	-
2026 Safenlp 2024	724	UNSAT	1.19	1.70	14.0	4.61	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	725	UNSAT	1.40	1.96	4.51	2.61	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	726	UNSAT	1.17	1.45	1.18	2.16	11.0	1.64	4.35	-	-	-	1.30	-	-
2026 Safenlp 2024	727	SAT	0.47	0.99	0.65	0.03	4.23	0.41	0.11	0.10	0.12	0.87	0.57	0.44	✗
2026 Safenlp 2024	728	UNSAT	0.85	1.47	2.05	2.20	11.0	1.64	9.73	-	-	-	1.76	-	-
2026 Safenlp 2024	729	SAT	0.70	0.99	0.63	3.65	5.38	1.03	0.12	0.10	0.22	0.87	0.61	-	✗
2026 Safenlp 2024	730	SAT	0.65	0.98	0.65	3.79	5.80	0.41	0.12	0.08	0.14	0.84	0.60	-	✗
2026 Safenlp 2024	731	SAT	0.49	0.95	0.64	2.21	6.59	0.41	0.12	-	0.13	0.89	0.56	-	✗
2026 Safenlp 2024	732	SAT	0.42	0.96	0.72	0.03	4.31	0.41	0.10	0.09	0.15	0.88	0.67	0.45	✗
2026 Safenlp 2024	733	SAT	0.51	0.98	0.64	3.66	5.70	1.03	0.12	0.14	0.14	0.95	0.64	-	✗
2026 Safenlp 2024	734	SAT	0.58	0.96	0.67	0.08	5.40	0.41	0.12	0.07	0.13	0.91	0.63	0.46	✗
2026 Safenlp 2024	735	SAT	0.55	0.98	0.64	0.92	5.39	0.41	0.12	0.08	0.16	0.87	0.66	-	✗
2026 Safenlp 2024	736	UNSAT	0.18	0.75	0.75	2.11	11.0	0.21	0.34	0.48	3.55	0.81	0.48	-	-
2026 Safenlp 2024	737	SAT	0.62	0.99	0.64	0.11	4.27	0.41	0.11	0.21	0.14	0.87	0.64	0.39	✗
2026 Safenlp 2024	738	UNSAT	2.16	2.27	12.9	3.24	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	739	UNSAT	1.26	1.71	14.9	10.6	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	740	UNSAT	0.18	0.74	0.79	2.14	11.0	0.21	0.36	0.30	3.55	0.85	0.42	-	0.05
2026 Safenlp 2024	741	SAT	0.68	0.98	0.67	<0.01	4.27	0.41	0.10	0.08	0.16	0.84	0.59	0.55	✗
2026 Safenlp 2024	742	SAT	0.48	0.95	0.64	✗	5.67	0.41	0.10	0.11	0.13	0.83	0.72	-	✗
2026 Safenlp 2024	743	SAT	0.54	0.97	0.64	0.02	4.31	0.41	0.11	0.06	0.12	0.86	0.69	0.34	✗
2026 Safenlp 2024	744	UNSAT	0.16	0.74	0.79	2.11	11.0	0.21	0.35	0.48	3.57	0.86	0.45	-	0.07
2026 Safenlp 2024	745	UNSAT	6.38	10.5	10.7	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	746	SAT	0.63	0.99	0.63	0.02	4.25	0.41	0.11	0.08	0.12	0.95	0.59	0.50	✗
2026 Safenlp 2024	747	SAT	0.70	0.98	0.63	✗	5.46	0.41	0.11	0.26	0.12	0.89	0.67	-	✗
2026 Safenlp 2024	748	UNSAT	2.32	2.21	8.70	4.00	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	749	SAT	0.44	0.99	0.65	3.70	5.45	0.41	0.11	0.10	0.15	0.88	0.61	-	✗
2026 Safenlp 2024	750	SAT	0.40	0.98	0.65	0.90	5.09	0.41	0.10	0.10	0.12	0.86	0.58	-	✗
2026 Safenlp 2024	751	SAT	0.66	1.00	0.63	0.40	4.27	0.41	0.10	0.07	0.12	0.90	0.65	-	✗
2026 Safenlp 2024	752	SAT	0.63	1.00	0.62	0.06	4.30	0.41	0.10	0.08	0.13	0.85	✗	0.47	✗
2026 Safenlp 2024	753	UNSAT	0.17	0.74	0.77	2.13	10.9	0.21	0.35	0.27	3.61	0.85	0.43	-	0.07
2026 Safenlp 2024	754	SAT	0.66	0.98	0.65	3.89	6.81	-	0.10	0.37	0.15	-	✗	-	✗
2026 Safenlp 2024	755	UNSAT	0.17	0.75	0.79	2.23	10.9	0.21	0.34	0.31	3.58	0.89	1.14	-	0.40
2026 Safenlp 2024	756	SAT	0.61	0.98	0.63	2.27	5.71	0.41	0.12	0.17	0.15	0.85	0.63	-	✗
2026 Safenlp 2024	757	SAT	0.56	0.98	0.64	✗	6.12	0.41	0.12	0.13	0.12	0.89	0.65	-	✗
2026 Safenlp 2024	758	SAT	0.42	0.97	0.64	3.69	5.41	0.41	0.10	0.08	0.16	0.85	0.55	-	✗
2026 Safenlp 2024	759	SAT	0.59	0.98	0.65	0.07	5.34	0.41	0.10	0.06	0.12	0.87	0.66	0.55	✗
2026 Safenlp 2024	760	UNSAT	0.17	0.74	0.83	2.20	10.9	0.82	0.34	0.31	3.54	-	0.57	-	0.08
2026 Safenlp 2024	761	UNSAT	1.43	1.85	5.79	2.66	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	762	UNSAT	1.37	1.79	4.20	2.74	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	763	SAT	0.63	0.96	0.65	0.22	4.22	0.41	0.12	0.21	0.15	0.86	0.65	<0.01	✗
2026 Safenlp 2024	764	SAT	0.56	0.97	0.63	✗	6.31	2.05	0.12	0.15	0.15	-	-	-	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	765	SAT	0.51	0.97	0.65	2.18	5.50	0.41	0.11	0.25	0.13	0.87	0.59	-	✗
2026 Safenlp 2024	766	SAT	0.65	0.98	0.68	✗	5.53	0.41	0.10	0.07	0.11	0.87	0.56	-	✗
2026 Safenlp 2024	767	SAT	0.68	0.98	0.64	3.67	5.37	0.41	0.12	0.09	0.12	0.86	0.61	-	✗
2026 Safenlp 2024	768	SAT	0.49	1.00	0.64	0.02	4.28	0.41	0.10	0.11	0.12	0.89	0.64	0.53	✗
2026 Safenlp 2024	769	SAT	0.66	0.97	0.64	0.48	5.37	0.41	0.10	0.08	0.13	0.91	0.68	-	✗
2026 Safenlp 2024	770	UNSAT	0.96	1.50	3.72	2.49	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	771	UNSAT	0.20	0.73	0.78	2.24	10.9	0.21	0.37	0.47	3.54	0.86	0.49	-	-
2026 Safenlp 2024	772	UNSAT	0.87	1.44	0.97	2.28	11.0	0.82	3.67	-	-	-	0.96	-	8.16
2026 Safenlp 2024	773	UNSAT	1.17	1.43	2.64	2.31	11.1	-	10.6	-	-	-	7.85	-	-
2026 Safenlp 2024	774	SAT	0.64	0.97	0.71	0.06	4.98	0.41	0.12	0.10	0.11	0.91	0.66	0.51	✗
2026 Safenlp 2024	775	SAT	0.67	0.99	0.70	3.67	5.38	0.41	0.11	0.09	0.15	0.89	0.72	-	✗
2026 Safenlp 2024	776	UNSAT	0.17	0.74	0.80	2.13	10.8	0.21	0.35	0.31	3.54	0.85	0.50	-	-
2026 Safenlp 2024	777	SAT	0.54	1.00	0.67	3.76	5.77	0.41	0.11	0.26	0.13	0.87	0.58	-	✗
2026 Safenlp 2024	778	SAT	0.44	0.99	0.66	3.75	5.78	0.21	0.12	0.09	0.12	0.90	0.55	-	✗
2026 Safenlp 2024	779	SAT	0.50	0.99	0.63	1.00	5.43	0.41	0.10	0.24	0.12	0.87	0.56	-	✗
2026 Safenlp 2024	780	SAT	0.56	0.98	0.67	3.75	5.34	0.41	0.12	0.09	0.13	0.83	✗	-	✗
2026 Safenlp 2024	781	SAT	0.48	0.98	0.68	3.71	5.72	0.41	0.11	0.08	0.15	0.90	0.63	-	✗
2026 Safenlp 2024	782	SAT	0.74	0.98	0.65	3.76	5.82	-	0.11	-	0.40	-	1.92	-	✗
2026 Safenlp 2024	783	SAT	0.62	0.98	0.64	3.63	5.63	0.41	0.09	0.15	0.14	0.87	0.58	-	✗
2026 Safenlp 2024	784	SAT	0.62	0.98	0.63	0.05	5.46	0.41	0.10	0.08	0.13	0.83	0.69	0.46	✗
2026 Safenlp 2024	785	UNSAT	0.20	0.72	0.80	2.15	10.9	0.21	0.34	0.31	3.53	0.85	0.45	-	0.06
2026 Safenlp 2024	786	UNSAT	2.57	2.88	6.70	8.01	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	787	SAT	0.54	1.00	0.68	3.65	5.62	0.41	0.11	0.11	0.13	0.84	0.69	-	✗
2026 Safenlp 2024	788	SAT	0.66	0.98	0.65	2.27	5.33	0.41	0.12	0.09	0.11	0.83	0.71	-	✗
2026 Safenlp 2024	789	SAT	0.43	0.99	0.66	3.67	5.70	0.41	0.11	0.14	0.14	0.90	✗	-	✗
2026 Safenlp 2024	790	UNSAT	1.05	1.44	1.76	2.25	11.0	3.08	6.18	-	-	-	5.22	-	-
2026 Safenlp 2024	791	SAT	0.58	0.97	0.64	3.99	6.05	1.03	0.11	0.16	0.13	-	0.67	-	✗
2026 Safenlp 2024	792	UNSAT	1.11	1.51	2.30	2.29	11.0	18.9	9.94	-	-	-	-	-	-
2026 Safenlp 2024	793	SAT	0.62	0.99	0.63	0.07	4.31	0.41	0.11	0.07	0.13	0.87	0.68	0.63	✗
2026 Safenlp 2024	794	SAT	0.54	1.00	0.61	0.84	5.46	0.41	0.11	0.09	0.12	0.88	0.63	-	✗
2026 Safenlp 2024	795	SAT	0.70	0.99	0.67	✗	5.44	0.41	0.10	0.25	0.12	0.93	0.63	-	✗
2026 Safenlp 2024	796	SAT	0.45	1.00	0.66	4.84	6.66	2.05	0.10	0.14	0.15	-	-	-	✗
2026 Safenlp 2024	797	UNSAT	0.89	1.46	1.97	2.17	11.0	3.08	10.0	-	-	-	6.71	-	-
2026 Safenlp 2024	798	UNSAT	1.18	1.45	1.55	2.19	11.0	2.26	5.43	-	-	-	3.68	-	16.5
2026 Safenlp 2024	799	UNSAT	1.96	2.33	3.34	3.18	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	800	SAT	0.65	0.99	0.66	2.27	5.39	0.41	0.10	0.07	0.12	0.92	✗	-	✗
2026 Safenlp 2024	801	SAT	0.41	0.98	0.66	✗	5.46	0.41	0.10	0.24	0.15	0.88	0.66	-	✗
2026 Safenlp 2024	802	SAT	0.62	0.98	0.66	0.06	4.96	0.41	0.13	0.07	0.10	0.86	0.65	0.40	✗
2026 Safenlp 2024	803	SAT	0.49	0.98	0.62	2.21	5.34	0.41	0.11	0.09	0.11	0.87	0.65	-	✗
2026 Safenlp 2024	804	SAT	0.34	0.97	0.64	0.03	4.31	0.41	0.10	0.09	0.11	0.81	0.45	0.48	✗
2026 Safenlp 2024	805	UNSAT	0.15	0.74	0.79	2.23	11.0	1.44	0.36	0.32	3.54	-	0.51	-	0.05
2026 Safenlp 2024	806	SAT	0.49	0.97	0.64	✗	5.76	0.41	0.11	0.25	0.12	0.87	0.59	-	✗
2026 Safenlp 2024	807	UNSAT	1.00	1.56	3.03	2.38	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	808	SAT	0.71	0.98	0.66	✗	5.59	0.41	0.11	0.09	0.15	0.91	0.67	-	✗
2026 Safenlp 2024	809	SAT	0.58	0.98	0.65	3.71	5.57	0.21	0.10	0.08	0.16	0.87	✗	-	✗
2026 Safenlp 2024	810	SAT	0.45	0.97	0.70	3.84	5.76	1.23	0.12	0.19	0.21	0.93	1.00	-	✗
2026 Safenlp 2024	811	UNSAT	0.15	0.73	0.79	2.13	11.0	0.21	0.36	0.31	3.54	0.89	0.49	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	812	SAT	0.47	0.99	0.65	3.71	5.49	0.41	0.12	0.24	0.13	0.89	0.62	-	✗
2026 Safenlp 2024	813	SAT	0.39	0.98	0.64	2.50	6.06	0.41	0.11	0.10	0.18	0.88	0.58	-	✗
2026 Safenlp 2024	814	UNSAT	0.87	1.44	0.99	2.17	10.9	0.82	2.98	-	-	-	0.60	-	4.99
2026 Safenlp 2024	815	SAT	0.37	0.99	0.65	0.03	4.23	0.41	0.11	0.05	0.12	0.84	0.44	0.42	✗
2026 Safenlp 2024	816	SAT	0.64	0.97	0.62	2.30	5.86	0.41	0.12	0.10	0.14	0.85	0.64	-	✗
2026 Safenlp 2024	817	SAT	0.57	0.98	0.63	3.65	5.02	0.42	0.12	0.08	0.15	0.86	0.63	-	✗
2026 Safenlp 2024	818	SAT	0.51	0.97	0.67	2.18	5.32	0.41	0.12	0.08	0.14	0.87	0.56	-	✗
2026 Safenlp 2024	819	SAT	0.65	0.98	0.64	3.66	5.46	1.64	0.16	0.12	0.13	0.92	1.00	-	✗
2026 Safenlp 2024	820	UNSAT	0.97	1.50	3.26	2.38	-	-	14.3	-	-	-	-	-	-
2026 Safenlp 2024	821	SAT	0.41	0.99	0.61	✗	5.50	0.41	0.12	0.08	0.14	0.89	0.62	-	✗
2026 Safenlp 2024	822	SAT	0.48	0.98	0.64	2.15	4.25	0.41	0.12	0.25	0.15	0.86	0.71	-	✗
2026 Safenlp 2024	823	SAT	0.67	1.01	0.63	2.17	5.41	0.41	0.09	0.08	0.12	0.87	✗	-	✗
2026 Safenlp 2024	824	SAT	0.70	0.98	0.66	2.26	5.48	0.41	0.11	0.09	0.13	0.89	0.68	-	✗
2026 Safenlp 2024	825	UNSAT	0.14	0.72	0.79	2.14	10.9	0.21	0.36	0.29	3.57	0.88	0.44	-	0.05
2026 Safenlp 2024	826	SAT	0.50	0.97	0.70	0.03	5.39	0.41	0.10	0.06	0.16	0.82	0.61	0.50	✗
2026 Safenlp 2024	827	SAT	0.49	0.97	0.64	0.13	4.25	0.41	0.11	0.23	0.14	0.90	0.74	0.48	✗
2026 Safenlp 2024	828	SAT	0.51	0.98	0.70	3.68	5.28	0.41	0.09	0.07	0.12	0.88	0.61	-	✗
2026 Safenlp 2024	829	UNSAT	0.19	0.72	0.78	2.12	10.8	0.21	0.35	0.31	3.54	0.85	0.43	-	0.13
2026 Safenlp 2024	830	UNSAT	1.07	1.60	4.12	2.50	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	831	SAT	0.37	0.99	0.63	✗	5.41	0.41	0.10	0.25	0.12	0.86	0.78	-	✗
2026 Safenlp 2024	832	UNSAT	0.18	0.74	0.78	2.13	11.0	0.21	0.35	0.31	3.53	0.85	1.20	-	0.10
2026 Safenlp 2024	833	UNSAT	1.01	1.61	3.79	2.45	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	834	UNSAT	1.75	2.12	4.87	3.13	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	835	SAT	0.66	0.99	0.63	3.64	5.32	0.41	0.12	0.25	0.12	0.85	0.65	-	✗
2026 Safenlp 2024	836	UNSAT	0.19	0.74	0.79	2.22	10.9	0.21	0.36	0.44	3.54	0.83	0.48	-	0.05
2026 Safenlp 2024	837	SAT	0.33	0.99	0.64	0.21	5.42	0.42	0.10	0.22	0.12	0.87	0.56	0.55	✗
2026 Safenlp 2024	838	SAT	0.51	0.98	0.63	0.07	4.23	0.41	0.11	0.06	0.12	0.84	0.99	0.45	✗
2026 Safenlp 2024	839	SAT	0.55	0.98	0.66	2.27	7.70	-	0.10	0.08	0.13	-	1.73	-	✗
2026 Safenlp 2024	840	UNSAT	1.14	1.47	1.40	2.20	11.0	3.28	7.90	-	-	-	9.68	-	-
2026 Safenlp 2024	841	SAT	0.41	1.00	0.62	0.10	5.40	0.41	0.09	0.07	0.15	0.89	0.57	0.35	✗
2026 Safenlp 2024	842	SAT	0.68	0.99	0.64	2.19	5.69	0.41	0.12	0.16	0.10	0.83	0.63	-	✗
2026 Safenlp 2024	843	SAT	0.65	0.97	0.63	0.01	4.25	0.41	0.11	0.06	0.11	0.89	0.64	0.42	✗
2026 Safenlp 2024	844	SAT	0.70	0.98	0.67	2.17	5.51	0.41	0.12	0.06	0.12	0.81	✗	-	✗
