

# The Fifth International Verification of Neural Networks Competition (VNN-COMP 2024): Summary and Results

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## Abstract

This report summarizes the fifth International Verification of Neural Networks Competition (VNN-COMP 2024), held as a part of the 6th Workshop on Formal Methods for ML-Enabled Autonomous Systems (FoMLAS) that was colocated with the 35th International Conference on Computer-Aided Verification (CAV). 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 Total Score

Table 1: Overall Score

#	Tool	Score
1	$\alpha$ - $\beta$ -CROWN	1200.0
2	PyRAT	1000.8
3	Marabou	751.0
4	nnenum	572.5
5	NNV	530.0
6	NeVer2	262.3
7	CORA	251.7
8	NeuralSAT	0

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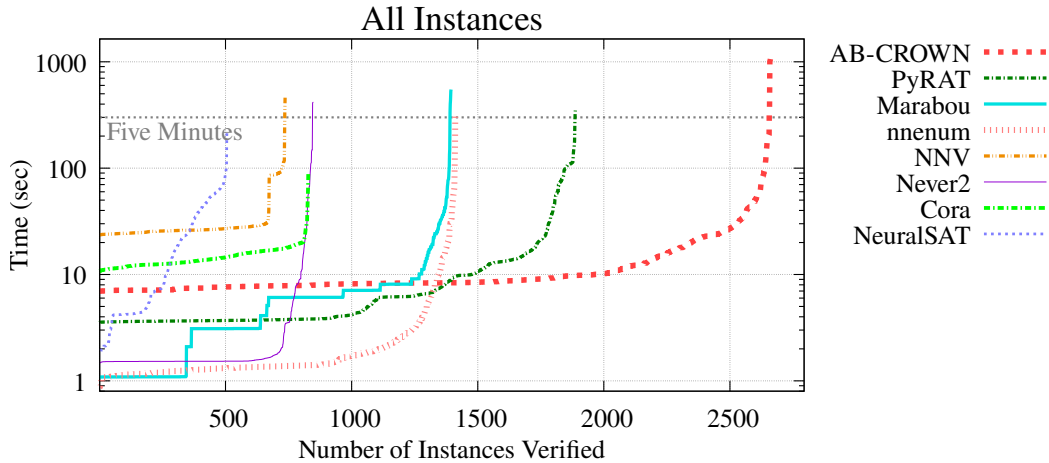


Figure 1: Cactus Plot for All Instances.

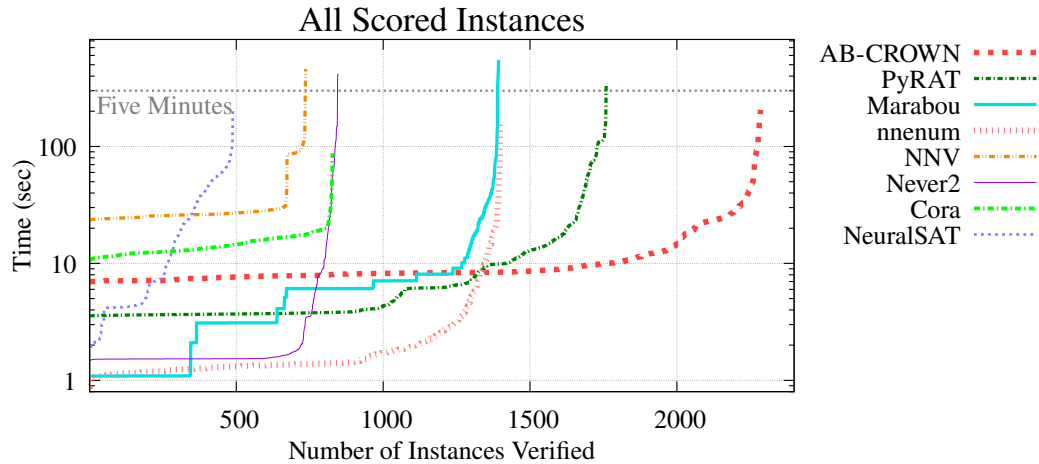


Figure 2: Cactus Plot for All Scored Instances.

## 2 Scored Benchmarks

Table 2: Benchmark 2024-acasxu-2023

#	Tool	Verified	Falsified	Fastest	Penalty Points	Score	Solved
1	$\alpha$ - $\beta$ -CROWN	139	47	0	0	1860	100.0%
2	nnenum	139	46	0	0	1850	99.5%
3	PyRAT	137	47	0	0	1840	98.9%
4	Marabou	134	45	0	1	1640	96.2%
5	NeVer2	121	40	0	0	1610	86.6%
6	NNV	70	27	0	0	970	52.2%
7	CORA	134	7	0	36	-3990	75.8%
8	NeuralSAT	138	0	0	46	-5520	74.2%

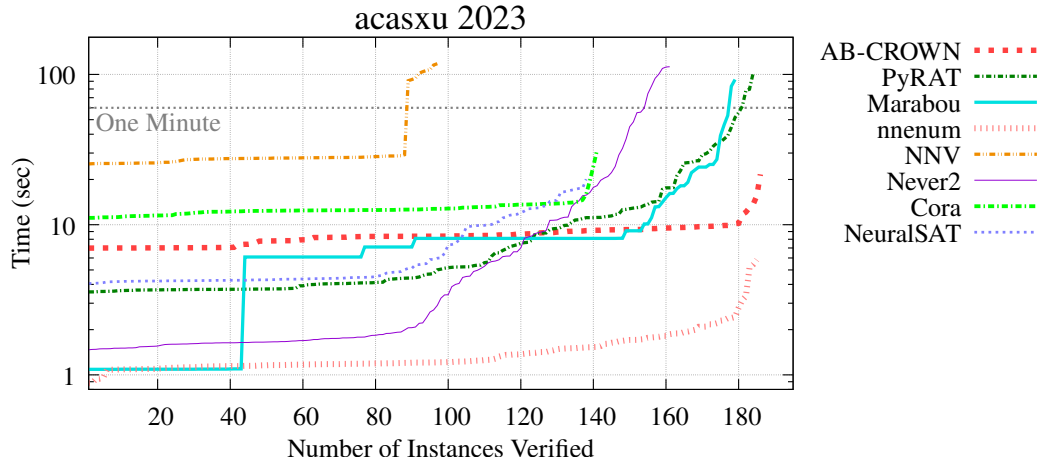


Figure 3: Cactus Plot for acasxu 2023.