2026 Safenlp 2024	845	SAT	0.50	0.98	0.67	✗	5.64	0.41	0.12	0.10	0.13	0.85	0.64	-	✗
2026 Safenlp 2024	846	UNSAT	0.87	1.44	1.14	2.20	10.9	1.85	4.86	-	-	-	2.00	-	14.5
2026 Safenlp 2024	847	UNSAT	0.17	0.74	0.73	2.14	11.0	0.21	0.37	0.31	3.52	0.92	0.41	-	0.04
2026 Safenlp 2024	848	UNSAT	3.09	4.04	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	849	UNSAT	0.16	0.75	0.77	2.26	11.0	0.21	0.37	0.30	3.56	0.93	0.46	-	-
2026 Safenlp 2024	850	UNSAT	0.18	0.75	0.79	2.21	10.9	0.21	0.36	0.46	3.54	0.83	0.49	-	0.04
2026 Safenlp 2024	851	SAT	0.35	0.99	0.62	2.28	5.49	0.41	0.11	0.08	0.12	0.89	0.68	-	✗
2026 Safenlp 2024	852	SAT	0.39	0.96	0.67	3.77	5.58	0.41	0.12	0.25	0.17	0.86	0.55	-	✗
2026 Safenlp 2024	853	UNSAT	1.04	1.43	1.04	2.27	11.1	1.44	3.55	-	-	-	1.05	-	8.05
2026 Safenlp 2024	854	SAT	0.66	0.98	0.65	2.41	6.16	1.03	0.11	0.10	0.12	-	✗	-	✗
2026 Safenlp 2024	855	UNSAT	2.03	2.18	16.7	3.92	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	856	SAT	0.68	0.98	0.67	2.29	5.40	0.41	0.11	0.07	0.13	0.86	0.65	-	✗
2026 Safenlp 2024	857	SAT	0.67	0.98	0.66	3.73	5.46	0.41	0.12	0.09	0.12	0.92	0.66	-	✗
2026 Safenlp 2024	858	UNSAT	1.41	1.85	-	3.96	-	-	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	859	SAT	0.66	0.98	0.71	0.03	5.39	0.41	0.11	0.22	0.14	0.84	0.70	0.55	✗
2026 Safenlp 2024	860	UNSAT	0.18	0.74	0.78	2.24	10.9	0.21	0.36	0.35	3.54	0.86	0.47	-	0.10
2026 Safenlp 2024	861	SAT	0.46	0.96	0.67	0.02	4.96	0.41	0.12	0.05	0.12	0.86	0.69	0.57	✗
2026 Safenlp 2024	862	SAT	0.62	1.00	0.62	0.37	5.36	0.41	0.12	0.07	0.14	0.89	✗	0.46	✗
2026 Safenlp 2024	863	SAT	0.69	1.00	0.64	1.00	5.20	0.41	0.12	0.09	0.13	0.84	0.63	-	✗
2026 Safenlp 2024	864	SAT	0.47	0.98	0.65	1.14	5.39	0.41	0.13	0.09	0.12	0.83	0.64	-	✗
2026 Safenlp 2024	865	SAT	0.66	1.00	0.66	✗	5.47	0.41	0.12	0.06	0.13	0.82	0.64	-	✗
2026 Safenlp 2024	866	UNSAT	1.02	1.53	2.24	2.42	11.0	5.95	9.77	-	-	-	7.53	-	-
2026 Safenlp 2024	867	SAT	0.68	0.99	0.62	3.70	5.53	0.41	0.12	0.08	0.15	0.83	0.93	-	✗
2026 Safenlp 2024	868	SAT	0.70	0.98	0.64	2.22	5.72	0.41	0.11	0.18	0.14	0.87	0.69	-	✗
2026 Safenlp 2024	869	UNSAT	0.20	0.73	0.77	2.23	10.9	0.21	0.35	0.27	3.53	0.87	0.49	-	-
2026 Safenlp 2024	870	SAT	0.63	0.98	0.66	0.04	4.31	0.41	0.11	0.06	0.13	0.84	0.50	0.35	✗
2026 Safenlp 2024	871	SAT	0.65	0.96	0.67	1.41	5.43	0.41	0.12	0.22	0.11	0.85	0.71	0.57	✗
2026 Safenlp 2024	872	UNSAT	1.03	1.47	1.94	2.27	11.0	2.46	8.55	-	-	-	6.14	-	-
2026 Safenlp 2024	873	UNSAT	0.16	0.73	0.83	2.21	10.8	0.21	0.35	0.30	3.55	0.88	0.43	-	0.07
2026 Safenlp 2024	874	UNSAT	0.16	0.74	0.77	2.13	11.1	0.21	0.36	0.30	3.66	0.86	0.43	-	-
2026 Safenlp 2024	875	SAT	0.67	0.98	0.66	✗	5.54	0.41	0.11	0.10	0.16	0.88	0.60	-	✗
2026 Safenlp 2024	876	UNSAT	0.21	0.73	0.76	2.25	11.0	0.21	0.37	0.28	3.55	0.84	0.48	-	0.08
2026 Safenlp 2024	877	UNSAT	2.17	2.91	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	878	UNSAT	0.15	0.75	0.85	2.20	10.9	0.21	0.34	0.44	3.55	0.87	1.20	-	0.09
2026 Safenlp 2024	879	SAT	0.59	0.98	0.63	3.67	5.48	0.41	0.10	0.08	0.11	0.85	1.38	-	✗
2026 Safenlp 2024	880	SAT	0.49	0.97	0.65	2.29	5.63	0.41	0.11	0.10	0.14	0.85	0.57	-	✗
2026 Safenlp 2024	881	SAT	0.62	0.99	0.59	0.06	4.27	0.41	0.11	0.10	0.12	0.84	0.56	0.40	✗
2026 Safenlp 2024	882	SAT	0.50	1.01	0.59	2.29	5.47	0.41	0.12	0.09	0.11	0.85	0.66	-	✗
2026 Safenlp 2024	883	SAT	0.68	0.98	0.68	2.16	5.53	0.41	0.10	0.11	0.13	0.88	0.62	-	✗
2026 Safenlp 2024	884	SAT	0.48	0.96	0.63	2.29	6.83	2.05	0.10	0.11	0.14	-	-	-	✗
2026 Safenlp 2024	885	UNSAT	2.58	3.98	-	14.9	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	886	UNSAT	1.17	1.45	1.37	2.20	11.0	3.07	4.83	-	-	-	3.17	-	15.1
2026 Safenlp 2024	887	SAT	0.54	0.99	0.66	0.03	4.96	0.41	0.11	0.06	0.11	0.88	0.51	0.40	✗
2026 Safenlp 2024	888	SAT	0.66	0.98	0.67	3.99	6.68	1.44	0.11	-	0.12	-	-	-	✗
2026 Safenlp 2024	889	SAT	0.63	0.96	0.64	0.03	4.20	0.41	0.11	0.05	0.13	0.88	0.76	0.46	✗
2026 Safenlp 2024	890	UNSAT	0.15	0.74	0.79	2.23	10.9	0.21	0.36	0.33	3.60	0.84	0.50	-	-
2026 Safenlp 2024	891	SAT	0.68	0.98	0.66	3.74	5.65	0.41	0.12	0.09	0.14	0.85	0.64	-	✗
2026 Safenlp 2024	892	SAT	0.62	0.98	0.65	2.18	4.24	0.41	0.12	0.08	0.15	0.88	0.72	-	✗
2026 Safenlp 2024	893	UNSAT	1.01	1.44	2.29	2.31	11.1	-	13.5	-	-	-	-	-	-
2026 Safenlp 2024	894	UNSAT	0.18	0.74	0.79	2.17	11.0	0.21	0.35	0.33	3.53	0.88	0.43	-	0.07
2026 Safenlp 2024	895	SAT	0.50	1.00	0.67	-	-	-	0.11	-	0.40	-	-	-	✗
2026 Safenlp 2024	896	SAT	0.47	0.98	0.65	0.10	5.44	0.41	0.09	0.09	0.52	0.92	0.72	0.49	✗
2026 Safenlp 2024	897	SAT	0.62	0.99	0.66	3.66	5.70	0.21	0.12	0.12	0.78	0.84	0.67	-	✗
2026 Safenlp 2024	898	UNSAT	1.04	1.59	6.24	2.40	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	899	SAT	0.66	0.98	0.70	0.02	4.20	0.41	0.10	0.11	0.12	0.84	0.72	0.53	✗
2026 Safenlp 2024	900	UNSAT	0.94	1.38	1.06	2.19	11.0	1.44	4.85	-	-	-	1.41	-	7.95
2026 Safenlp 2024	901	SAT	0.53	0.97	0.68	2.34	5.74	18.3	0.11	0.18	0.14	-	-	-	✗
2026 Safenlp 2024	902	UNSAT	1.12	1.42	0.94	2.26	11.0	1.65	4.20	-	-	-	1.64	-	5.93
2026 Safenlp 2024	903	UNSAT	0.17	0.73	0.78	2.13	10.9	0.21	0.35	0.46	3.53	0.85	0.45	-	0.09
2026 Safenlp 2024	904	SAT	0.64	1.00	0.63	0.03	5.32	0.41	0.12	0.20	0.13	0.88	0.63	0.48	✗
2026 Safenlp 2024	905	UNSAT	1.14	1.51	5.71	2.46	-	-	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	906	SAT	0.66	0.99	0.64	2.34	6.25	1.03	0.11	0.15	0.13	-	1.69	-	✗
2026 Safenlp 2024	907	SAT	0.65	0.99	0.65	3.65	5.47	0.41	0.12	0.13	0.13	0.85	0.67	-	✗
2026 Safenlp 2024	908	SAT	0.37	0.98	0.71	0.03	4.20	0.41	0.11	0.19	0.12	0.88	0.76	0.40	✗
2026 Safenlp 2024	909	SAT	0.47	0.98	0.66	✗	5.36	0.41	0.12	0.23	0.13	0.84	0.60	-	✗
2026 Safenlp 2024	910	SAT	0.66	0.97	0.65	3.78	5.42	1.23	0.13	0.09	0.14	0.88	0.67	-	✗
2026 Safenlp 2024	911	UNSAT	1.50	2.13	8.70	3.26	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	912	UNSAT	0.17	0.75	0.84	2.14	10.9	0.21	0.36	0.30	3.54	0.88	0.54	-	0.03
2026 Safenlp 2024	913	UNSAT	1.31	1.60	10.6	3.11	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	914	UNSAT	1.20	1.45	0.93	2.16	10.9	0.82	2.24	-	-	-	0.80	-	5.05
2026 Safenlp 2024	915	SAT	0.59	0.97	0.64	2.28	5.53	0.41	0.13	0.12	0.15	0.89	0.57	-	✗
2026 Safenlp 2024	916	UNSAT	0.18	0.74	0.78	2.12	10.9	0.21	0.36	0.31	3.52	0.88	0.49	-	-
2026 Safenlp 2024	917	UNSAT	0.20	0.77	0.80	2.26	11.0	0.21	0.34	0.31	3.56	0.85	0.49	-	-
2026 Safenlp 2024	918	SAT	0.45	1.00	0.63	2.23	5.66	1.23	0.09	0.27	0.13	-	0.64	-	✗
2026 Safenlp 2024	919	SAT	0.62	0.99	0.68	0.10	4.24	0.41	0.13	0.07	0.13	0.87	0.75	0.46	✗
2026 Safenlp 2024	920	SAT	0.68	0.98	0.62	✗	5.32	1.23	0.11	0.09	0.13	0.93	0.71	-	✗
2026 Safenlp 2024	921	SAT	0.62	0.96	0.71	✗	5.64	0.41	0.12	0.13	0.15	0.85	0.57	-	✗
2026 Safenlp 2024	922	SAT	0.34	0.97	0.67	2.17	5.46	0.41	0.12	0.08	0.13	0.86	0.67	-	✗
2026 Safenlp 2024	923	UNSAT	0.89	1.44	1.55	2.25	11.1	2.05	7.13	-	-	-	16.5	-	-
2026 Safenlp 2024	924	SAT	0.63	1.00	0.66	0.09	5.49	0.41	0.12	0.23	0.12	0.86	0.77	-	✗
2026 Safenlp 2024	925	UNSAT	0.17	0.74	0.87	2.16	11.1	0.82	0.35	0.33	3.56	-	0.75	-	0.06
2026 Safenlp 2024	926	SAT	0.43	0.98	0.68	0.15	4.95	0.41	0.12	0.08	0.14	0.89	0.61	0.54	✗
2026 Safenlp 2024	927	SAT	0.66	0.99	0.69	2.27	5.46	0.41	0.09	0.09	0.12	0.89	0.70	-	✗
2026 Safenlp 2024	928	UNSAT	0.16	0.75	0.78	2.16	10.9	0.21	0.35	0.29	3.55	0.82	0.50	-	0.07
2026 Safenlp 2024	929	SAT	0.71	0.98	0.67	2.26	5.56	0.41	0.11	0.09	0.14	0.92	0.64	-	✗
2026 Safenlp 2024	930	UNSAT	0.94	1.46	1.07	2.22	11.0	2.05	4.36	-	-	-	2.20	-	12.7
2026 Safenlp 2024	931	SAT	0.42	0.99	0.66	3.71	5.67	0.41	0.10	0.24	0.14	0.86	0.73	-	✗
2026 Safenlp 2024	932	UNSAT	1.42	1.62	4.10	2.54	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	933	UNSAT	0.16	0.75	0.83	2.14	10.9	0.21	0.37	0.30	3.56	0.88	0.41	-	-
2026 Safenlp 2024	934	UNSAT	0.18	0.75	0.80	2.13	10.9	0.82	0.34	0.32	3.57	-	0.55	-	0.06
2026 Safenlp 2024	935	SAT	0.70	0.97	0.69	2.25	5.38	1.03	0.10	0.08	0.13	0.95	0.72	-	✗
2026 Safenlp 2024	936	SAT	0.50	0.97	0.65	2.33	5.58	1.23	0.11	0.07	0.14	0.87	0.70	-	✗
2026 Safenlp 2024	937	UNSAT	7.62	8.10	15.4	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	938	UNSAT	1.66	2.13	-	16.7	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	939	UNSAT	0.15	0.73	0.83	2.12	10.9	0.82	0.37	0.31	3.53	-	0.55	-	0.09
2026 Safenlp 2024	940	SAT	0.42	0.97	0.62	2.40	6.86	-	0.12	0.14	0.13	-	-	-	✗
2026 Safenlp 2024	941	UNSAT	0.18	0.73	0.79	2.16	11.0	0.21	0.34	0.27	3.54	0.85	0.48	-	-
2026 Safenlp 2024	942	UNSAT	0.99	1.45	1.00	2.19	11.0	1.23	3.01	-	-	-	1.06	-	6.37
2026 Safenlp 2024	943	UNSAT	1.13	1.49	2.29	2.21	11.1	3.49	11.8	-	-	-	-	-	-
2026 Safenlp 2024	944	UNSAT	1.08	1.54	3.30	2.53	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	945	UNSAT	1.10	1.54	5.16	2.46	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	946	SAT	0.52	0.98	0.70	✗	5.58	0.41	0.11	0.08	0.13	0.85	0.66	-	✗
2026 Safenlp 2024	947	SAT	0.63	1.00	0.68	✗	5.45	0.41	0.12	0.07	0.13	0.87	0.64	-	✗
2026 Safenlp 2024	948	UNSAT	0.17	0.74	0.79	2.14	11.0	0.21	0.36	0.31	3.54	0.88	0.43	-	0.09
2026 Safenlp 2024	949	SAT	0.61	0.96	0.69	0.04	4.30	0.41	0.11	0.07	0.12	0.89	0.69	0.46	✗
2026 Safenlp 2024	950	SAT	0.67	0.98	0.66	✗	5.65	1.23	0.12	0.11	0.13	1.06	0.70	-	✗
2026 Safenlp 2024	951	SAT	0.62	0.97	0.69	0.05	4.31	0.41	0.11	0.08	0.12	0.90	0.66	0.45	✗
2026 Safenlp 2024	952	SAT	0.52	0.98	0.70	✗	6.60	1.03	0.11	0.28	0.13	0.92	0.85	-	✗

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	953	SAT	0.39	0.97	0.64	0.13	5.35	0.41	0.11	0.22	0.14	0.85	0.69	0.54	✗
2026 Safenlp 2024	954	SAT	0.35	0.96	0.70	2.28	5.79	0.41	0.11	0.08	0.14	0.84	1.48	-	✗
2026 Safenlp 2024	955	SAT	0.50	0.98	0.66	✗	5.72	0.41	0.11	0.37	0.13	0.90	1.42	-	✗
2026 Safenlp 2024	956	SAT	0.60	0.97	0.65	0.04	4.96	0.41	0.11	0.06	0.11	0.88	✗	0.48	✗
2026 Safenlp 2024	957	UNSAT	1.42	1.83	4.74	2.76	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	958	SAT	0.65	0.97	0.67	2.18	5.75	1.23	0.12	0.21	0.19	-	0.97	-	✗
2026 Safenlp 2024	959	SAT	0.47	0.97	0.68	0.03	4.22	0.41	0.11	0.04	0.12	0.88	0.57	0.44	✗
2026 Safenlp 2024	960	SAT	0.65	0.99	0.66	3.70	5.64	0.41	0.12	0.08	0.14	0.86	0.76	-	✗
2026 Safenlp 2024	961	SAT	0.64	0.97	0.68	0.03	4.21	0.41	0.12	0.07	0.18	0.82	0.49	0.33	✗
2026 Safenlp 2024	962	SAT	0.55	0.97	0.66	0.56	4.24	0.41	0.12	0.07	0.11	0.85	0.65	-	✗
2026 Safenlp 2024	963	SAT	0.58	0.96	0.71	3.64	5.36	0.41	0.12	0.10	0.12	0.91	0.61	-	✗
2026 Safenlp 2024	964	UNSAT	0.15	0.74	0.79	2.24	11.0	0.21	0.34	0.30	3.57	0.88	0.49	-	0.06
2026 Safenlp 2024	965	UNSAT	1.51	1.90	6.98	5.06	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	966	UNSAT	1.10	1.54	3.75	2.41	-	-	16.7	-	-	-	-	-	-
2026 Safenlp 2024	967	UNSAT	0.18	0.72	0.79	2.22	10.9	0.21	0.37	0.31	3.54	0.90	0.42	-	0.06
2026 Safenlp 2024	968	UNSAT	1.88	2.22	18.6	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	969	SAT	0.66	0.99	0.68	4.43	6.82	-	0.10	0.17	0.13	-	1.93	-	✗
2026 Safenlp 2024	970	UNSAT	1.44	1.71	10.5	3.99	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	971	UNSAT	3.20	3.98	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	972	SAT	0.65	0.98	0.71	2.32	6.01	0.41	0.12	0.07	0.13	0.86	1.62	-	✗
2026 Safenlp 2024	973	UNSAT	0.96	1.51	2.57	2.35	11.4	3.28	14.1	-	-	-	-	-	-
2026 Safenlp 2024	974	SAT	0.59	0.98	0.64	2.22	5.59	0.41	0.12	0.08	0.15	0.84	0.62	-	✗
2026 Safenlp 2024	975	UNSAT	1.23	1.50	3.00	2.38	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	976	UNSAT	1.60	1.91	5.51	2.96	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	977	SAT	0.55	0.99	0.72	3.67	5.47	1.23	0.11	0.10	0.14	1.31	0.66	-	✗
2026 Safenlp 2024	978	SAT	0.64	0.98	0.70	3.67	5.55	0.41	0.12	0.08	0.13	0.87	0.71	-	✗
2026 Safenlp 2024	979	UNSAT	0.18	0.73	0.84	2.23	11.0	0.21	0.36	0.46	3.54	0.86	0.49	-	0.10
2026 Safenlp 2024	980	UNSAT	0.16	0.74	0.79	2.15	10.8	0.21	0.36	0.32	3.57	0.85	0.47	-	0.06
2026 Safenlp 2024	981	SAT	0.73	0.98	0.70	3.74	5.52	0.41	0.12	0.09	0.16	0.83	0.60	-	✗
2026 Safenlp 2024	982	UNSAT	6.28	7.18	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	983	SAT	0.65	1.00	0.73	2.25	4.19	0.41	0.11	0.09	0.13	0.92	0.64	-	✗
2026 Safenlp 2024	984	UNSAT	0.16	0.75	0.85	2.12	10.9	0.21	0.36	0.49	3.56	0.84	0.44	-	0.07
2026 Safenlp 2024	985	SAT	0.39	0.99	0.72	2.27	5.64	2.05	0.12	0.09	0.14	-	1.02	-	✗
2026 Safenlp 2024	986	SAT	0.66	0.97	0.68	0.11	5.43	0.41	0.11	0.10	0.14	0.84	0.71	0.53	✗
2026 Safenlp 2024	987	UNSAT	0.90	1.44	1.09	2.20	11.0	3.90	4.29	-	-	-	1.43	-	12.6
2026 Safenlp 2024	988	SAT	0.46	0.97	0.66	3.77	5.44	0.41	0.11	0.12	0.13	0.85	0.64	-	✗
2026 Safenlp 2024	989	UNSAT	1.11	1.48	5.10	2.35	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	990	UNSAT	8.31	9.05	8.97	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	991	UNSAT	0.17	0.74	0.81	2.12	11.1	0.21	0.36	0.29	3.58	0.88	1.23	-	-
2026 Safenlp 2024	992	SAT	0.54	1.01	0.68	2.31	5.49	0.41	0.13	0.09	0.13	0.91	0.64	-	✗
2026 Safenlp 2024	993	SAT	0.47	1.02	0.69	0.02	4.25	0.41	0.10	0.07	0.12	0.88	0.69	0.50	✗
2026 Safenlp 2024	994	SAT	0.67	0.98	0.68	1.96	5.33	0.41	0.13	0.08	0.14	0.87	0.63	0.40	✗
2026 Safenlp 2024	995	UNSAT	1.06	1.45	0.99	2.20	10.9	1.03	2.32	-	-	-	0.95	-	5.89
2026 Safenlp 2024	996	UNSAT	2.09	3.07	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	997	SAT	0.43	0.98	0.67	0.17	4.26	0.41	0.11	0.04	0.14	0.87	0.59	0.47	✗
2026 Safenlp 2024	998	UNSAT	1.32	1.59	4.03	2.52	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	999	UNSAT	1.45	1.74	5.73	2.55	-	-	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	1000	SAT	0.68	0.97	0.69	2.19	5.62	0.41	0.13	0.08	0.11	0.87	0.66	-	✗
2026 Safenlp 2024	1001	SAT	0.65	0.95	0.66	3.83	5.67	0.41	0.10	0.05	0.13	0.84	0.69	-	✗
2026 Safenlp 2024	1002	UNSAT	0.17	0.74	0.84	2.27	10.9	0.21	0.37	0.46	3.56	0.87	0.48	-	-
2026 Safenlp 2024	1003	SAT	0.51	0.97	-	2.85	-	-	-	-	0.17	-	-	-	✗
2026 Safenlp 2024	1004	SAT	0.43	0.97	0.65	0.03	5.45	0.41	0.11	0.11	0.12	0.87	0.95	0.46	✗
2026 Safenlp 2024	1005	UNSAT	2.01	3.02	-	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	1006	SAT	0.59	0.98	0.63	0.05	4.24	0.41	0.13	0.24	0.14	0.93	0.68	0.42	✗
2026 Safenlp 2024	1007	SAT	0.57	0.97	0.70	2.27	4.20	0.41	0.12	0.09	0.11	0.86	✗	-	✗
2026 Safenlp 2024	1008	UNSAT	0.98	1.44	1.05	2.28	11.0	0.82	4.15	-	-	-	0.63	-	5.25
2026 Safenlp 2024	1009	UNSAT	0.16	0.75	0.82	2.23	10.9	0.21	0.39	0.31	3.57	0.85	0.48	-	0.08
2026 Safenlp 2024	1010	SAT	0.63	0.98	0.70	3.77	5.57	1.23	0.13	0.26	0.12	1.25	0.66	-	✗
2026 Safenlp 2024	1011	SAT	0.68	0.97	0.67	✗	-	1.23	0.12	-	0.14	-	0.85	-	✗
2026 Safenlp 2024	1012	SAT	0.65	0.99	0.69	✗	5.38	0.41	0.11	0.09	0.15	0.84	1.49	-	✗
2026 Safenlp 2024	1013	UNSAT	2.44	2.83	-	11.1	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	1014	UNSAT	1.02	1.45	1.41	2.18	11.0	1.85	6.70	-	-	-	2.16	-	16.2
2026 Safenlp 2024	1015	SAT	0.55	0.97	0.66	1.91	5.43	0.41	0.12	0.08	0.12	0.88	0.68	-	✗
2026 Safenlp 2024	1016	UNSAT	1.39	1.91	8.89	2.69	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	1017	SAT	0.49	0.99	0.66	3.64	5.73	0.41	0.13	0.32	0.14	0.88	0.63	-	✗
2026 Safenlp 2024	1018	SAT	0.61	0.98	0.69	0.02	4.24	0.41	0.11	0.24	0.09	0.84	0.80	0.44	✗
2026 Safenlp 2024	1019	UNSAT	0.18	0.73	0.82	2.13	10.9	0.21	0.37	0.30	3.54	0.93	0.49	-	0.07
2026 Safenlp 2024	1020	UNSAT	1.26	1.54	2.99	2.42	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	1021	UNSAT	0.18	0.74	0.78	2.16	10.9	0.21	0.35	0.31	3.55	0.87	0.48	-	0.12
2026 Safenlp 2024	1022	UNSAT	0.17	0.73	0.81	2.12	11.0	0.21	0.37	0.46	3.53	0.89	0.49	-	-
2026 Safenlp 2024	1023	SAT	0.58	0.97	0.66	3.64	6.20	1.03	0.12	0.15	0.14	-	0.67	-	✗
2026 Safenlp 2024	1024	SAT	0.48	0.97	0.64	2.18	4.22	0.41	0.11	0.06	0.13	0.91	0.64	-	✗
2026 Safenlp 2024	1025	UNSAT	1.05	1.43	2.13	2.18	11.1	-	11.6	-	-	-	15.9	-	-
2026 Safenlp 2024	1026	UNSAT	1.06	1.48	3.82	2.43	-	-	16.9	-	-	-	-	-	-
2026 Safenlp 2024	1027	SAT	0.63	0.97	0.66	0.03	4.25	0.41	0.13	0.08	0.13	0.94	0.44	0.41	✗
2026 Safenlp 2024	1028	UNSAT	1.17	1.44	1.36	2.16	11.0	1.44	7.34	-	-	-	3.48	-	-
2026 Safenlp 2024	1029	UNSAT	0.14	0.74	0.75	2.16	11.0	0.21	0.35	0.31	3.55	0.85	0.48	-	0.09
2026 Safenlp 2024	1030	SAT	0.68	1.00	0.60	2.40	-	1.23	0.13	0.23	0.17	-	0.59	-	✗
2026 Safenlp 2024	1031	SAT	0.62	0.98	0.64	0.02	4.21	0.42	0.10	0.08	0.14	0.93	0.57	0.39	✗
2026 Safenlp 2024	1032	SAT	0.62	0.98	0.63	0.07	4.23	0.41	0.11	0.07	0.11	0.83	✗	0.34	✗
2026 Safenlp 2024	1033	SAT	0.64	0.97	0.58	0.02	5.04	0.41	0.10	0.25	0.12	0.85	✗	0.46	✗
2026 Safenlp 2024	1034	SAT	0.51	0.97	0.65	2.31	5.45	0.41	0.12	0.08	0.11	0.86	0.65	-	✗
2026 Safenlp 2024	1035	SAT	0.63	0.98	0.65	2.20	5.33	0.21	0.10	0.08	0.13	0.85	1.00	-	✗
2026 Safenlp 2024	1036	UNSAT	0.96	1.44	0.94	2.19	11.0	1.23	3.00	-	-	-	0.69	-	6.26
2026 Safenlp 2024	1037	UNSAT	1.16	1.49	2.17	2.41	-	12.9	12.1	-	-	-	-	-	-
2026 Safenlp 2024	1038	SAT	0.60	0.99	0.59	0.15	4.23	0.41	0.13	0.09	0.13	0.91	0.75	0.50	✗
2026 Safenlp 2024	1039	SAT	0.56	0.97	0.61	3.67	5.84	0.21	0.12	0.10	0.16	0.88	0.63	-	✗
2026 Safenlp 2024	1040	UNSAT	0.18	0.72	0.77	2.18	10.9	0.21	0.36	0.32	3.53	0.83	0.47	-	0.07
2026 Safenlp 2024	1041	SAT	0.53	0.98	0.65	0.46	5.51	0.41	0.12	0.09	0.14	0.85	0.69	-	✗
2026 Safenlp 2024	1042	SAT	0.53	0.97	0.63	✗	6.70	2.05	0.12	0.08	0.13	-	1.08	-	✗
2026 Safenlp 2024	1043	SAT	0.47	0.97	0.64	0.20	5.41	0.41	0.12	0.07	0.13	0.86	1.78	0.59	✗
2026 Safenlp 2024	1044	SAT	0.66	0.96	0.64	3.63	5.44	0.41	0.12	0.23	0.12	0.91	1.12	-	✗
2026 Safenlp 2024	1045	UNSAT	0.17	0.73	0.83	2.21	11.2	0.21	0.35	0.31	3.55	0.88	0.47	-	0.13
2026 Safenlp 2024	1046	UNSAT	0.15	0.73	0.75	2.14	10.9	0.21	0.34	0.32	3.53	0.89	0.47	-	0.09

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Safenlp 2024	1047	SAT	0.37	0.98	0.59	3.76	5.54	0.41	0.10	0.09	0.14	0.95	0.64	-	✗
2026 Safenlp 2024	1048	UNSAT	1.18	1.53	2.76	2.51	-	-	12.6	-	-	-	-	-	-
2026 Safenlp 2024	1049	SAT	0.66	0.97	0.63	✗	6.06	1.23	0.11	0.09	0.13	-	-	-	✗
2026 Safenlp 2024	1050	SAT	0.66	0.98	0.66	0.24	4.95	0.41	0.12	0.09	0.12	0.94	0.59	0.55	✗
2026 Safenlp 2024	1051	SAT	0.70	0.97	0.67	3.64	4.92	0.41	0.12	0.08	0.14	0.94	0.65	-	✗
2026 Safenlp 2024	1052	SAT	0.60	0.98	-	-	-	-	-	-	0.45	-	-	-	✗
2026 Safenlp 2024	1053	UNSAT	0.16	0.74	0.77	2.06	10.9	0.21	0.37	0.45	3.59	0.81	0.46	-	0.08
2026 Safenlp 2024	1054	SAT	0.45	0.96	0.65	<0.01	4.98	0.41	0.12	0.11	0.13	0.83	0.64	0.38	✗
2026 Safenlp 2024	1055	SAT	0.67	0.98	0.62	3.80	5.49	0.41	0.12	0.09	0.20	0.86	0.62	-	✗
2026 Safenlp 2024	1056	SAT	0.70	0.97	0.63	3.67	5.29	0.41	0.13	0.09	0.13	0.83	0.68	-	✗
2026 Safenlp 2024	1057	UNSAT	1.29	1.58	2.37	2.61	-	-	18.3	-	-	-	-	-	-
2026 Safenlp 2024	1058	UNSAT	0.20	0.72	0.83	2.22	10.9	0.82	0.34	0.46	3.64	-	0.57	-	0.05
2026 Safenlp 2024	1059	SAT	0.54	0.96	0.66	0.29	5.38	0.41	0.12	0.06	0.48	0.91	0.60	0.50	✗
2026 Safenlp 2024	1060	SAT	0.41	0.97	0.63	✗	5.31	0.41	0.12	0.08	0.72	0.84	0.61	-	✗
2026 Safenlp 2024	1061	UNSAT	1.62	1.84	4.52	3.06	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	1062	UNSAT	1.61	2.15	18.1	-	-	-	-	-	-	-	-	-	-
2026 Safenlp 2024	1063	UNSAT	0.14	0.73	0.78	2.16	10.9	0.21	0.36	0.33	3.62	0.84	0.46	-	-
2026 Safenlp 2024	1064	SAT	0.61	0.98	0.67	0.02	4.18	0.21	0.11	0.08	0.21	0.86	0.62	0.59	✗
2026 Safenlp 2024	1065	UNSAT	0.21	0.72	0.78	2.13	11.0	0.21	0.36	0.27	3.62	0.88	0.46	-	0.07
2026 Safenlp 2024	1066	SAT	0.68	0.97	0.65	3.67	5.47	0.42	0.13	0.08	0.21	0.90	0.66	-	✗
2026 Safenlp 2024	1067	UNSAT	0.95	1.44	2.09	2.16	11.0	-	10.3	-	-	-	17.1	-	-
2026 Safenlp 2024	1068	UNSAT	0.16	0.73	0.79	2.16	11.0	0.21	0.36	0.32	3.74	0.85	0.43	-	0.04
2026 Safenlp 2024	1069	SAT	0.52	0.97	0.64	3.81	5.55	0.41	0.13	0.08	0.14	0.88	0.58	-	✗
2026 Safenlp 2024	1070	SAT	0.33	0.97	0.62	0.03	4.29	0.41	0.13	0.09	0.11	0.83	0.46	0.43	✗
2026 Safenlp 2024	1071	SAT	0.67	0.96	0.59	0.27	5.42	0.41	0.12	0.10	0.14	0.92	0.56	0.42	✗
2026 Safenlp 2024	1072	SAT	0.54	0.96	0.63	2.33	5.54	1.23	0.11	0.13	0.17	-	0.84	-	✗
2026 Safenlp 2024	1073	UNSAT	0.94	1.52	2.73	2.53	-	6.36	-	-	-	-	-	-	-
2026 Safenlp 2024	1074	UNSAT	0.16	0.74	0.81	2.15	11.0	0.82	0.34	0.30	3.54	-	0.54	-	0.09
2026 Safenlp 2024	1075	SAT	0.48	0.97	0.63	0.11	5.49	0.41	0.10	0.12	0.12	0.88	0.69	0.48	✗
2026 Safenlp 2024	1076	SAT	0.58	0.98	0.62	✗	5.53	0.41	0.13	0.24	0.13	0.91	✗	-	✗
2026 Safenlp 2024	1077	SAT	0.64	0.98	0.59	3.72	5.74	1.23	0.11	0.30	0.14	-	0.63	-	✗
2026 Safenlp 2024	1078	SAT	0.52	0.98	0.64	0.55	5.94	0.41	0.12	0.24	0.10	0.91	0.63	0.07	✗
2026 Safenlp 2024	1079	SAT	0.59	0.97	0.64	3.67	5.71	0.41	0.10	0.11	0.11	0.89	0.73	-	✗
2026 Sat Relu	0	SAT	0.20	0.94	0.21	2.91	9.81	0.41	0.25	0.22	0.45	0.94	0.18	0.52	✗
2026 Sat Relu	1	UNSAT	0.77	4.02	0.22	10.7	-	1.23	0.52	-	-	-	-	-	-
2026 Sat Relu	2	SAT	0.21	0.95	1.02	6.75	11.7	0.62	1.17	0.14	-	60.8	-	1.88	-
2026 Sat Relu	3	UNSAT	1.05	8.14	-	10.9	-	3.29	1.40	-	-	-	-	-	-
2026 Sat Relu	4	SAT	0.12	0.96	0.11	2.85	6.27	0.62	0.21	0.24	0.22	15.5	0.49	0.61	✗
2026 Sat Relu	5	UNSAT	0.57	3.52	0.16	10.6	-	0.82	0.42	-	3.97	-	20.1	-	-
2026 Sat Relu	6	SAT	0.21	0.94	0.31	2.96	12.6	1.23	0.33	0.15	✗	34.5	28.0	0.26	✗
2026 Sat Relu	7	UNSAT	0.79	8.13	49.6	10.8	-	1.85	0.57	-	-	-	-	-	-