Table 3: Benchmark 2024-cgan-2023

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	PyRAT	8	13	0	0	210	100.0	100.0%
2	$\alpha$ - $\beta$ -CROWN	8	13	0	0	210	100.0	100.0%
3	nnenum	6	11	0	0	170	81.0	81.0%
4	NNV	6	11	0	0	170	81.0	81.0%
5	Marabou	0	13	0	0	130	61.9	61.9%
6	NeuralSAT	8	0	0	11	-1570	0	38.1%

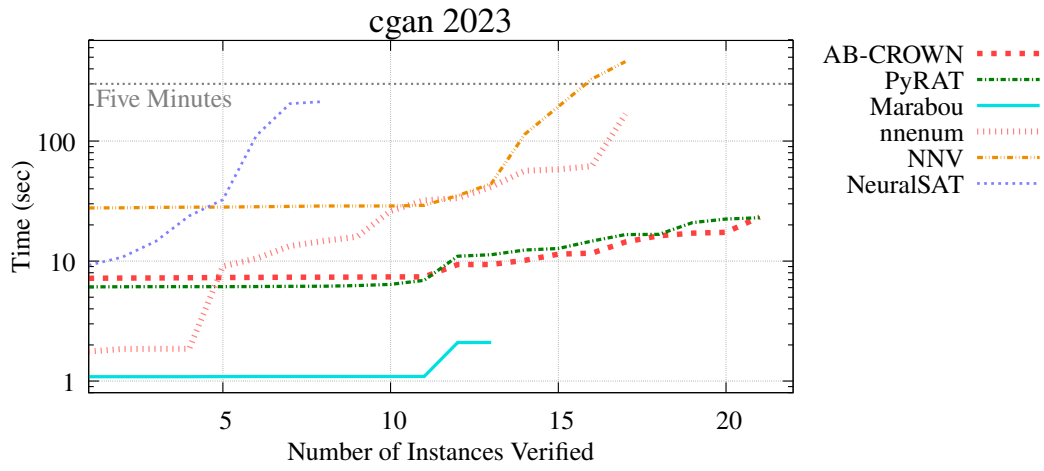


Figure 4: Cactus Plot for cgan 2023.

Table 4: Benchmark 2024-cifar100

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	$\alpha$ - $\beta$ -CROWN	117	32	0	0	1490	100.0	74.5%
2	PyRAT	67	25	0	0	920	61.7	46.0%
3	Marabou	0	30	0	0	300	20.1	15.0%
4	NeuralSAT	89	0	0	23	-2560	0	44.5%

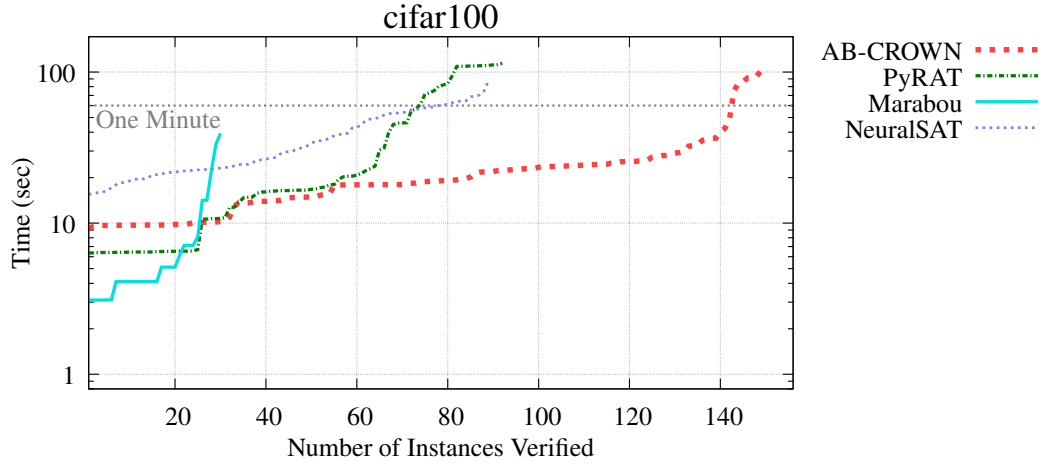


Figure 5: Cactus Plot for cifar100.

Table 5: Benchmark 2024-collins-rul-cnn-2023

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	nnenum	30	32	0	0	620	100.0	100.0%
2	NNV	30	32	0	0	620	100.0	100.0%
3	Marabou	30	32	0	0	620	100.0	100.0%
4	$\alpha$ - $\beta$ -CROWN	30	32	0	0	620	100.0	100.0%
5	PyRAT	30	28	0	0	580	93.5	93.5%
6	CORA	0	19	0	11	-1460	0	30.6%
7	NeuralSAT	30	0	0	32	-4500	0	48.4%

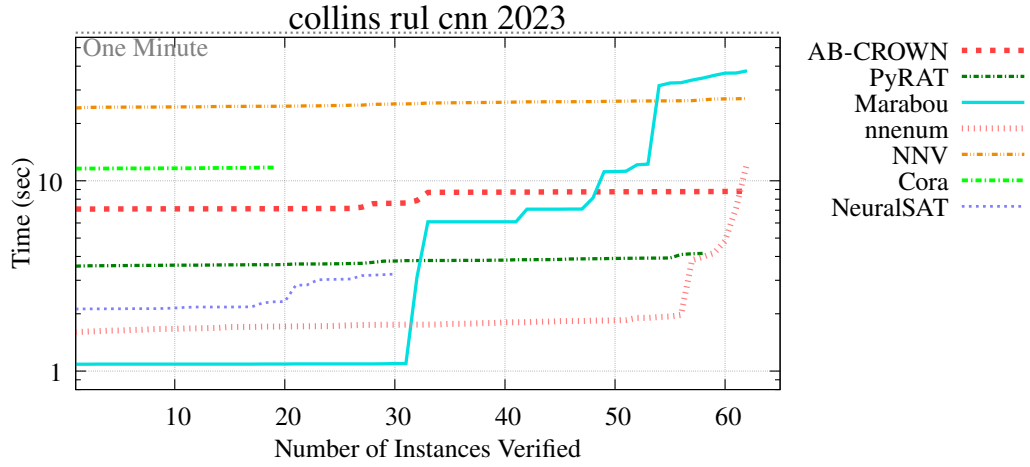


Figure 6: Cactus Plot for collins rul cnn 2023.