2026 Sat Relu	8	SAT	0.19	0.93	0.14	3.01	8.28	0.62	0.22	0.10	0.38	15.7	0.50	0.62	✗
2026 Sat Relu	9	UNSAT	0.57	3.62	0.18	10.6	-	1.03	0.43	-	3.83	-	-	-	-
2026 Sat Relu	10	SAT	0.18	0.95	0.30	3.01	7.95	0.41	0.28	0.10	3.10	3.53	1.85	0.81	✗
2026 Sat Relu	11	UNSAT	0.77	7.45	0.33	10.7	-	1.64	0.51	-	-	-	-	-	-
2026 Sat Relu	12	SAT	0.19	0.95	0.50	3.05	19.9	0.62	0.75	0.30	0.81	34.2	-	0.96	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Sat Relu	13	UNSAT	0.84	7.41	-	10.8	-	2.26	0.95	-	4.40	-	-	-	-
2026 Sat Relu	14	SAT	0.19	0.97	0.29	2.93	8.24	0.21	0.46	0.30	0.20	3.40	3.38	1.07	✗
2026 Sat Relu	15	UNSAT	0.70	7.45	0.30	10.7	-	1.44	0.68	-	4.14	-	-	-	-
2026 Sat Relu	16	SAT	0.18	0.96	0.38	3.00	7.97	0.42	0.52	0.13	0.27	3.86	10.5	1.95	✗
2026 Sat Relu	17	UNSAT	0.74	7.38	0.46	10.7	-	1.64	0.75	-	4.13	-	-	-	-
2026 Sat Relu	18	SAT	0.18	0.96	0.31	2.96	12.1	0.82	0.30	0.12	✗	31.8	2.75	0.94	✗
2026 Sat Relu	19	UNSAT	0.77	8.36	76.6	10.8	-	1.64	0.54	-	-	-	-	-	-
2026 Sat Relu	20	SAT	0.19	0.96	0.33	6.81	7.78	0.21	0.46	0.32	✗	6.73	-	0.99	✗
2026 Sat Relu	21	UNSAT	0.74	5.45	-	10.8	-	1.64	0.69	-	4.21	-	-	-	-
2026 Sat Relu	22	SAT	0.18	0.96	0.42	3.05	9.65	0.41	0.60	0.32	0.27	9.67	-	1.02	✗
2026 Sat Relu	23	UNSAT	0.79	5.51	-	10.7	-	1.85	0.80	-	4.24	-	-	-	-
2026 Sat Relu	24	SAT	0.19	0.94	0.49	6.75	8.13	0.62	0.80	0.15	0.87	36.9	-	1.00	✗
2026 Sat Relu	25	UNSAT	0.87	7.26	-	10.8	-	2.67	1.01	-	4.36	-	-	-	-
2026 Sat Relu	26	SAT	0.20	0.95	1.28	6.80	32.3	0.82	1.27	0.10	-	75.9	-	2.18	-
2026 Sat Relu	27	UNSAT	1.11	8.76	-	11.0	-	4.31	1.49	-	-	-	-	-	-
2026 Sat Relu	28	SAT	0.19	0.92	0.12	2.98	8.43	0.62	0.24	0.12	1.35	16.2	0.68	0.79	✗
2026 Sat Relu	29	UNSAT	0.69	4.07	0.19	10.8	-	1.23	0.45	-	3.88	-	-	-	-
2026 Sat Relu	30	SAT	0.18	0.94	0.34	2.93	12.8	0.21	0.51	0.13	0.21	5.30	-	0.97	✗
2026 Sat Relu	31	UNSAT	0.73	8.04	0.41	10.7	-	1.44	0.73	-	4.28	-	-	-	-
2026 Sat Relu	32	SAT	0.20	0.94	0.23	2.86	9.83	0.21	0.27	0.17	✗	2.17	53.1	0.78	✗
2026 Sat Relu	33	UNSAT	0.74	4.87	0.26	10.7	-	1.44	0.51	-	-	-	-	-	-
2026 Sat Relu	34	SAT	0.10	0.95	0.18	2.92	6.23	0.41	0.27	0.13	0.14	0.93	2.88	0.82	✗
2026 Sat Relu	35	UNSAT	0.70	4.26	0.18	10.7	-	1.23	0.47	-	-	-	-	-	-
2026 Sat Relu	36	SAT	0.18	0.95	0.37	2.89	7.80	0.21	0.65	0.14	0.37	7.05	-	2.00	-
2026 Sat Relu	37	UNSAT	0.76	5.52	0.50	10.8	-	1.64	0.85	-	-	-	-	-	-
2026 Sat Relu	38	SAT	0.11	0.94	0.19	2.86	6.22	0.41	0.31	0.12	0.37	1.34	3.05	0.80	✗
2026 Sat Relu	39	UNSAT	0.75	4.36	8.75	10.8	-	1.23	0.52	-	-	-	-	-	-
2026 Sat Relu	40	SAT	0.17	0.94	0.26	2.91	9.80	0.41	0.39	0.14	0.28	4.13	-	0.95	✗
2026 Sat Relu	41	UNSAT	0.75	8.13	0.32	10.9	-	1.44	0.62	-	4.12	-	-	-	-
2026 Sat Relu	42	SAT	0.10	0.94	0.18	2.92	6.22	0.21	0.26	0.13	0.72	0.73	2.50	0.65	✗
2026 Sat Relu	43	UNSAT	0.89	4.22	0.67	11.0	-	1.03	0.50	-	-	-	-	-	-
2026 Sat Relu	44	SAT	0.19	0.94	0.25	2.94	8.19	1.03	0.27	0.12	✗	29.9	9.76	0.70	✗
2026 Sat Relu	45	UNSAT	0.72	4.44	0.25	10.7	-	1.64	0.49	-	4.09	-	-	-	-
2026 Sat Relu	46	SAT	0.18	0.94	0.55	2.96	11.1	0.62	0.79	0.16	3.20	35.2	-	2.09	-
2026 Sat Relu	47	UNSAT	0.84	7.17	0.59	10.8	-	2.05	1.02	-	-	-	-	-	-
2026 Sat Relu	48	SAT	0.19	0.95	1.12	2.96	10.7	0.62	1.18	0.21	0.22	74.0	-	1.99	-
2026 Sat Relu	49	UNSAT	1.04	8.05	-	10.9	-	3.08	1.39	-	-	-	-	-	-
2026 Sat Relu	50	SAT	0.19	0.95	0.28	6.77	13.7	0.82	0.38	0.13	✗	23.1	-	-	✗
2026 Sat Relu	51	UNSAT	0.80	8.01	-	10.7	-	1.64	0.59	-	-	-	-	-	-
2026 Sat Relu	52	SAT	0.19	0.96	0.40	2.88	7.79	0.42	0.60	0.14	0.37	6.28	15.6	2.19	✗
2026 Sat Relu	53	UNSAT	0.75	5.49	0.42	10.7	-	1.64	0.81	-	-	-	-	-	-
2026 Sat Relu	54	SAT	0.18	0.96	0.29	6.79	20.0	0.21	0.34	0.15	1.16	3.78	10.5	0.90	✗
2026 Sat Relu	55	UNSAT	0.75	7.47	0.38	10.7	-	1.64	0.55	-	-	-	-	-	-
2026 Sat Relu	56	SAT	0.20	0.94	0.17	2.91	7.86	0.41	0.21	0.12	0.61	0.78	3.04	0.73	✗
2026 Sat Relu	57	UNSAT	0.61	4.02	0.21	10.6	-	1.23	0.46	-	3.84	-	-	-	-
2026 Sat Relu	58	SAT	0.19	0.95	0.34	2.94	11.7	0.41	0.33	0.32	✗	4.63	39.1	0.79	✗
2026 Sat Relu	59	UNSAT	0.75	8.15	0.35	10.6	-	1.85	0.56	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Sat Relu	60	SAT	0.10	0.96	0.33	2.97	6.24	0.21	0.54	0.29	0.35	4.97	-	0.97	✗
2026 Sat Relu	61	UNSAT	0.72	8.06	0.40	10.7	-	1.44	0.78	-	4.25	-	-	-	-
2026 Sat Relu	62	SAT	0.18	0.96	0.33	2.97	11.0	0.82	0.47	0.12	✗	25.9	-	0.83	✗
2026 Sat Relu	63	UNSAT	0.73	5.43	-	10.7	-	1.85	0.68	-	4.20	-	-	-	-
2026 Sat Relu	64	SAT	0.19	0.96	0.44	3.02	16.3	0.62	0.46	0.14	✗	40.7	-	1.10	✗
2026 Sat Relu	65	UNSAT	0.77	6.09	0.51	10.8	-	1.85	0.69	-	4.18	-	-	-	-
2026 Sat Relu	66	SAT	0.17	0.94	0.26	2.99	12.3	0.41	0.39	0.12	0.16	3.79	-	1.23	✗
2026 Sat Relu	67	UNSAT	0.72	7.32	2.33	10.6	-	1.44	0.64	-	4.26	-	-	-	-
2026 Sat Relu	68	SAT	0.18	0.96	0.32	6.71	13.9	0.21	0.52	0.14	1.69	5.60	-	1.34	✗
2026 Sat Relu	69	UNSAT	0.73	8.29	0.41	10.7	-	1.44	0.73	-	4.22	-	-	-	-
2026 Sat Relu	70	SAT	0.17	0.95	0.42	6.76	17.8	0.82	0.48	0.15	✗	26.0	-	1.64	-
2026 Sat Relu	71	UNSAT	0.81	5.78	0.44	10.7	-	2.05	0.72	-	4.25	-	-	-	-
2026 Sat Relu	72	SAT	0.19	0.99	0.24	3.03	7.96	0.82	0.26	0.15	1.89	21.5	5.78	1.09	✗
2026 Sat Relu	73	UNSAT	0.78	4.60	0.26	10.7	-	1.44	0.49	-	3.99	-	-	-	-
2026 Sat Relu	74	SAT	0.17	0.94	0.22	2.95	9.86	0.21	0.33	0.15	✗	1.89	7.45	0.99	✗
2026 Sat Relu	75	UNSAT	0.72	4.55	13.9	10.7	-	1.44	0.55	-	4.14	-	-	-	-
2026 Sat Relu	76	SAT	0.18	0.99	0.35	2.92	16.6	0.82	0.40	0.13	2.15	30.3	-	0.59	✗
2026 Sat Relu	77	UNSAT	0.77	5.44	-	10.7	-	1.85	0.63	-	-	-	-	-	-
2026 Sat Relu	78	SAT	0.19	0.96	0.60	6.73	9.99	0.21	0.89	0.17	✗	23.3	-	0.98	✗
2026 Sat Relu	79	UNSAT	0.88	7.38	-	11.0	-	2.46	1.12	-	4.43	-	-	-	-
2026 Sat Relu	80	SAT	0.19	0.94	0.09	2.94	7.82	✗	0.13	0.13	0.59	1.25	2.16	0.54	✗
2026 Sat Relu	81	UNSAT	0.55	3.22	0.13	10.5	-	0.82	0.38	-	3.78	0.33	2.38	-	36.0
2026 Sat Relu	82	SAT	0.19	0.93	0.19	2.94	9.85	0.62	0.22	0.12	0.38	16.2	3.93	0.79	✗
2026 Sat Relu	83	UNSAT	0.58	3.52	0.21	10.5	-	1.23	0.44	-	3.88	-	-	-	-
2026 Sat Relu	84	SAT	0.12	0.93	0.31	2.92	6.17	0.21	0.42	0.35	0.28	2.31	6.65	0.83	✗
2026 Sat Relu	85	UNSAT	0.77	4.46	0.33	10.8	-	1.23	0.66	-	4.11	-	-	-	-
2026 Sat Relu	86	SAT	0.18	0.95	0.33	2.95	10.3	0.21	0.42	0.14	✗	6.59	-	1.09	✗
2026 Sat Relu	87	UNSAT	0.73	8.00	0.38	10.7	-	1.64	0.64	-	4.22	-	-	-	-
2026 Sat Relu	88	SAT	0.18	0.97	0.33	2.91	7.74	0.21	0.39	0.12	0.13	3.17	3.88	0.81	✗
2026 Sat Relu	89	UNSAT	0.72	7.45	1.45	10.8	-	1.44	0.60	-	4.16	-	-	-	-
2026 Sat Relu	90	SAT	0.19	0.93	0.26	3.01	9.79	0.41	0.33	0.29	1.30	2.68	2.99	0.71	✗
2026 Sat Relu	91	UNSAT	0.89	7.01	0.38	10.7	-	1.64	0.54	-	-	-	-	-	-
2026 Sat Relu	92	SAT	0.18	0.97	0.43	2.95	11.8	0.82	0.54	0.15	✗	48.9	-	1.81	-
2026 Sat Relu	93	UNSAT	0.76	6.22	0.49	10.7	-	2.05	0.76	-	4.23	-	-	-	-
2026 Sat Relu	94	SAT	0.15	0.96	0.39	2.93	6.25	0.41	0.63	0.32	0.13	6.98	10.3	2.10	✗
2026 Sat Relu	95	UNSAT	0.76	5.43	0.51	10.7	-	1.64	0.86	-	4.29	-	-	-	-
2026 Sat Relu	96	SAT	0.18	0.99	0.31	2.96	7.77	0.21	0.56	0.12	0.13	5.28	5.72	2.00	✗
2026 Sat Relu	97	UNSAT	0.73	8.27	0.39	10.7	-	1.64	0.79	-	4.25	-	-	-	-
2026 Sat Relu	98	SAT	0.18	0.94	0.17	2.98	8.46	0.21	0.17	0.08	0.77	0.32	0.43	0.74	✗
2026 Sat Relu	99	UNSAT	0.58	3.56	0.35	10.6	-	1.03	0.38	-	3.76	-	81.4	-	-
2026 Soundnessbench 2026	0	SAT	20.4	14.7	13.1	9.48	-	-	-	11.2	-	-	-	-	-
2026 Soundnessbench 2026	1	UNSAT	0.84	3.77	28.7	12.1	-	1.03	-	-	53.8	-	-	-	-
2026 Soundnessbench 2026	2	SAT	28.8	19.0	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	3	SAT	20.3	11.7	-	8.58	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	4	SAT	27.3	17.8	-	✗	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	5	SAT	34.8	-	-	✗	-	-	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Soundnessbench 2026	6	SAT	21.1	6.03	-	3.42	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	7	SAT	21.1	12.2	-	4.31	-	-	-	10.9	-	-	-	-	-
2026 Soundnessbench 2026	8	UNSAT	0.80	3.83	28.8	12.1	-	1.03	-	-	52.3	-	-	-	-
2026 Soundnessbench 2026	9	SAT	113	-	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	10	SAT	27.3	22.9	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	11	UNSAT	0.67	3.36	27.3	11.9	-	0.82	-	-	37.3	-	-	-	-
2026 Soundnessbench 2026	12	SAT	27.4	15.7	-	✗	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	13	SAT	20.4	13.4	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	14	UNSAT	0.81	3.83	28.7	12.1	-	1.03	-	-	52.8	-	-	-	-
2026 Soundnessbench 2026	15	SAT	27.5	8.04	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	16	SAT	21.1	7.76	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	17	SAT	20.1	6.18	7.72	3.49	-	-	-	14.6	-	-	-	-	-
2026 Soundnessbench 2026	18	SAT	41.5	-	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	19	SAT	20.1	7.38	9.94	5.37	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	20	SAT	21.0	10.6	-	-	-	-	-	14.8	-	-	-	-	-
2026 Soundnessbench 2026	21	UNSAT	0.66	3.39	27.2	11.8	-	0.82	-	-	38.2	-	-	-	-
2026 Soundnessbench 2026	22	SAT	20.9	13.1	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	23	SAT	20.2	6.84	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	24	SAT	28.9	128	-	✗	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	25	UNSAT	0.80	3.78	28.7	12.1	-	1.03	-	-	53.9	-	-	-	-
2026 Soundnessbench 2026	26	SAT	28.2	13.4	-	✗	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	27	UNSAT	0.85	3.77	28.6	12.1	-	1.03	-	-	52.3	-	-	-	-
2026 Soundnessbench 2026	28	SAT	20.3	8.75	-	5.06	-	-	-	8.46	-	-	-	-	-
2026 Soundnessbench 2026	29	SAT	20.3	14.9	6.57	-	-	-	-	14.1	-	-	-	-	-
2026 Soundnessbench 2026	30	UNSAT	0.83	3.76	28.7	12.1	-	1.03	-	-	-	-	-	-	-
2026 Soundnessbench 2026	31	SAT	20.9	16.4	-	5.07	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	32	UNSAT	0.87	3.77	28.6	12.1	-	1.03	-	-	53.5	-	-	-	-
2026 Soundnessbench 2026	33	?	✗	-	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	34	UNSAT	0.66	3.45	27.2	11.8	-	0.82	-	-	43.4	-	-	-	-
2026 Soundnessbench 2026	35	SAT	20.8	13.4	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	36	SAT	20.4	7.50	5.28	-	-	-	-	8.57	-	-	-	-	-
2026 Soundnessbench 2026	37	SAT	20.8	13.1	-	3.58	-	-	-	7.13	-	-	-	-	-
2026 Soundnessbench 2026	38	SAT	28.8	17.3	-	✗	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	39	UNSAT	0.82	3.77	28.7	12.1	-	1.03	-	-	59.6	-	-	-	-
2026 Soundnessbench 2026	40	SAT	29.0	56.8	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	41	UNSAT	0.85	3.77	28.7	12.1	-	1.03	-	-	-	-	-	-	-
2026 Soundnessbench 2026	42	SAT	20.4	6.00	-	3.59	-	-	-	8.13	-	-	-	-	-
2026 Soundnessbench 2026	43	SAT	29.0	14.4	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	44	SAT	76.0	-	-	-	-	-	-	11.2	-	-	-	-	-