Table 6: Benchmark 2024-cora

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	$\alpha$ - $\beta$ -CROWN	24	134	0	0	1580	100.0	87.8%
2	Marabou	22	134	0	0	1560	98.7	86.7%
3	PyRAT	22	128	0	0	1500	94.9	83.3%
4	NNV	15	47	0	0	620	39.2	34.4%
5	NeVer2	17	11	0	0	280	17.7	15.6%
6	nnenum	20	6	0	0	260	16.5	14.4%
7	CORA	21	5	0	54	-7840	0	14.4%
8	NeuralSAT	23	0	0	134	-19870	0	12.8%

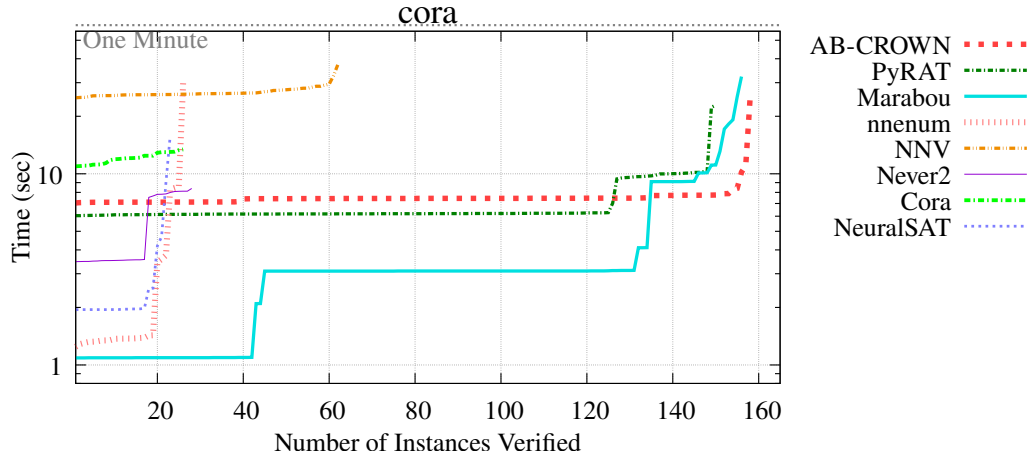


Figure 7: Cactus Plot for cora.



Table 7: Benchmark 2024-dist-shift-2023

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	PyRAT	63	8	0	0	710	100.0	98.6%
2	CORA	63	8	0	0	710	100.0	98.6%
3	$\alpha$ - $\beta$ -CROWN	63	8	0	0	710	100.0	98.6%
4	Marabou	62	7	0	0	690	97.2	95.8%
5	NNV	51	5	0	0	560	78.9	77.8%

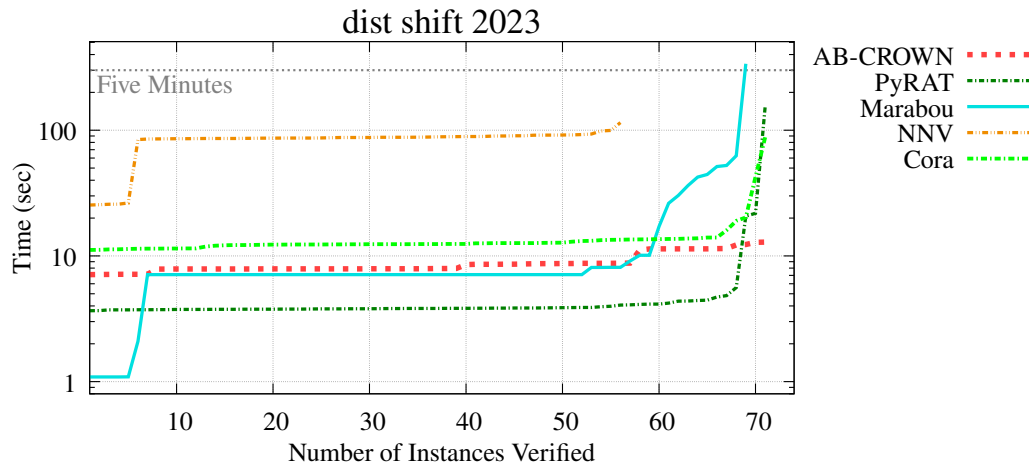


Figure 8: Cactus Plot for dist shift 2023.

Table 8: Benchmark 2024-linearizenn

#	Tool	Verified	Falsified	Fastest	Penalty Points	Score	Solved
1	PyRAT	59	1	0	0	600	100.0
2	Marabou	59	1	0	0	600	100.0
3	$\alpha$ - $\beta$ -CROWN	59	1	0	0	600	100.0
4	nnenum	59	0	0	1	440	73.3

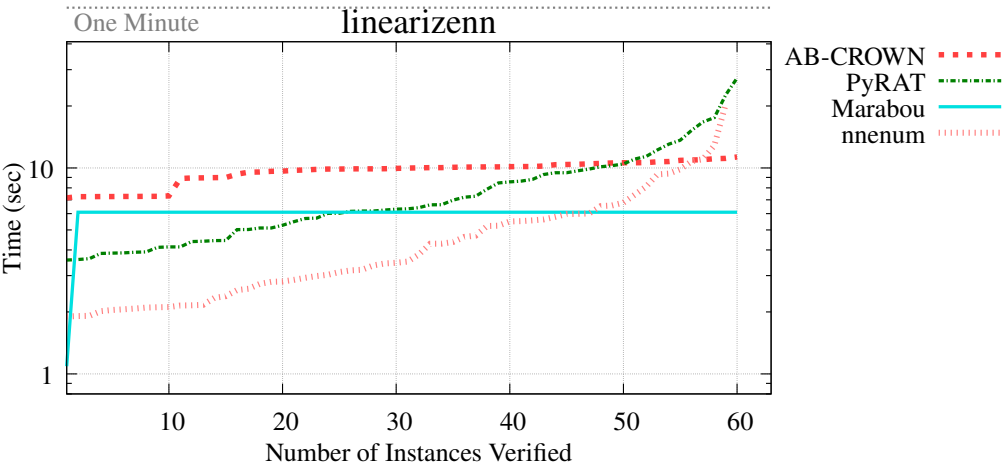


Figure 9: Cactus Plot for linearizenn.

Table 9: Benchmark 2024-metaroom-2023

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	$\alpha$ - $\beta$ -CROWN	91	7	0	0	980	100.0	98.0%
2	PyRAT	91	6	0	0	970	99.0	97.0%
3	NNV	90	2	0	0	920	93.9	92.0%
4	Marabou	46	7	0	0	530	54.1	53.0%
5	nenum	44	2	0	0	460	46.9	46.0%
6	NeuralSAT	91	0	0	7	-140	0	91.0%

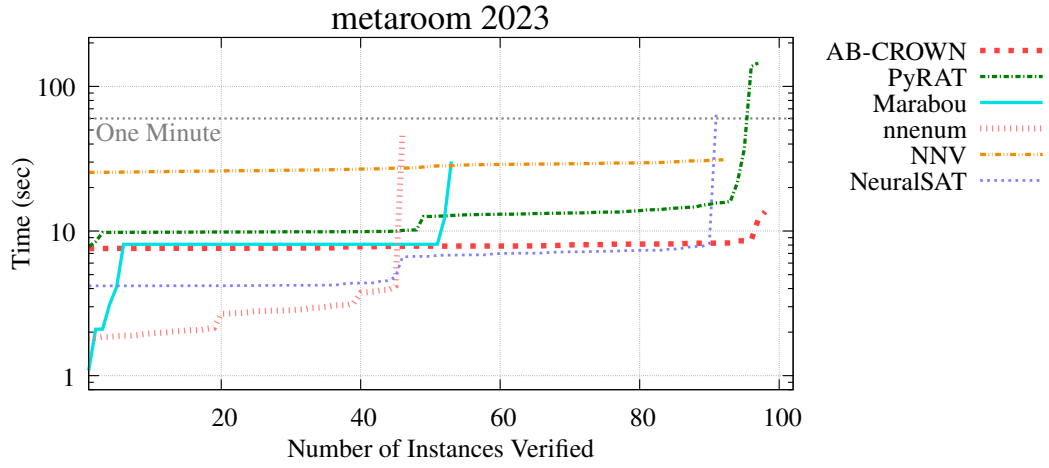


Figure 10: Cactus Plot for metaroom 2023.

Table 10: Benchmark 2024-nn4sys-2023

#	Tool	Verified	Falsified	Fastest	Penalty Points	Score	Solved
1	$\alpha$ - $\beta$ -CROWN	194	0	0	0	1940	100.0%
2	PyRAT	53	0	0	0	530	27.3%
3	Marabou	24	0	0	0	240	12.4%
4	nnenum	22	0	0	0	220	11.3%
5	CORA	2	0	0	0	20	1.0%

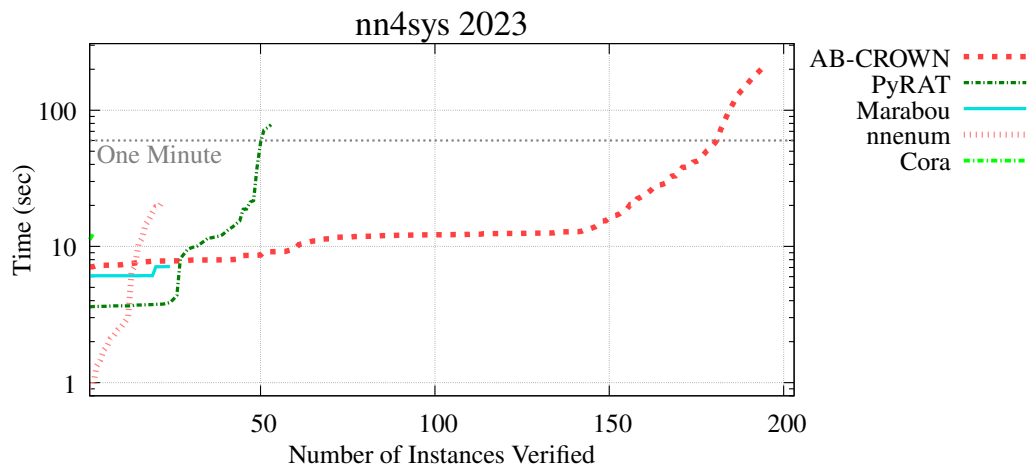


Figure 11: Cactus Plot for nn4sys 2023.

Table 11: Benchmark 2024-safenlp

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	$\alpha$ - $\beta$ -CROWN	421	659	0	0	10800	100.0	100.0%
2	nnenum	321	642	0	1	9480	87.8	89.2%
3	PyRAT	277	586	0	0	8630	79.9	79.9%
4	NeVer2	161	466	0	0	6270	58.1	58.1%
5	CORA	266	269	0	0	5350	49.5	49.5%
6	NNV	166	165	0	0	3310	30.6	30.6%
7	Marabou	300	375	0	402	-53550	0	62.5%

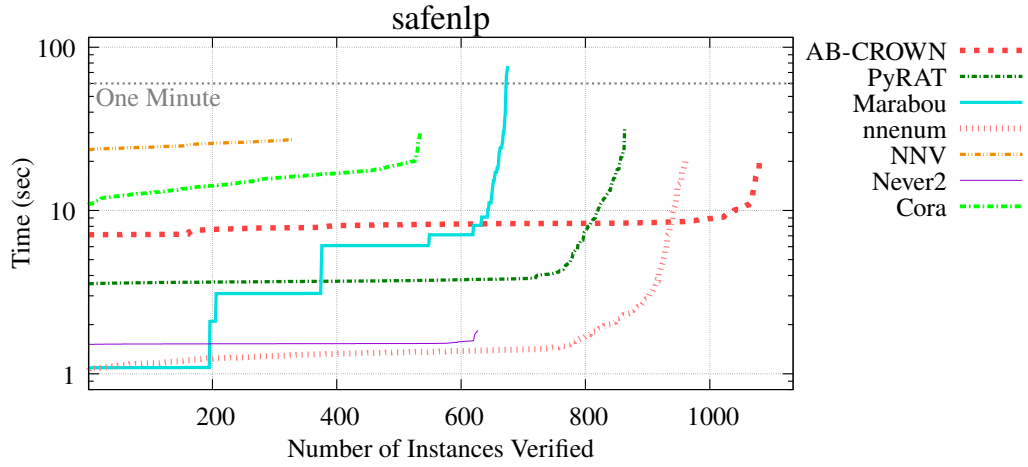


Figure 12: Cactus Plot for safenlp.