2026 Soundnessbench 2026	45	SAT	27.2	82.9	-	✗	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	46	UNSAT	0.83	3.78	28.6	12.1	-	1.03	-	-	53.6	-	-	-	-
2026 Soundnessbench 2026	47	SAT	20.7	14.5	-	-	-	-	-	9.27	-	-	-	-	-
2026 Soundnessbench 2026	48	SAT	20.2	6.84	6.10	3.55	-	-	-	5.41	-	-	-	-	-
2026 Soundnessbench 2026	49	SAT	20.1	16.1	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	50	SAT	21.1	13.3	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	51	SAT	20.2	13.6	7.94	4.84	-	-	-	10.8	-	-	-	-	-
2026 Soundnessbench 2026	52	SAT	21.1	15.0	-	-	-	-	-	6.46	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Soundnessbench 2026	53	SAT	28.9	-	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	54	SAT	82.3	-	-	✗	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	55	SAT	20.2	6.51	-	3.66	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	56	SAT	20.8	12.4	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	57	SAT	20.5	9.95	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	58	SAT	28.2	8.45	-	-	-	-	-	-	-	-	-	-	-
2026 Soundnessbench 2026	59	UNSAT	0.82	3.79	28.6	12.1	-	1.03	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	0	UNSAT	25.1	31.2	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	1	SAT	1.11	1.87	2.25	24.5	-	-	4.52	2.63	1.33	-	-	-	-
2026 Tinyimagenet 2024	2	UNSAT	29.3	22.4	-	50.5	-	-	70.3	-	-	-	-	-	-
2026 Tinyimagenet 2024	3	UNSAT	42.4	23.9	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	4	UNSAT	34.0	23.3	-	82.3	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	5	UNSAT	21.1	23.5	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	6	UNSAT	24.0	25.9	-	-	-	-	79.9	-	-	-	-	-	-
2026 Tinyimagenet 2024	7	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	8	UNSAT	3.07	12.0	9.01	26.7	34.7	-	45.4	-	-	-	-	-	-
2026 Tinyimagenet 2024	9	UNSAT	28.0	22.9	97.0	50.3	32.9	-	56.9	-	-	-	-	-	-
2026 Tinyimagenet 2024	10	UNSAT	26.0	31.5	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	11	UNSAT	28.7	21.9	22.8	42.6	35.1	-	52.8	-	-	-	-	-	-
2026 Tinyimagenet 2024	12	UNSAT	2.57	11.8	8.70	26.1	34.8	-	45.4	-	-	-	-	-	-
2026 Tinyimagenet 2024	13	UNSAT	21.2	23.5	66.1	79.7	37.9	-	61.7	-	-	-	-	-	-
2026 Tinyimagenet 2024	14	UNSAT	35.8	27.7	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	15	UNSAT	19.4	23.9	32.7	94.7	-	-	60.9	-	-	-	-	-	-
2026 Tinyimagenet 2024	16	UNSAT	19.4	25.5	-	-	-	-	80.5	-	-	-	-	-	-
2026 Tinyimagenet 2024	17	UNSAT	29.0	22.3	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	18	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	19	UNSAT	30.4	25.7	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	20	SAT	1.14	15.8	2.94	25.1	-	-	4.50	3.04	2.99	-	-	-	-
2026 Tinyimagenet 2024	21	SAT	1.22	1.78	2.34	25.4	-	-	4.51	2.71	0.99	-	-	-	-
2026 Tinyimagenet 2024	22	UNSAT	29.0	21.9	36.7	43.2	30.8	-	54.2	-	-	-	-	-	-
2026 Tinyimagenet 2024	23	UNSAT	19.1	23.0	21.7	56.2	36.0	-	55.6	-	-	-	-	-	-
2026 Tinyimagenet 2024	24	UNSAT	17.4	22.4	-	63.9	-	-	67.0	-	-	-	-	-	-
2026 Tinyimagenet 2024	25	UNSAT	22.3	24.3	34.7	46.6	31.0	-	65.5	-	-	-	-	-	-
2026 Tinyimagenet 2024	26	UNSAT	28.1	26.7	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	27	UNSAT	29.0	21.8	12.6	45.7	29.8	-	50.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	28	UNSAT	21.9	23.8	-	75.3	-	-	87.4	-	-	-	-	-	-
2026 Tinyimagenet 2024	29	UNSAT	27.3	21.9	17.7	37.2	34.8	-	51.5	-	-	-	-	-	-
2026 Tinyimagenet 2024	30	SAT	1.12	1.89	2.28	24.9	-	-	4.50	2.74	1.72	-	-	-	-
2026 Tinyimagenet 2024	31	SAT	1.12	1.94	2.33	24.5	-	-	4.51	2.97	2.13	-	-	-	-
2026 Tinyimagenet 2024	32	UNSAT	28.9	21.8	92.8	50.9	35.5	-	57.4	-	-	-	-	-	-
2026 Tinyimagenet 2024	33	UNSAT	20.2	24.4	98.4	81.5	33.1	-	67.3	-	-	-	-	-	-
2026 Tinyimagenet 2024	34	SAT	1.19	15.5	-	25.8	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	35	SAT	1.12	1.88	2.41	25.1	-	-	4.57	2.80	1.84	-	-	-	-
2026 Tinyimagenet 2024	36	SAT	1.18	1.80	2.15	24.6	41.5	-	4.49	2.43	0.54	-	-	-	-
2026 Tinyimagenet 2024	37	UNSAT	3.13	12.1	8.45	27.6	29.7	-	45.4	-	-	-	-	-	-
2026 Tinyimagenet 2024	38	UNSAT	29.3	21.9	12.9	33.2	30.1	-	50.0	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Tinyimagenet 2024	39	UNSAT	25.4	28.4	-	-	-	-	84.3	-	-	-	-	-	-
2026 Tinyimagenet 2024	40	SAT	1.13	1.79	2.21	25.0	22.6	-	4.49	2.47	1.45	-	-	-	-
2026 Tinyimagenet 2024	41	SAT	1.18	1.91	2.16	24.9	-	-	4.52	2.53	1.19	-	-	-	-
2026 Tinyimagenet 2024	42	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	43	UNSAT	23.7	20.7	26.5	38.5	30.8	-	54.4	-	-	-	-	-	-
2026 Tinyimagenet 2024	44	SAT	1.13	1.78	2.12	24.8	29.8	-	4.52	2.46	0.73	-	-	-	-
2026 Tinyimagenet 2024	45	UNSAT	33.4	24.5	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	46	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	47	UNSAT	35.5	23.3	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	48	UNSAT	37.2	28.2	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	49	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	50	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	51	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	52	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	53	UNSAT	26.4	21.7	79.8	59.3	-	-	55.7	-	-	-	-	-	-
2026 Tinyimagenet 2024	54	UNSAT	27.9	22.2	-	46.1	38.1	-	65.8	-	-	-	-	-	-
2026 Tinyimagenet 2024	55	UNSAT	51.1	35.6	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	56	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	57	SAT	1.15	1.88	2.32	25.7	-	-	4.54	2.78	2.08	-	-	-	-
2026 Tinyimagenet 2024	58	SAT	1.15	15.0	2.34	25.5	-	-	4.52	2.89	1.76	-	-	-	-
2026 Tinyimagenet 2024	59	UNSAT	4.79	22.4	9.18	29.3	30.4	-	50.9	-	-	-	-	-	-
2026 Tinyimagenet 2024	60	UNSAT	28.4	25.5	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	61	UNSAT	0.90	11.6	8.71	19.8	29.2	-	44.0	-	-	-	-	-	-
2026 Tinyimagenet 2024	62	UNSAT	17.7	22.6	-	55.6	-	-	63.7	-	-	-	-	-	-
2026 Tinyimagenet 2024	63	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	64	SAT	1.15	16.0	2.34	26.1	-	-	4.52	2.79	2.01	-	-	-	-
2026 Tinyimagenet 2024	65	UNSAT	3.18	11.8	8.46	28.1	29.6	-	45.4	-	-	-	-	-	-
2026 Tinyimagenet 2024	66	UNSAT	32.1	22.7	79.1	83.6	33.2	-	60.4	-	-	-	-	-	-
2026 Tinyimagenet 2024	67	UNSAT	3.91	22.9	14.6	27.7	30.0	-	51.5	-	-	-	-	-	-
2026 Tinyimagenet 2024	68	UNSAT	34.1	24.5	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	69	SAT	1.51	16.7	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	70	UNSAT	2.41	11.2	7.73	25.9	29.5	-	44.0	-	-	-	-	-	-
2026 Tinyimagenet 2024	71	UNSAT	3.90	22.2	9.11	27.9	29.6	-	50.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	72	UNSAT	29.4	23.6	18.1	58.0	35.2	-	54.9	-	-	-	-	-	-
2026 Tinyimagenet 2024	73	UNSAT	31.4	22.4	25.1	67.2	30.0	-	55.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	74	UNSAT	21.8	23.6	40.0	76.3	35.5	-	56.3	-	-	-	-	-	-
2026 Tinyimagenet 2024	75	UNSAT	3.21	22.3	9.31	27.0	34.9	-	50.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	76	UNSAT	27.3	21.7	69.9	40.0	35.6	-	54.4	-	-	-	-	-	-
2026 Tinyimagenet 2024	77	UNSAT	4.40	22.8	9.80	28.5	35.1	-	50.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	78	UNSAT	28.8	22.3	77.0	42.8	30.9	-	54.8	-	-	-	-	-	-
2026 Tinyimagenet 2024	79	UNSAT	28.4	21.8	72.3	44.6	31.3	-	53.6	-	-	-	-	-	-
2026 Tinyimagenet 2024	80	SAT	1.21	1.91	2.21	25.5	-	-	4.50	2.62	1.19	-	-	-	-
2026 Tinyimagenet 2024	81	UNSAT	2.91	12.3	8.31	26.7	29.5	-	45.5	-	-	-	-	-	-
2026 Tinyimagenet 2024	82	UNSAT	30.1	22.3	18.2	42.0	30.0	-	51.6	-	-	-	-	-	-
2026 Tinyimagenet 2024	83	UNSAT	29.7	21.9	-	59.2	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	84	UNSAT	0.90	11.5	8.71	19.7	34.3	-	44.0	-	-	-	-	-	-
2026 Tinyimagenet 2024	85	UNSAT	23.8	23.9	-	-	-	-	72.9	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Tinyimagenet 2024	86	SAT	1.22	1.77	2.12	24.6	13.8	-	4.54	2.46	0.60	-	-	-	-
2026 Tinyimagenet 2024	87	UNSAT	0.89	11.3	8.05	19.6	29.2	-	44.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	88	SAT	1.18	15.2	2.19	25.5	-	-	4.54	2.68	1.52	-	-	-	-
2026 Tinyimagenet 2024	89	UNSAT	21.0	23.2	-	69.6	-	-	72.7	-	-	-	-	-	-
2026 Tinyimagenet 2024	90	SAT	1.18	1.78	2.14	25.8	52.0	-	4.53	2.61	0.44	-	-	-	-
2026 Tinyimagenet 2024	91	UNSAT	30.9	22.8	-	82.0	-	-	67.8	-	-	-	-	-	-
2026 Tinyimagenet 2024	92	UNSAT	20.8	25.0	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	93	UNSAT	55.4	38.5	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	94	UNSAT	63.2	29.8	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	95	UNSAT	30.8	22.3	13.7	42.4	30.0	-	50.9	-	-	-	-	-	-
2026 Tinyimagenet 2024	96	UNSAT	20.2	23.2	-	85.4	-	-	68.5	-	-	-	-	-	-
2026 Tinyimagenet 2024	97	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	98	UNSAT	27.0	21.7	16.3	42.5	29.6	-	51.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	99	UNSAT	20.8	23.3	44.2	68.2	36.2	-	59.9	-	-	-	-	-	-
2026 Tinyimagenet 2024	100	UNSAT	26.6	21.4	70.9	41.8	35.1	-	53.5	-	-	-	-	-	-
2026 Tinyimagenet 2024	101	UNSAT	2.98	12.3	9.67	26.7	29.7	-	45.3	-	-	-	-	-	-
2026 Tinyimagenet 2024	102	UNSAT	19.8	22.7	17.2	53.2	30.2	-	54.3	-	-	-	-	-	-
2026 Tinyimagenet 2024	103	UNSAT	26.4	25.1	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	104	SAT	1.17	2.02	2.26	25.5	-	-	4.50	2.71	1.62	-	-	-	-
2026 Tinyimagenet 2024	105	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	106	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	107	UNSAT	22.1	24.5	-	-	-	-	94.8	-	-	-	-	-	-
2026 Tinyimagenet 2024	108	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	109	UNSAT	28.7	21.9	-	52.0	-	-	66.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	110	SAT	-	15.1	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	111	SAT	1.13	1.92	2.31	25.5	-	-	4.51	2.90	2.27	-	-	-	-
2026 Tinyimagenet 2024	112	SAT	1.14	1.92	2.22	24.5	-	-	4.51	2.67	1.69	-	-	-	-
2026 Tinyimagenet 2024	113	UNSAT	19.0	23.1	-	53.8	35.3	-	63.7	-	-	-	-	-	-
2026 Tinyimagenet 2024	114	UNSAT	3.47	22.5	9.50	39.1	29.9	-	52.0	-	-	-	-	-	-
2026 Tinyimagenet 2024	115	UNSAT	28.8	22.3	21.6	57.5	35.9	-	55.7	-	-	-	-	-	-
2026 Tinyimagenet 2024	116	UNSAT	31.4	22.7	19.4	54.0	30.2	-	51.6	-	-	-	-	-	-
2026 Tinyimagenet 2024	117	SAT	1.18	15.6	2.27	25.9	-	-	4.53	2.95	1.85	-	-	-	-
2026 Tinyimagenet 2024	118	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	119	UNSAT	29.2	22.0	-	53.0	37.3	-	60.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	120	UNSAT	29.2	22.1	-	49.8	37.8	-	60.2	-	-	-	-	-	-
2026 Tinyimagenet 2024	121	UNSAT	27.5	22.0	-	54.0	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	122	UNSAT	31.2	22.8	69.6	52.6	38.6	-	58.4	-	-	-	-	-	-