Table 12: Benchmark 2024-`tinyimagenet`

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	$\alpha$ - $\beta$ -CROWN	131	43	0	0	1740	100.0	87.0%
2	PyRAT	48	31	0	0	790	45.4	39.5%
3	Marabou	0	43	0	0	430	24.7	21.5%
4	NNV	0	2	0	0	20	1.1	1.0%
5	CORA	0	2	0	0	20	1.1	1.0%
6	NeuralSAT	95	0	0	11	-700	0	47.5%

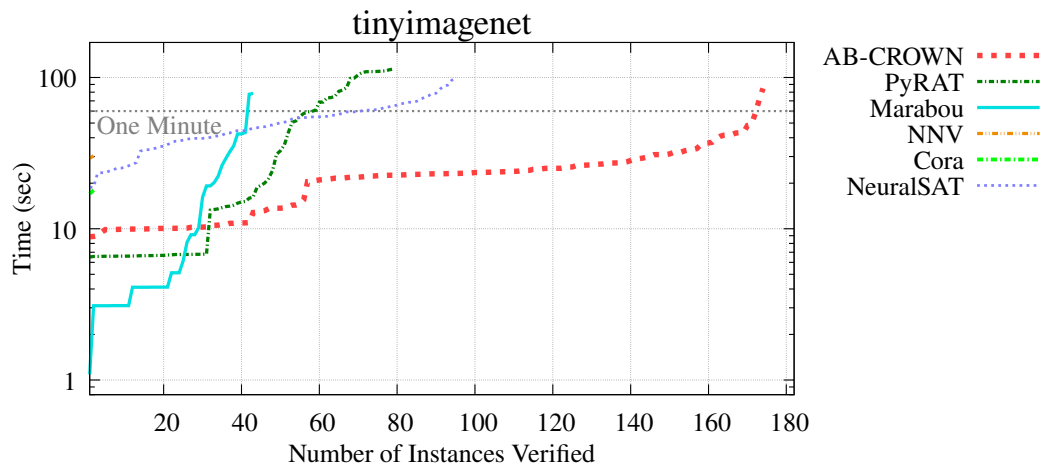


Figure 13: Cactus Plot for `tinyimagenet`.

Table 13: Benchmark 2024-tllverifybench-2023

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	PyRAT	15	17	0	0	320	100.0	100.0%
2	NeVer2	23	9	0	0	320	100.0	100.0%
3	CORA	15	17	0	0	320	100.0	100.0%
4	$\alpha$ - $\beta$ -CROWN	15	17	0	0	320	100.0	100.0%
5	Marabou	13	17	0	0	300	93.8	93.8%
6	nnenum	2	16	0	0	180	56.2	56.2%
7	NNV	0	17	0	0	170	53.1	53.1%
8	NeuralSAT	15	0	0	17	-2400	0	46.9%

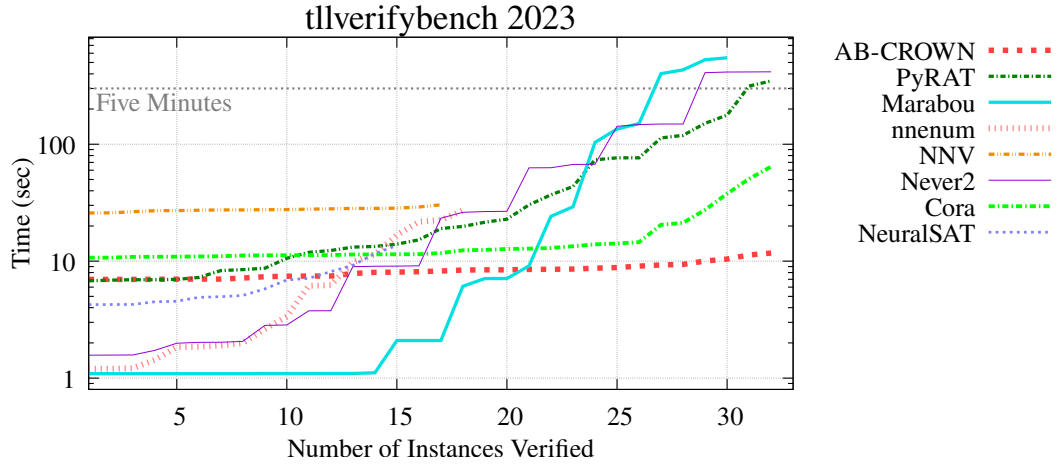


Figure 14: Cactus Plot for tllverifybench 2023.

### **3    Unscored Benchmarks**



Table 14: Benchmark 2024-cctsdbs-yolo-2023

#	Tool	Verified	Falsified	Fastest	Penalty Points	Score	Solved
1	$\alpha$ - $\beta$ -CROWN	11	28	0	0	390	100.0 100.0%
2	PyRAT	0	2	0	0	20	5.1 5.1%

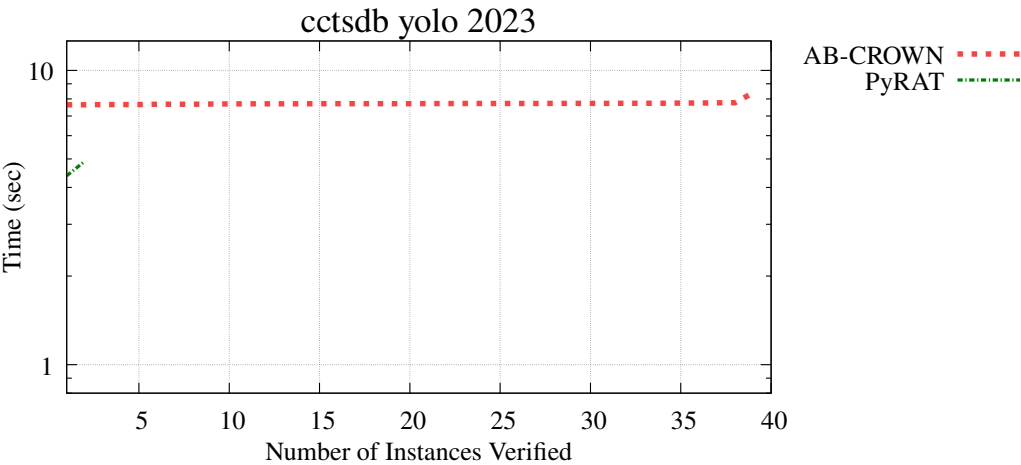


Figure 15: Cactus Plot for cctsdbs yolo 2023.