2026 Tinyimagenet 2024	123	SAT	1.22	1.79	2.29	25.1	36.0	-	4.56	2.47	0.79	-	-	-	-
2026 Tinyimagenet 2024	124	UNSAT	27.4	21.7	77.2	46.5	30.9	-	54.4	-	-	-	-	-	-
2026 Tinyimagenet 2024	125	UNSAT	31.5	23.7	-	-	-	-	66.3	-	-	-	-	-	-
2026 Tinyimagenet 2024	126	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	127	UNSAT	3.17	11.7	8.07	26.9	29.7	-	45.5	-	-	-	-	-	-
2026 Tinyimagenet 2024	128	UNSAT	35.3	23.5	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	129	UNSAT	26.6	21.4	47.7	37.7	35.0	-	52.2	-	-	-	-	-	-
2026 Tinyimagenet 2024	130	SAT	1.15	1.89	2.39	24.9	-	-	4.54	2.82	2.02	-	-	-	-
2026 Tinyimagenet 2024	131	SAT	1.60	14.7	2.81	85.6	-	-	4.52	-	-	-	-	-	-
2026 Tinyimagenet 2024	132	UNSAT	29.0	22.1	-	51.2	35.0	-	57.8	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Tinyimagenet 2024	133	UNSAT	19.3	24.5	-	-	-	-	76.2	-	-	-	-	-	-
2026 Tinyimagenet 2024	134	UNSAT	21.9	25.1	55.8	45.1	-	-	65.6	-	-	-	-	-	-
2026 Tinyimagenet 2024	135	UNSAT	41.8	23.5	-	90.2	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	136	SAT	1.28	1.89	2.24	24.6	-	-	4.51	2.58	1.13	-	-	-	-
2026 Tinyimagenet 2024	137	UNSAT	3.31	12.3	9.26	28.1	29.6	-	50.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	138	UNSAT	3.65	21.7	8.49	27.5	34.7	-	50.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	139	UNSAT	29.0	22.0	-	49.9	39.0	-	59.9	-	-	-	-	-	-
2026 Tinyimagenet 2024	140	UNSAT	0.91	11.5	8.63	19.7	34.3	-	44.0	-	-	-	-	-	-
2026 Tinyimagenet 2024	141	UNSAT	30.1	22.6	14.2	86.0	30.2	-	51.8	-	-	-	-	-	-
2026 Tinyimagenet 2024	142	UNSAT	45.0	24.4	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	143	UNSAT	28.9	22.0	42.6	42.1	35.0	-	52.3	-	-	-	-	-	-
2026 Tinyimagenet 2024	144	UNSAT	28.6	30.1	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	145	UNSAT	3.13	11.8	7.96	27.1	34.5	-	45.5	-	-	-	-	-	-
2026 Tinyimagenet 2024	146	SAT	1.17	2.16	-	-	-	-	4.52	3.12	2.44	-	-	-	-
2026 Tinyimagenet 2024	147	UNSAT	28.9	22.3	13.6	39.6	34.9	-	50.9	-	-	-	-	-	-
2026 Tinyimagenet 2024	148	UNSAT	30.3	22.6	19.4	72.7	34.9	-	53.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	149	UNSAT	36.7	23.5	-	97.0	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	150	UNSAT	19.4	24.1	-	-	-	-	72.7	-	-	-	-	-	-
2026 Tinyimagenet 2024	151	UNSAT	30.7	22.3	13.5	40.3	29.7	-	52.2	-	-	-	-	-	-
2026 Tinyimagenet 2024	152	SAT	1.14	1.78	2.19	24.8	24.6	-	4.51	2.52	0.53	-	-	-	-
2026 Tinyimagenet 2024	153	UNSAT	27.6	21.9	42.7	43.5	30.1	-	53.8	-	-	-	-	-	-
2026 Tinyimagenet 2024	154	UNSAT	24.0	28.0	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	155	UNSAT	28.7	22.2	-	49.1	33.9	-	56.2	-	-	-	-	-	-
2026 Tinyimagenet 2024	156	SAT	1.12	1.87	2.20	24.8	-	-	4.52	2.56	1.03	-	-	-	-
2026 Tinyimagenet 2024	157	SAT	1.17	15.3	2.32	25.6	-	-	4.50	2.87	2.11	-	-	-	-
2026 Tinyimagenet 2024	158	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	159	UNSAT	3.31	12.5	9.64	27.0	34.8	-	45.5	-	-	-	-	-	-
2026 Tinyimagenet 2024	160	UNSAT	29.0	23.2	-	73.3	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	161	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	162	UNSAT	29.0	23.1	71.0	64.6	35.2	-	60.2	-	-	-	-	-	-
2026 Tinyimagenet 2024	163	SAT	1.30	1.77	2.21	24.8	56.0	-	4.59	2.46	0.58	-	-	-	-
2026 Tinyimagenet 2024	164	UNSAT	29.4	22.1	-	74.2	-	-	57.2	-	-	-	-	-	-
2026 Tinyimagenet 2024	165	UNSAT	32.0	25.1	26.7	43.3	30.7	-	59.8	-	-	-	-	-	-
2026 Tinyimagenet 2024	166	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	167	UNSAT	28.7	23.0	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	168	UNSAT	30.6	23.1	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	169	UNSAT	3.08	12.4	9.34	26.8	34.7	-	45.5	-	-	-	-	-	-
2026 Tinyimagenet 2024	170	UNSAT	22.0	23.9	43.5	-	35.2	-	55.7	-	-	-	-	-	-
2026 Tinyimagenet 2024	171	UNSAT	30.4	21.9	-	48.2	-	-	59.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	172	SAT	1.17	1.77	2.16	24.6	14.9	-	4.55	2.46	0.60	-	-	-	-
2026 Tinyimagenet 2024	173	UNSAT	29.0	22.2	-	50.3	36.4	-	55.7	-	-	-	-	-	-
2026 Tinyimagenet 2024	174	UNSAT	21.1	23.4	-	85.9	-	-	95.4	-	-	-	-	-	-
2026 Tinyimagenet 2024	175	UNSAT	34.2	26.4	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	176	SAT	1.19	1.89	2.14	25.2	-	-	4.54	2.70	0.86	-	-	-	-
2026 Tinyimagenet 2024	177	UNSAT	23.3	24.6	56.7	42.5	30.6	-	60.7	-	-	-	-	-	-
2026 Tinyimagenet 2024	178	UNSAT	0.89	11.5	8.28	19.6	34.2	-	44.0	-	-	-	-	-	-
2026 Tinyimagenet 2024	179	SAT	1.18	1.77	2.23	25.3	-	-	4.55	2.56	1.08	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Tinyimagenet 2024	180	UNSAT	31.7	22.8	-	77.9	-	-	79.6	-	-	-	-	-	-
2026 Tinyimagenet 2024	181	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	182	UNSAT	29.9	27.6	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	183	SAT	1.13	1.87	2.22	24.6	-	-	4.60	2.69	1.55	-	-	-	-
2026 Tinyimagenet 2024	184	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	185	UNSAT	29.1	23.5	37.5	66.2	30.2	-	55.8	-	-	-	-	-	-
2026 Tinyimagenet 2024	186	UNSAT	20.6	24.3	48.0	69.9	30.7	-	63.7	-	-	-	-	-	-
2026 Tinyimagenet 2024	187	SAT	1.20	15.4	2.20	25.8	-	-	4.56	2.75	1.26	-	-	-	-
2026 Tinyimagenet 2024	188	UNSAT	31.6	22.5	90.7	45.4	35.6	-	55.6	-	-	-	-	-	-
2026 Tinyimagenet 2024	189	UNSAT	20.1	23.8	-	-	35.9	-	70.2	-	-	-	-	-	-
2026 Tinyimagenet 2024	190	UNSAT	3.63	13.4	9.52	28.2	34.9	-	50.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	191	SAT	1.37	1.79	2.18	24.8	44.8	-	4.52	2.55	0.54	-	-	-	-
2026 Tinyimagenet 2024	192	UNSAT	29.9	22.2	42.9	47.6	30.5	-	54.9	-	-	-	-	-	-
2026 Tinyimagenet 2024	193	UNSAT	39.9	26.0	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	194	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	195	UNSAT	47.4	26.0	-	-	-	-	-	-	-	-	-	-	-
2026 Tinyimagenet 2024	196	UNSAT	29.6	22.3	36.5	66.3	35.2	-	53.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	197	UNSAT	25.8	23.2	92.7	48.8	-	-	61.1	-	-	-	-	-	-
2026 Tinyimagenet 2024	198	UNSAT	3.04	22.5	8.25	30.0	34.8	-	54.4	-	-	-	-	-	-
2026 Tinyimagenet 2024	199	UNSAT	36.4	25.5	-	-	-	-	-	-	-	-	-	-	-
2026 Tllverifybench 2023	0	UNSAT	1.03	1.99	0.22	11.3	37.4	2.67	10.7	-	-	0.95	1.03	24.2	46.6
2026 Tllverifybench 2023	1	UNSAT	1.09	1.93	0.35	11.1	241	3.89	21.1	-	-	1.08	3.51	23.5	341
2026 Tllverifybench 2023	2	SAT	0.18	1.08	0.06	0.09	9.75	0.41	1.29	0.25	-	0.81	0.11	0.28	✗
2026 Tllverifybench 2023	3	UNSAT	1.15	1.91	0.28	11.0	251	3.48	19.2	-	-	1.11	3.38	24.2	521
2026 Tllverifybench 2023	4	SAT	0.27	1.15	0.66	0.09	10.1	0.41	1.74	0.28	-	8.04	0.12	0.23	✗
2026 Tllverifybench 2023	5	UNSAT	1.44	2.10	1.43	11.1	361	3.49	31.0	-	-	8.12	-	25.1	279
2026 Tllverifybench 2023	6	UNSAT	1.54	2.09	1.50	11.3	334	4.72	30.7	-	-	8.70	-	25.5	548
2026 Tllverifybench 2023	7	UNSAT	1.57	2.09	1.68	11.3	343	4.51	30.7	-	-	8.39	-	25.5	346
2026 Tllverifybench 2023	8	UNSAT	2.12	2.56	1.79	11.5	562	6.56	48.6	-	-	39.4	-	26.0	-
2026 Tllverifybench 2023	9	SAT	0.32	1.17	0.81	0.15	11.3	0.41	2.45	0.31	-	40.7	1.04	0.50	✗
2026 Tllverifybench 2023	10	SAT	0.36	1.22	0.83	3.00	12.2	6.77	2.44	1.54	-	40.9	6.31	7.17	✗
2026 Tllverifybench 2023	11	UNSAT	2.25	2.68	1.81	11.5	548	9.63	46.6	-	-	41.1	-	26.0	-
2026 Tllverifybench 2023	12	UNSAT	3.08	3.38	3.30	11.7	-	19.9	-	-	-	126	-	27.3	-
2026 Tllverifybench 2023	13	SAT	0.33	1.21	1.02	0.24	10.8	0.62	2.61	0.40	-	121	2.12	0.75	✗
2026 Tllverifybench 2023	14	UNSAT	2.84	3.38	2.84	11.6	-	13.1	50.4	-	-	125	-	30.3	-
2026 Tllverifybench 2023	15	SAT	0.33	1.23	0.98	0.24	10.7	0.62	2.69	0.39	-	127	2.29	0.69	✗
2026 Tllverifybench 2023	16	UNSAT	4.27	5.43	5.20	12.7	-	95.7	108	-	-	312	-	30.0	-
2026 Tllverifybench 2023	17	SAT	0.45	1.37	1.94	0.60	13.0	3.49	4.34	0.94	-	303	3.96	1.01	✗
2026 Tllverifybench 2023	18	UNSAT	4.76	5.56	6.00	12.7	-	111	98.0	-	-	308	-	33.3	-
2026 Tllverifybench 2023	19	UNSAT	3.98	5.48	4.63	12.2	-	103	76.1	-	-	303	-	33.3	-
2026 Tllverifybench 2023	20	UNSAT	5.81	11.5	11.2	13.6	-	245	125	-	-	-	-	36.4	-
2026 Tllverifybench 2023	21	SAT	0.76	1.63	3.74	4.24	21.2	2.87	6.22	2.58	-	-	-	2.71	✗
2026 Tllverifybench 2023	22	UNSAT	4.62	10.8	5.71	12.9	-	109	88.0	-	-	-	-	35.7	-
2026 Tllverifybench 2023	23	SAT	0.73	1.54	3.71	1.39	13.3	5.53	6.23	1.91	-	-	9.11	2.75	✗
2026 Tllverifybench 2023	24	UNSAT	5.93	20.5	9.47	13.9	-	240	111	-	-	-	-	58.3	-
2026 Tllverifybench 2023	25	UNSAT	7.70	22.2	17.2	15.8	-	-	221	-	-	-	-	55.2	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Tllverifybench 2023	26	UNSAT	7.13	22.5	19.6	15.0	-	561	181	-	-	-	-	50.0	-
2026 Tllverifybench 2023	27	SAT	1.11	1.90	6.71	2.57	14.4	2.05	9.50	3.66	-	-	20.2	5.85	✗
2026 Tllverifybench 2023	28	UNSAT	7.54	34.7	15.8	15.5	-	441	160	-	-	-	-	71.4	-
2026 Tllverifybench 2023	29	UNSAT	7.55	34.5	15.2	15.4	-	382	159	-	-	-	-	70.5	-
2026 Tllverifybench 2023	30	SAT	1.62	2.43	11.7	4.66	15.3	3.49	14.5	6.49	-	-	43.1	9.11	✗
2026 Tllverifybench 2023	31	SAT	1.62	2.47	11.7	4.70	15.2	3.49	14.6	6.37	-	-	50.7	9.17	✗
2026 Traffic Signs Recognition 2023	0	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	1	SAT	1.07	3.17	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	2	SAT	0.85	3.14	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	3	SAT	0.80	3.11	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	4	SAT	0.76	3.10	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	5	SAT	316	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	6	SAT	0.78	3.22	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	7	SAT	0.78	3.12	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	8	SAT	0.76	3.16	17.4	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	9	SAT	0.75	3.12	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	10	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	11	SAT	0.87	3.13	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	12	SAT	0.81	3.16	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	13	SAT	0.79	3.09	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	14	SAT	0.77	3.16	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	15	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	16	SAT	3.36	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	17	SAT	1.68	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	18	SAT	1.32	12.8	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	19	SAT	1.19	11.1	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	20	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	21	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	22	SAT	3.97	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	23	SAT	2.73	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	24	SAT	1.95	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	25	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	26	SAT	246	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	27	SAT	3.44	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	28	SAT	2.23	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	29	SAT	1.76	91.9	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	30	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	31	SAT	4.54	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	32	SAT	2.71	94.2	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	33	SAT	2.28	13.1	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	34	SAT	1.84	12.4	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	35	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	36	SAT	4.10	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	37	SAT	3.31	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	38	SAT	2.46	13.1	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	39	SAT	2.09	12.6	-	-	-	-	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Traffic Signs Recognition 2023	40	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	41	SAT	5.51	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	42	SAT	3.21	-	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	43	SAT	2.53	12.9	-	-	-	-	-	-	-	-	-	-	-