Table 15: Benchmark 2024-collins-aerospace-benchmark

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	PyRAT	0	6	0	0	60	100.0	100.0%
2	$\alpha$ - $\beta$ -CROWN	0	6	0	0	60	100.0	100.0%

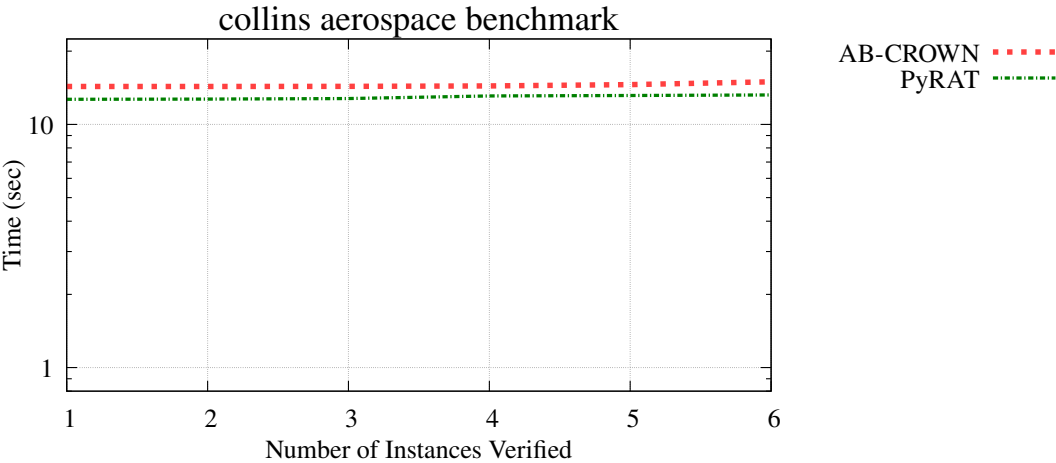


Figure 16: Cactus Plot for collins aerospace benchmark.

Table 16: Benchmark 2024-`lsnc`

#	Tool	Verified	Falsified	Fastest	Penalty Points	Score	Solved
1	$\alpha$ - $\beta$ -CROWN	40	0	0	0	400	100.0 100.0%
2	PyRAT	15	0	0	0	150	37.5 37.5%

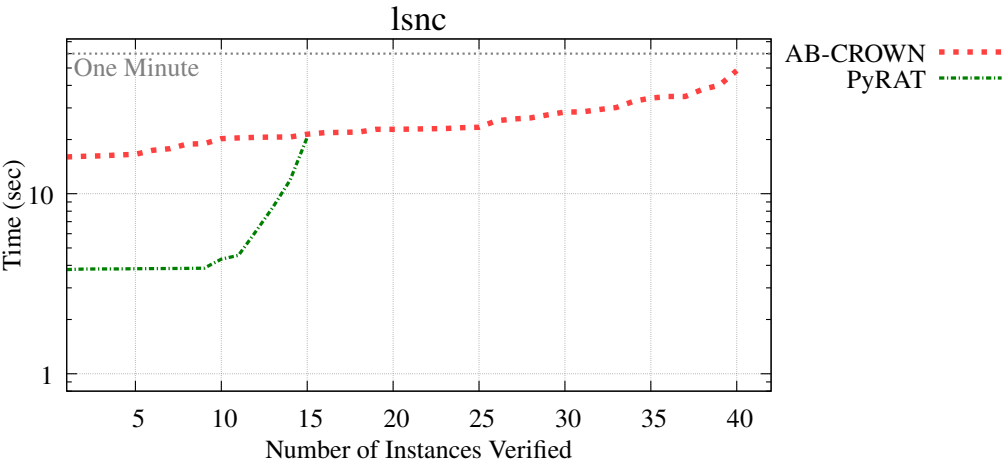


Figure 17: Cactus Plot for `lsnc`.

Table 17: Benchmark 2024-ml4acopf-2023

#	Tool	Verified	Falsified	Fastest	Penalty Points	Score	Solved
1	$\alpha$ - $\beta$ -CROWN	22	0	0	0	220	100.0 95.7%
2	PyRAT	15	0	0	0	150	68.2 65.2%

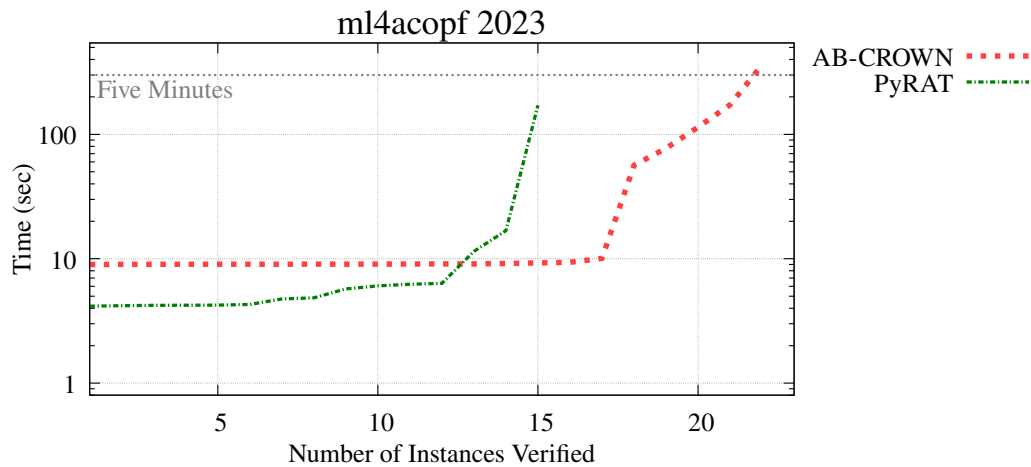


Figure 18: Cactus Plot for ml4acopf 2023.

Table 18: Benchmark 2024-ml4acopf-2024

#	Tool	Verified	Falsified	Fastest	Penalty Points	Score	Solved
1	$\alpha$ - $\beta$ -CROWN	59	3	0	0	620	100.0 89.9%
2	PyRAT	29	3	0	0	320	51.6 46.4%

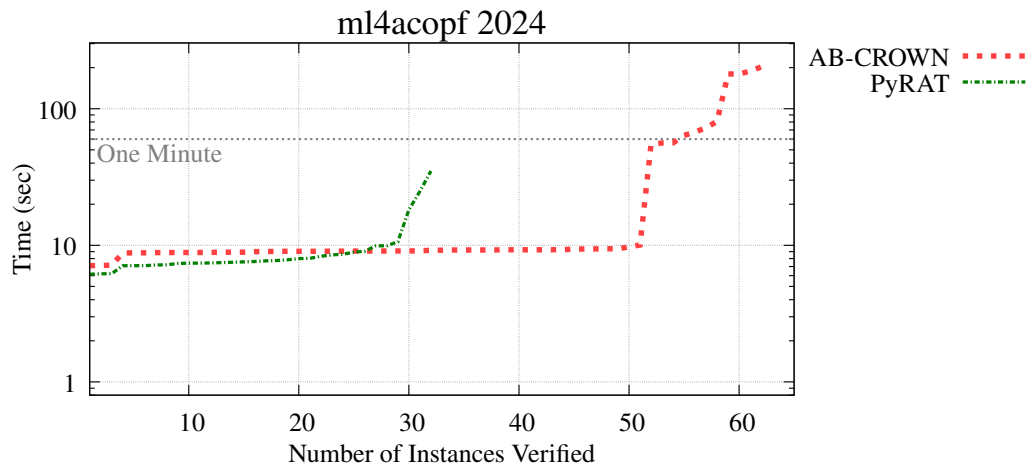


Figure 19: Cactus Plot for ml4acopf 2024.

Table 19: Benchmark 2024-traffic-signs-recognition-2023

#	Tool	Verified	Falsified	Fastest	Penalty Points	Score	Solved
1	$\alpha$ - $\beta$ -CROWN	0	45	0	0	450	100.0 100.0%
2	PyRAT	0	4	0	0	40	8.9 8.9%
3	NeuralSAT	0	0	0	11	-1650	0 0.0%

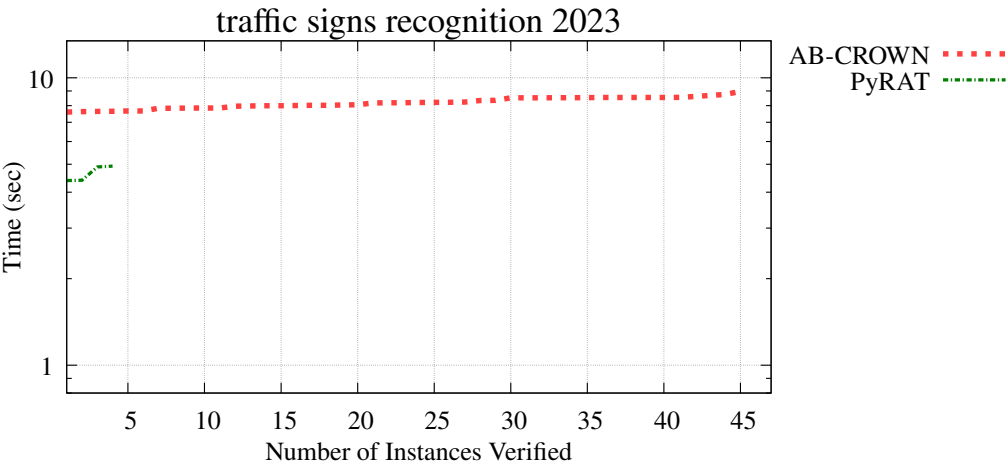


Figure 20: Cactus Plot for traffic signs recognition 2023.

Table 20: Benchmark 2024-vggnet16-2023

#	Tool	Verified	Falsified	Fastest	Penalty Points	Score	Solved
1	$\alpha$ - $\beta$ -CROWN	18	0	0	0	180	100.0%
2	nnenum	13	0	0	0	130	72.2%
3	PyRAT	10	0	0	0	100	55.6%
4	NeuralSAT	6	0	0	0	60	33.3%

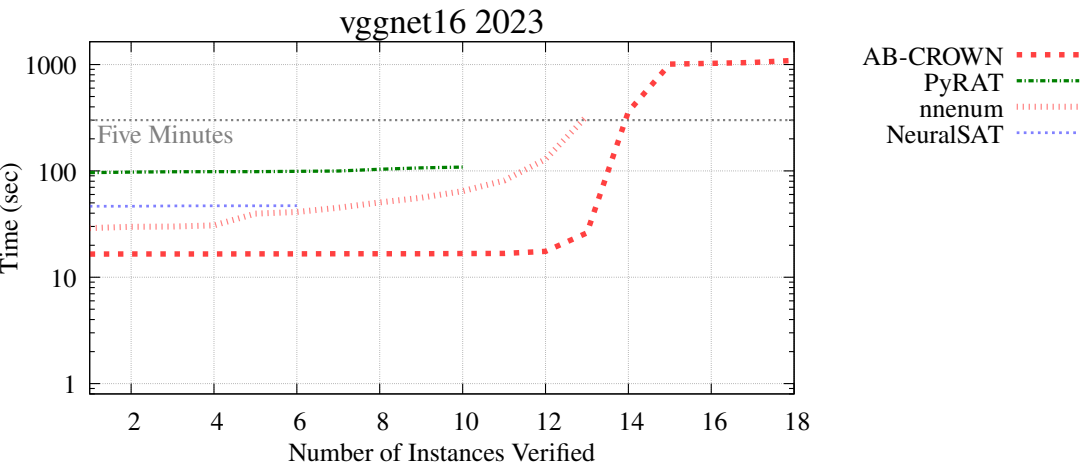


Figure 21: Cactus Plot for vggnet16 2023.

Table 21: Benchmark 2024-vit-2023

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	$\alpha$ - $\beta$ -CROWN	84	0	0	0	840	100.0	42.0%
2	NeuralSAT	11	0	0	0	110	13.1	5.5%

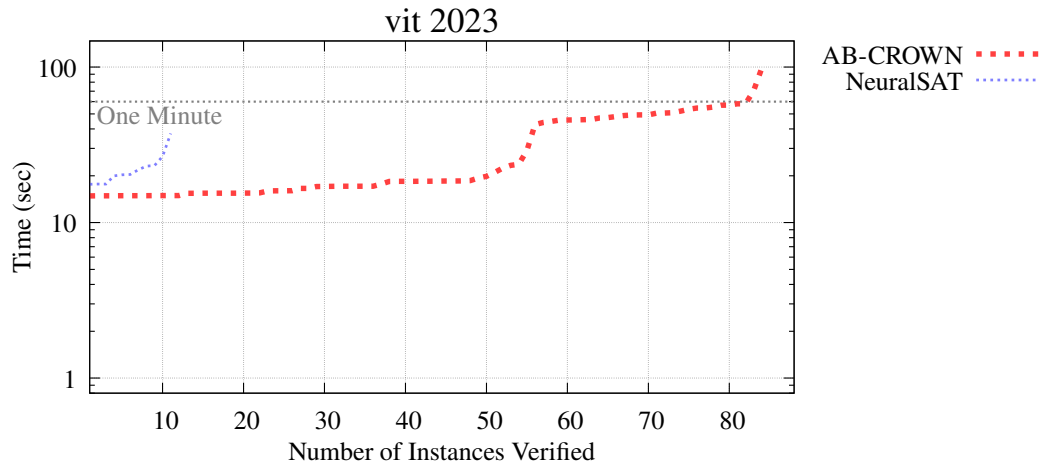


Figure 22: Cactus Plot for vit 2023.