2026 Traffic Signs Recognition 2023	44	SAT	2.27	39.7	-	-	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	0	UNSAT	9.22	34.8	34.8	46.1	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	1	UNSAT	9.15	34.7	34.7	46.6	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	2	UNSAT	9.20	34.9	35.9	46.7	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	3	UNSAT	9.22	34.8	35.6	46.7	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	4	UNSAT	9.15	34.8	35.2	46.3	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	5	UNSAT	9.29	35.2	37.0	46.2	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	6	UNSAT	9.25	34.8	35.9	46.5	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	7	UNSAT	9.31	35.1	37.6	47.1	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	8	UNSAT	12.9	35.8	41.7	50.0	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	9	UNSAT	9.23	34.8	36.7	46.0	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	10	UNSAT	9.38	35.0	37.4	46.3	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	11	UNSAT	12.3	36.3	42.6	49.3	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	12	UNSAT	14.2	34.9	44.6	50.6	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	13	UNSAT	16.5	35.6	48.5	53.0	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	14	UNSAT	26.3	36.3	58.7	62.5	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	15	UNSAT	1102	1059	-	-	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	16	UNSAT	1051	-	-	-	-	-	-	-	-	-	-	-	-
2026 Vggnet16 2022	17	UNSAT	1103	-	-	-	-	-	-	-	-	-	-	-	-
2026 Vit 2023	0	UNSAT	3.41	11.1	-	33.4	-	-	-	-	-	1.04	-	-	-
2026 Vit 2023	1	UNSAT	2.85	11.6	-	35.9	-	-	-	-	-	0.92	-	-	-
2026 Vit 2023	2	UNSAT	-	-	-	-	-	-	-	-	-	1.18	-	-	-
2026 Vit 2023	3	UNSAT	-	-	-	-	-	-	-	-	-	1.07	-	-	-
2026 Vit 2023	4	UNSAT	-	-	-	-	-	-	-	-	-	0.94	-	-	-
2026 Vit 2023	5	UNSAT	-	-	-	-	-	-	-	-	-	1.10	-	-	-
2026 Vit 2023	6	UNSAT	-	-	-	-	-	-	-	-	-	0.93	-	-	-
2026 Vit 2023	7	UNSAT	-	-	-	-	-	-	-	-	-	1.15	-	-	-
2026 Vit 2023	8	UNSAT	2.92	10.5	-	26.8	-	-	-	-	-	1.02	-	-	-
2026 Vit 2023	9	UNSAT	-	-	-	-	-	-	-	-	-	1.10	-	-	-
2026 Vit 2023	10	UNSAT	1.42	6.79	2.20	14.1	-	-	-	-	-	1.14	-	-	-
2026 Vit 2023	11	UNSAT	-	-	-	-	-	-	-	-	-	1.13	-	-	-
2026 Vit 2023	12	UNSAT	-	-	-	-	-	-	-	-	-	1.15	-	-	-
2026 Vit 2023	13	UNSAT	1.38	5.90	4.36	14.1	-	-	-	-	-	0.98	-	-	-
2026 Vit 2023	14	UNSAT	1.38	6.53	-	14.0	-	-	-	-	-	1.13	-	-	-
2026 Vit 2023	15	UNSAT	2.93	9.52	-	25.7	-	-	-	-	-	1.01	-	-	-
2026 Vit 2023	16	UNSAT	3.22	12.1	-	76.1	-	-	-	-	-	1.03	-	-	-
2026 Vit 2023	17	UNSAT	-	-	-	-	-	-	-	-	-	1.17	-	-	-
2026 Vit 2023	18	UNSAT	3.62	54.9	-	-	-	-	-	-	-	1.12	-	-	-
2026 Vit 2023	19	UNSAT	1.37	2.72	1.57	14.0	-	-	-	-	-	0.99	-	-	-
2026 Vit 2023	20	UNSAT	1.35	5.98	1.54	14.1	-	-	-	-	-	1.09	-	-	-
2026 Vit 2023	21	UNSAT	3.29	9.27	-	27.3	-	-	-	-	-	1.07	-	-	-
2026 Vit 2023	22	UNSAT	-	-	-	-	-	-	-	-	-	0.96	-	-	-

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Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Vit 2023	23	UNSAT	-	-	-	-	-	-	-	-	-	1.11	-	-	-
2026 Vit 2023	24	UNSAT	2.49	7.94	-	24.3	-	-	-	-	-	1.05	-	-	-
2026 Vit 2023	25	UNSAT	-	-	-	-	-	-	-	-	-	1.11	-	-	-
2026 Vit 2023	26	UNSAT	1.38	5.77	1.55	14.0	-	-	-	-	-	1.10	-	-	-
2026 Vit 2023	27	UNSAT	1.37	6.18	1.58	14.1	-	-	-	-	-	1.03	-	-	-
2026 Vit 2023	28	UNSAT	22.0	15.0	-	-	-	-	-	-	-	1.09	-	-	-
2026 Vit 2023	29	UNSAT	-	-	-	-	-	-	-	-	-	0.94	-	-	-
2026 Vit 2023	30	UNSAT	1.42	7.85	10.4	14.0	-	-	-	-	-	1.06	-	-	-
2026 Vit 2023	31	UNSAT	-	-	-	-	-	-	-	-	-	1.01	-	-	-
2026 Vit 2023	32	UNSAT	-	-	-	-	-	-	-	-	-	1.09	-	-	-
2026 Vit 2023	33	UNSAT	-	-	-	-	-	-	-	-	-	1.06	-	-	-
2026 Vit 2023	34	UNSAT	55.2	-	-	-	-	-	-	-	-	1.17	-	-	-
2026 Vit 2023	35	UNSAT	-	-	-	-	-	-	-	-	-	1.04	-	-	-
2026 Vit 2023	36	UNSAT	-	-	-	-	-	-	-	-	-	1.09	-	-	-
2026 Vit 2023	37	UNSAT	1.37	5.79	1.58	14.0	-	-	-	-	-	1.10	-	-	-
2026 Vit 2023	38	UNSAT	-	-	-	-	-	-	-	-	-	1.08	-	-	-
2026 Vit 2023	39	UNSAT	26.6	54.2	-	-	-	-	-	-	-	1.11	-	-	-
2026 Vit 2023	40	UNSAT	29.5	55.2	-	-	-	-	-	-	-	1.01	-	-	-
2026 Vit 2023	41	UNSAT	-	-	-	-	-	-	-	-	-	1.12	-	-	-
2026 Vit 2023	42	UNSAT	-	-	-	-	-	-	-	-	-	1.00	-	-	-
2026 Vit 2023	43	UNSAT	2.42	13.9	-	28.2	-	-	-	-	-	1.09	-	-	-
2026 Vit 2023	44	UNSAT	2.53	10.1	-	25.1	-	-	-	-	-	0.82	-	-	-
2026 Vit 2023	45	UNSAT	-	-	-	-	-	-	-	-	-	1.07	-	-	-
2026 Vit 2023	46	UNSAT	1.39	6.17	35.2	14.0	-	-	-	-	-	0.83	-	-	-
2026 Vit 2023	47	UNSAT	2.46	6.31	-	24.6	-	-	-	-	-	0.96	-	-	-
2026 Vit 2023	48	UNSAT	1.34	6.75	46.9	14.2	-	-	-	-	-	0.82	-	-	-
2026 Vit 2023	49	UNSAT	1.40	6.30	49.9	14.1	-	-	-	-	-	0.96	-	-	-
2026 Vit 2023	50	UNSAT	1.39	5.84	1.57	14.3	-	-	-	-	-	1.01	-	-	-
2026 Vit 2023	51	UNSAT	2.50	9.88	-	25.1	-	-	-	-	-	1.16	-	-	-
2026 Vit 2023	52	UNSAT	-	-	-	-	-	-	-	-	-	1.08	-	-	-
2026 Vit 2023	53	UNSAT	1.40	6.81	10.9	14.2	-	-	-	-	-	1.03	-	-	-
2026 Vit 2023	54	UNSAT	-	-	-	-	-	-	-	-	-	1.00	-	-	-
2026 Vit 2023	55	UNSAT	1.42	6.39	1.58	14.0	-	-	-	-	-	1.03	-	-	-
2026 Vit 2023	56	UNSAT	-	-	-	-	-	-	-	-	-	0.98	-	-	-
2026 Vit 2023	57	UNSAT	-	-	-	-	-	-	-	-	-	1.07	-	-	-
2026 Vit 2023	58	UNSAT	-	-	-	-	-	-	-	-	-	1.12	-	-	-
2026 Vit 2023	59	UNSAT	1.39	2.72	-	14.1	-	-	-	-	-	1.07	-	-	-
2026 Vit 2023	60	UNSAT	2.51	6.77	-	24.6	-	-	-	-	-	1.00	-	-	-
2026 Vit 2023	61	UNSAT	-	-	-	-	-	-	-	-	-	1.10	-	-	-
2026 Vit 2023	62	UNSAT	-	-	-	-	-	-	-	-	-	1.08	-	-	-
2026 Vit 2023	63	UNSAT	2.44	7.29	-	28.7	-	-	-	-	-	0.89	-	-	-
2026 Vit 2023	64	UNSAT	-	-	-	-	-	-	-	-	-	1.12	-	-	-
2026 Vit 2023	65	UNSAT	-	-	-	-	-	-	-	-	-	0.98	-	-	-
2026 Vit 2023	66	UNSAT	-	-	-	-	-	-	-	-	-	1.05	-	-	-
2026 Vit 2023	67	UNSAT	-	-	-	-	-	-	-	-	-	1.09	-	-	-
2026 Vit 2023	68	UNSAT	-	-	-	-	-	-	-	-	-	1.09	-	-	-
2026 Vit 2023	69	UNSAT	23.3	12.7	-	61.3	-	-	-	-	-	1.00	-	-	-

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Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Vit 2023	70	UNSAT	-	-	-	-	-	-	-	-	-	1.12	-	-	-
2026 Vit 2023	71	UNSAT	-	-	-	-	-	-	-	-	-	1.02	-	-	-
2026 Vit 2023	72	UNSAT	-	-	-	-	-	-	-	-	-	1.05	-	-	-
2026 Vit 2023	73	UNSAT	-	-	-	-	-	-	-	-	-	0.82	-	-	-
2026 Vit 2023	74	UNSAT	1.41	7.23	1.58	14.0	-	-	-	-	-	1.04	-	-	-
2026 Vit 2023	75	UNSAT	-	-	-	-	-	-	-	-	-	1.06	-	-	-
2026 Vit 2023	76	UNSAT	1.42	11.1	3.19	14.0	-	-	-	-	-	1.02	-	-	-
2026 Vit 2023	77	UNSAT	1.39	6.31	18.0	14.1	-	-	-	-	-	1.07	-	-	-
2026 Vit 2023	78	UNSAT	25.5	53.1	-	-	-	-	-	-	-	1.10	-	-	-
2026 Vit 2023	79	UNSAT	-	-	-	-	-	-	-	-	-	0.98	-	-	-
2026 Vit 2023	80	UNSAT	28.1	57.5	-	-	-	-	-	-	-	1.08	-	-	-
2026 Vit 2023	81	UNSAT	1.41	5.73	1.59	14.0	-	-	-	-	-	1.00	-	-	-
2026 Vit 2023	82	UNSAT	35.2	57.9	-	-	-	-	-	-	-	1.05	-	-	-
2026 Vit 2023	83	UNSAT	22.2	54.4	-	-	-	-	-	-	-	1.11	-	-	-
2026 Vit 2023	84	UNSAT	1.42	5.80	6.32	14.0	-	-	-	-	-	1.12	-	-	-
2026 Vit 2023	85	UNSAT	2.54	6.76	-	24.4	-	-	-	-	-	0.98	-	-	-
2026 Vit 2023	86	UNSAT	-	-	-	-	-	-	-	-	-	1.08	-	-	-
2026 Vit 2023	87	UNSAT	2.48	6.87	20.3	24.4	-	-	-	-	-	1.11	-	-	-
2026 Vit 2023	88	UNSAT	2.82	10.5	-	28.7	-	-	-	-	-	0.99	-	-	-
2026 Vit 2023	89	UNSAT	3.69	10.6	-	29.8	-	-	-	-	-	1.04	-	-	-
2026 Vit 2023	90	UNSAT	2.49	6.30	-	23.8	-	-	-	-	-	0.91	-	-	-
2026 Vit 2023	91	UNSAT	2.48	10.6	-	25.5	-	-	-	-	-	0.86	-	-	-
2026 Vit 2023	92	UNSAT	-	-	-	-	-	-	-	-	-	1.11	-	-	-
2026 Vit 2023	93	UNSAT	-	-	-	-	-	-	-	-	-	1.12	-	-	-
2026 Vit 2023	94	UNSAT	-	-	-	-	-	-	-	-	-	1.11	-	-	-
2026 Vit 2023	95	UNSAT	1.38	6.97	74.5	13.9	-	-	-	-	-	1.13	-	-	-
2026 Vit 2023	96	UNSAT	-	-	-	-	-	-	-	-	-	1.10	-	-	-
2026 Vit 2023	97	UNSAT	1.39	7.18	10.6	13.9	-	-	-	-	-	0.97	-	-	-
2026 Vit 2023	98	UNSAT	-	-	-	-	-	-	-	-	-	1.07	-	-	-
2026 Vit 2023	99	UNSAT	1.37	5.68	5.23	14.0	-	-	-	-	-	1.02	-	-	-
2026 Vit 2023	100	UNSAT	45.1	37.2	-	-	-	-	-	-	-	1.45	-	-	-
2026 Vit 2023	101	UNSAT	59.0	-	-	-	-	-	-	-	-	1.36	-	-	-
2026 Vit 2023	102	UNSAT	48.0	-	-	-	-	-	-	-	-	1.30	-	-	-
2026 Vit 2023	103	UNSAT	33.3	29.3	35.1	-	-	-	-	-	-	1.36	-	-	-
2026 Vit 2023	104	UNSAT	-	-	-	-	-	-	-	-	-	1.31	-	-	-
2026 Vit 2023	105	UNSAT	7.28	29.9	8.37	-	-	-	-	-	-	1.34	-	-	-
2026 Vit 2023	106	UNSAT	-	-	-	-	-	-	-	-	-	1.31	-	-	-
2026 Vit 2023	107	UNSAT	-	-	-	-	-	-	-	-	-	1.30	-	-	-
2026 Vit 2023	108	UNSAT	-	-	-	-	-	-	-	-	-	1.20	-	-	-
2026 Vit 2023	109	UNSAT	36.2	31.5	21.4	-	-	-	-	-	-	1.28	-	-	-
2026 Vit 2023	110	UNSAT	4.70	28.9	7.42	-	-	-	-	-	-	1.34	-	-	-
2026 Vit 2023	111	UNSAT	47.3	34.5	-	-	-	-	-	-	-	1.35	-	-	-
2026 Vit 2023	112	UNSAT	-	-	-	-	-	-	-	-	-	1.35	-	-	-
2026 Vit 2023	113	UNSAT	1.93	10.1	3.07	15.9	-	-	-	45.4	-	1.36	-	-	-
2026 Vit 2023	114	UNSAT	-	-	-	-	-	-	-	-	-	1.44	-	-	-
2026 Vit 2023	115	UNSAT	3.83	11.0	3.05	-	-	-	-	42.0	-	1.00	-	-	-
2026 Vit 2023	116	UNSAT	34.1	31.2	65.4	-	-	-	-	-	-	1.02	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Vit 2023	117	UNSAT	24.9	29.7	53.5	-	-	-	-	-	-	1.08	-	-	-
2026 Vit 2023	118	UNSAT	-	-	-	-	-	-	-	-	-	1.47	-	-	-
2026 Vit 2023	119	UNSAT	-	-	-	-	-	-	-	-	-	1.36	-	-	-
2026 Vit 2023	120	UNSAT	45.0	33.5	-	-	-	-	-	-	-	1.43	-	-	-
2026 Vit 2023	121	UNSAT	-	-	-	-	-	-	-	-	-	1.35	-	-	-
2026 Vit 2023	122	UNSAT	-	-	-	-	-	-	-	-	-	1.30	-	-	-
2026 Vit 2023	123	UNSAT	41.2	31.8	-	-	-	-	-	-	-	1.33	-	-	-
2026 Vit 2023	124	UNSAT	1.94	3.20	3.06	16.0	-	-	-	43.4	-	1.23	-	-	-
2026 Vit 2023	125	UNSAT	38.6	53.0	43.2	-	-	-	-	-	-	1.38	-	-	-
2026 Vit 2023	126	UNSAT	90.3	-	-	-	-	-	-	-	-	1.25	-	-	-
2026 Vit 2023	127	UNSAT	-	-	-	-	-	-	-	-	-	1.31	-	-	-
2026 Vit 2023	128	UNSAT	33.4	35.4	50.7	-	-	-	-	-	-	1.28	-	-	-
2026 Vit 2023	129	UNSAT	-	-	-	-	-	-	-	-	-	1.39	-	-	-
2026 Vit 2023	130	UNSAT	-	-	-	-	-	-	-	-	-	1.36	-	-	-
2026 Vit 2023	131	UNSAT	1.94	21.6	3.07	15.9	-	-	-	40.3	-	1.33	-	-	-
2026 Vit 2023	132	UNSAT	-	-	-	-	-	-	-	-	-	1.34	-	-	-
2026 Vit 2023	133	UNSAT	36.7	31.4	71.4	-	-	-	-	-	-	1.42	-	-	-
2026 Vit 2023	134	UNSAT	-	-	-	-	-	-	-	-	-	1.36	-	-	-
2026 Vit 2023	135	UNSAT	-	-	-	-	-	-	-	-	-	1.25	-	-	-
2026 Vit 2023	136	UNSAT	1.94	21.5	3.03	15.9	-	-	-	45.8	-	1.38	-	-	-
2026 Vit 2023	137	UNSAT	-	-	-	-	-	-	-	-	-	1.01	-	-	-
2026 Vit 2023	138	UNSAT	27.3	32.0	-	-	-	-	-	-	-	1.31	-	-	-
2026 Vit 2023	139	UNSAT	1.95	28.2	16.0	16.0	-	-	-	40.8	-	1.35	-	-	-
2026 Vit 2023	140	UNSAT	1.93	10.2	3.13	15.9	-	-	-	40.2	-	1.39	-	-	-
2026 Vit 2023	141	UNSAT	1.94	10.2	3.06	15.9	-	-	-	40.5	-	1.23	-	-	-
2026 Vit 2023	142	UNSAT	34.8	-	67.6	-	-	-	-	-	-	1.38	-	-	-
2026 Vit 2023	143	UNSAT	32.9	28.4	7.62	98.6	-	-	-	-	-	1.34	-	-	-
2026 Vit 2023	144	UNSAT	4.71	31.2	11.1	-	-	-	-	-	-	1.33	-	-	-
2026 Vit 2023	145	UNSAT	3.87	28.4	7.81	-	-	-	-	47.7	-	1.25	-	-	-
2026 Vit 2023	146	UNSAT	-	-	-	-	-	-	-	-	-	1.43	-	-	-
2026 Vit 2023	147	UNSAT	3.87	10.1	2.99	-	-	-	-	45.3	-	1.36	-	-	-
2026 Vit 2023	148	UNSAT	34.7	29.9	26.0	-	-	-	-	-	-	1.35	-	-	-
2026 Vit 2023	149	UNSAT	1.94	10.1	3.01	16.1	-	-	-	43.6	-	1.30	-	-	-
2026 Vit 2023	150	UNSAT	-	-	-	-	-	-	-	-	-	1.26	-	-	-
2026 Vit 2023	151	UNSAT	-	-	-	-	-	-	-	-	-	1.26	-	-	-
2026 Vit 2023	152	UNSAT	1.95	10.9	3.01	15.9	-	-	-	44.9	-	1.38	-	-	-
2026 Vit 2023	153	UNSAT	41.1	33.0	-	-	-	-	-	-	-	1.28	-	-	-
2026 Vit 2023	154	UNSAT	-	-	-	-	-	-	-	-	-	1.43	-	-	-
2026 Vit 2023	155	UNSAT	24.0	31.9	17.0	-	-	-	-	-	-	1.28	-	-	-
2026 Vit 2023	156	UNSAT	-	-	-	-	-	-	-	-	-	1.36	-	-	-
2026 Vit 2023	157	UNSAT	-	-	-	-	-	-	-	-	-	1.22	-	-	-
2026 Vit 2023	158	UNSAT	55.0	45.0	-	-	-	-	-	-	-	1.34	-	-	-
2026 Vit 2023	159	UNSAT	57.3	-	-	-	-	-	-	-	-	1.37	-	-	-
2026 Vit 2023	160	UNSAT	94.6	-	-	-	-	-	-	-	-	1.33	-	-	-
2026 Vit 2023	161	UNSAT	42.7	35.1	-	-	-	-	-	-	-	1.37	-	-	-
2026 Vit 2023	162	UNSAT	34.3	32.0	16.3	-	-	-	-	-	-	1.20	-	-	-
2026 Vit 2023	163	UNSAT	4.57	21.5	3.03	-	-	-	-	47.4	-	1.32	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Vit 2023	164	UNSAT	1.83	11.0	3.08	16.0	-	-	-	44.8	-	1.30	-	-	-
2026 Vit 2023	165	UNSAT	3.75	10.2	3.05	-	-	-	-	46.5	-	1.43	-	-	-
2026 Vit 2023	166	UNSAT	69.1	-	-	-	-	-	-	-	-	1.37	-	-	-
2026 Vit 2023	167	UNSAT	4.62	32.0	96.2	-	-	-	-	-	-	1.41	-	-	-
2026 Vit 2023	168	UNSAT	1.82	10.1	3.08	16.0	-	-	-	46.6	-	1.39	-	-	-
2026 Vit 2023	169	UNSAT	35.9	31.8	27.7	-	-	-	-	-	-	1.32	-	-	-
2026 Vit 2023	170	UNSAT	20.5	28.9	21.4	-	-	-	-	-	-	1.16	-	-	-
2026 Vit 2023	171	UNSAT	60.8	71.7	-	-	-	-	-	-	-	1.29	-	-	-
2026 Vit 2023	172	UNSAT	4.59	28.3	3.86	98.5	-	-	-	-	-	1.15	-	-	-
2026 Vit 2023	173	UNSAT	6.30	29.3	9.48	-	-	-	-	-	-	1.32	-	-	-
2026 Vit 2023	174	UNSAT	3.76	28.1	3.09	98.8	-	-	-	44.9	-	1.39	-	-	-
2026 Vit 2023	175	UNSAT	70.8	-	-	-	-	-	-	-	-	1.36	-	-	-
2026 Vit 2023	176	UNSAT	43.7	-	-	-	-	-	-	-	-	1.36	-	-	-
2026 Vit 2023	177	UNSAT	3.70	10.2	3.06	98.5	-	-	-	41.8	-	1.40	-	-	-
2026 Vit 2023	178	UNSAT	-	-	-	-	-	-	-	-	-	1.41	-	-	-
2026 Vit 2023	179	UNSAT	4.57	21.6	7.44	-	-	-	-	-	-	1.17	-	-	-
2026 Vit 2023	180	UNSAT	28.0	28.4	11.7	99.4	-	-	-	-	-	1.36	-	-	-
2026 Vit 2023	181	UNSAT	83.8	-	-	-	-	-	-	-	-	1.25	-	-	-
2026 Vit 2023	182	UNSAT	54.4	-	-	-	-	-	-	-	-	1.29	-	-	-
2026 Vit 2023	183	UNSAT	37.0	32.1	-	-	-	-	-	-	-	1.32	-	-	-
2026 Vit 2023	184	UNSAT	-	-	-	-	-	-	-	-	-	1.46	-	-	-
2026 Vit 2023	185	UNSAT	-	-	-	-	-	-	-	-	-	1.37	-	-	-
2026 Vit 2023	186	UNSAT	39.8	31.4	-	-	-	-	-	-	-	1.25	-	-	-
2026 Vit 2023	187	UNSAT	-	-	-	-	-	-	-	-	-	1.38	-	-	-
2026 Vit 2023	188	UNSAT	33.4	29.3	7.02	-	-	-	-	-	-	1.27	-	-	-
2026 Vit 2023	189	UNSAT	1.84	10.2	3.12	16.0	-	-	-	44.4	-	1.31	-	-	-
2026 Vit 2023	190	UNSAT	-	-	-	-	-	-	-	-	-	1.24	-	-	-
2026 Vit 2023	191	UNSAT	3.73	21.6	7.42	99.4	-	-	-	-	-	1.36	-	-	-
2026 Vit 2023	192	UNSAT	-	-	-	-	-	-	-	-	-	1.33	-	-	-
2026 Vit 2023	193	UNSAT	33.4	28.9	21.7	-	-	-	-	-	-	1.26	-	-	-
2026 Vit 2023	194	UNSAT	4.57	29.9	18.4	-	-	-	-	-	-	1.32	-	-	-
2026 Vit 2023	195	UNSAT	39.4	37.2	-	-	-	-	-	-	-	1.30	-	-	-
2026 Vit 2023	196	UNSAT	-	-	-	-	-	-	-	-	-	1.34	-	-	-
2026 Vit 2023	197	UNSAT	39.4	30.7	-	-	-	-	-	-	-	1.25	-	-	-
2026 Vit 2023	198	UNSAT	1.80	28.5	3.07	16.0	-	-	-	40.0	-	1.36	-	-	-
2026 Vit 2023	199	UNSAT	36.6	30.7	44.9	-	-	-	-	-	-	1.21	-	-	-
2026 Yolo 2023	0	UNSAT	2.19	131	-	2.98	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	1	UNSAT	2.24	27.5	2.17	3.08	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	2	UNSAT	4.55	109	-	51.9	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	3	UNSAT	2.19	90.2	2.29	2.93	-	-	-	-	131	-	-	-	-
2026 Yolo 2023	4	UNSAT	2.19	99.6	2.17	2.78	-	-	-	-	129	-	-	-	-
2026 Yolo 2023	5	UNSAT	2.22	39.9	56.2	2.81	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	6	UNSAT	4.06	103	-	52.2	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	7	UNSAT	2.18	75.3	2.09	2.75	-	-	-	-	127	-	-	-	-
2026 Yolo 2023	8	UNSAT	2.17	29.1	2.15	2.83	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	9	UNSAT	2.19	83.4	2.27	2.83	-	-	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Yolo 2023	10	UNSAT	2.18	105	2.32	2.84	-	-	-	-	131	-	-	-	-
2026 Yolo 2023	11	UNSAT	2.19	27.9	2.14	2.93	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	12	UNSAT	2.20	97.6	41.5	2.91	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	13	UNSAT	2.21	45.1	1.97	2.95	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	14	UNSAT	2.20	38.2	2.43	2.82	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	15	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	16	UNSAT	2.21	26.6	2.10	2.90	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	17	UNSAT	2.20	28.9	2.13	2.76	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	18	UNSAT	2.17	58.7	2.16	2.73	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	19	UNSAT	2.18	111	29.6	2.81	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	20	UNSAT	2.18	109	6.13	2.80	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	21	UNSAT	2.20	38.9	2.37	2.81	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	22	UNSAT	5.36	148	-	76.5	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	23	UNSAT	2.22	22.9	2.09	2.73	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	24	UNSAT	2.20	117	-	2.75	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	25	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	26	UNSAT	2.28	36.2	2.30	2.83	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	27	UNSAT	2.24	37.5	2.36	2.81	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	28	UNSAT	4.11	97.9	-	6.52	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	29	UNSAT	2.22	25.0	2.03	2.79	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	30	UNSAT	6.63	-	-	-	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	31	UNSAT	2.19	111	277	2.88	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	32	UNSAT	2.23	49.3	2.03	2.83	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	33	UNSAT	2.19	30.8	2.24	2.86	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	34	UNSAT	2.24	78.3	282	2.87	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	35	UNSAT	2.20	33.0	28.0	2.87	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	36	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	37	UNSAT	2.19	27.5	2.17	2.90	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	38	UNSAT	2.19	56.0	2.01	2.73	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	39	UNSAT	2.18	30.7	2.29	2.90	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	40	UNSAT	5.57	-	-	-	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	41	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	42	UNSAT	2.20	105	2.31	2.83	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	43	UNSAT	2.20	27.9	2.17	2.79	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	44	UNSAT	2.24	98.7	-	2.79	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	45	UNSAT	2.20	96.1	-	2.82	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	46	UNSAT	2.18	52.4	2.02	2.73	-	-	-	-	116	-	-	-	-
2026 Yolo 2023	47	UNSAT	2.20	38.7	-	2.84	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	48	UNSAT	2.20	35.4	2.42	2.84	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	49	UNSAT	2.18	25.0	2.03	2.78	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	50	UNSAT	2.19	133	2.44	2.83	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	51	UNSAT	2.19	39.2	2.38	2.90	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	52	UNSAT	2.19	86.2	2.26	2.82	-	-	-	-	127	-	-	-	-
2026 Yolo 2023	53	UNSAT	2.21	29.1	2.11	2.88	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	54	UNSAT	2.20	31.5	-	2.87	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	55	UNSAT	3.93	99.2	-	8.87	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	56	UNSAT	2.23	26.6	2.19	2.95	-	-	-	-	-	-	-	-	-

Table 46: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	α-β-C	vibecheck	PyRAT	NSAT	NNV	CORA	bright	n2v	SSimp	act	NNen	SB	agate
2026 Yolo 2023	57	UNSAT	2.17	30.5	2.20	2.76	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	58	UNSAT	2.19	27.5	2.18	2.79	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	59	UNSAT	2.23	31.3	2.15	2.78	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	60	UNSAT	2.19	33.2	2.24	2.80	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	61	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	62	UNSAT	2.22	117	2.33	2.85	-	-	-	-	137	-	-	-	-
2026 Yolo 2023	63	UNSAT	2.19	104	-	2.80	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	64	UNSAT	4.06	96.8	-	6.54	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	65	UNSAT	2.21	21.3	2.04	2.75	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	66	UNSAT	2.22	126	40.5	2.75	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	67	UNSAT	2.20	82.7	2.14	2.81	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	68	UNSAT	2.20	35.1	2.35	2.78	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	69	?	-	-	-	-	-	-	-	-	-	-	-	-	-
2026 Yolo 2023	70	UNSAT	2.21	78.5	2.11	2.79	-	-	-	-	124	-	-	-	-
2026 Yolo 2023	71	UNSAT	4.80	147	-	67.7	-	-	-	-	-	-	-	-	-