Table 22: Benchmark 2024-yolo-2023

#	Tool	Verified	Falsified	Fastest	Penalty	Points	Score	Solved
1	$\alpha$ - $\beta$ -CROWN	60	0	0	0	600	100.0	83.3%
2	PyRAT	43	0	0	0	430	71.7	59.7%

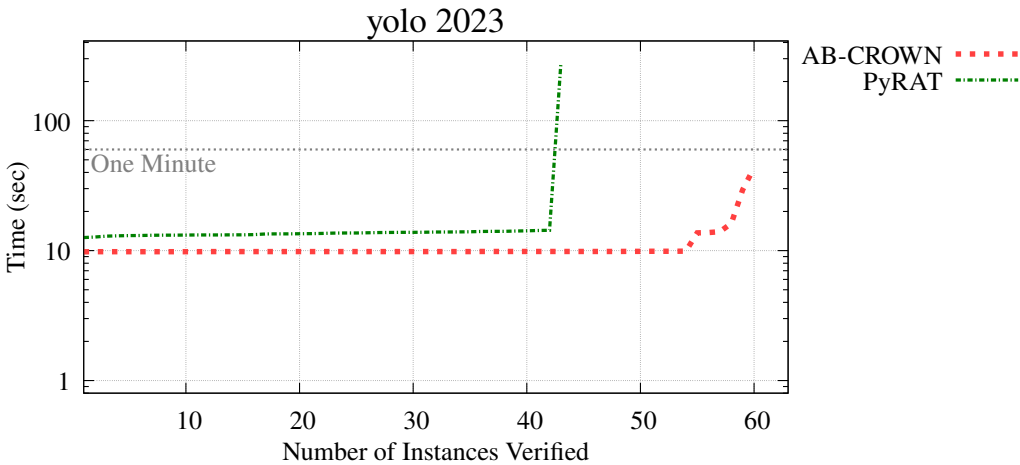


Figure 23: Cactus Plot for yolo 2023.

## 4 Stats

Table 23: Overhead

#	Tool	Seconds
1	NeuralSAT	0.3
2	nnenum	0.9
3	Marabou	1.1
4	NeVer2	1.5
5	PyRAT	3.5
6	$\alpha$ - $\beta$ -CROWN	7.0
7	CORA	9.9
8	NNV	23.5

Table 24: Num Benchmarks Participated

#	Tool	Count
1	PyRAT	12
2	Marabou	12
3	$\alpha$ - $\beta$ -CROWN	12
4	nnenum	9
5	NNV	9
6	NeuralSAT	8
7	CORA	8
8	NeVer2	4

Table 25: Num Instances Verified

#	Tool	Count
1	$\alpha$ - $\beta$ -CROWN	2285
2	PyRAT	1760
3	nnenum	1398
4	Marabou	1394
5	NeVer2	848
6	CORA	828
7	NNV	736
8	NeuralSAT	489

Table 26: Num SAT

#	Tool	Count
1	$\alpha$ - $\beta$ -CROWN	993
2	PyRAT	890
3	nenum	755
4	Marabou	704
5	NeVer2	526
6	CORA	327
7	NNV	308

Table 27: Num UNSAT

#	Tool	Count
1	$\alpha$ - $\beta$ -CROWN	1292
2	PyRAT	870
3	Marabou	690
4	nenum	643
5	CORA	501
6	NeuralSAT	489
7	NNV	428
8	NeVer2	322

Table 28: Incorrect Results (or Missing CE)

#	Tool	Count
1	Marabou	403
2	NeuralSAT	281
3	CORA	101
4	nenum	2

## 5 Detailed Results

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (✗).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Acasxu 2023	0	UNSAT	9.87	7.87	8.11	1.51	-	3.42	12.1	4.61
2024 Acasxu 2023	1	UNSAT	9.03	9.92	8.10	1.42	-	4.00	11.1	4.46
2024 Acasxu 2023	2	UNSAT	9.24	11.4	8.10	1.71	-	10.7	11.1	9.90
2024 Acasxu 2023	3	UNSAT	9.25	9.29	8.10	1.71	-	8.11	12.5	9.83
2024 Acasxu 2023	4	UNSAT	9.05	7.25	8.10	1.42	-	2.90	11.6	4.33
2024 Acasxu 2023	5	UNSAT	9.14	8.80	8.10	1.70	-	3.86	12.5	4.44
2024 Acasxu 2023	6	UNSAT	8.95	6.90	8.10	1.37	-	2.40	11.3	4.26
2024 Acasxu 2023	7	UNSAT	8.95	6.17	8.10	1.50	-	1.93	12.4	4.33
2024 Acasxu 2023	8	UNSAT	8.87	5.25	8.10	1.34	-	1.92	12.5	4.25
2024 Acasxu 2023	9	UNSAT	9.03	11.2	8.10	1.69	-	5.73	13.5	4.43
2024 Acasxu 2023	10	UNSAT	9.27	14.2	8.11	1.89	-	16.3	11.5	9.73
2024 Acasxu 2023	11	UNSAT	9.28	11.0	8.10	1.78	-	8.40	12.6	9.87
2024 Acasxu 2023	12	UNSAT	9.17	9.44	8.10	1.45	-	5.28	12.5	7.47
2024 Acasxu 2023	13	UNSAT	9.51	17.6	10.1	1.89	-	55.6	13.5	7.32
2024 Acasxu 2023	14	UNSAT	9.51	17.2	9.11	1.82	-	37.2	12.7	10.0
2024 Acasxu 2023	15	UNSAT	9.82	35.5	25.2	2.21	-	-	11.8	11.5
2024 Acasxu 2023	16	UNSAT	9.71	35.0	18.1	2.17	-	-	11.8	12.9
2024 Acasxu 2023	17	UNSAT	9.80	37.3	25.2	2.38	-	-	12.5	13.2
2024 Acasxu 2023	18	UNSAT	9.26	12.8	8.10	1.61	-	9.15	11.6	4.48
2024 Acasxu 2023	19	UNSAT	9.41	11.1	8.10	1.53	-	11.0	12.5	9.88
2024 Acasxu 2023	20	UNSAT	9.25	11.4	8.10	1.53	-	6.18	12.5	4.80
2024 Acasxu 2023	21	UNSAT	9.23	8.81	8.10	1.46	-	6.60	12.3	6.44
2024 Acasxu 2023	22	UNSAT	9.46	14.3	8.10	1.72	-	14.4	12.5	6.01
2024 Acasxu 2023	23	UNSAT	9.60	25.7	13.1	2.43	-	100	12.4	11.7
2024 Acasxu 2023	24	UNSAT	9.61	29.2	19.1	2.39	-	-	12.5	11.1
2024 Acasxu 2023	25	UNSAT	9.76	26.6	16.1	2.17	-	110	12.6	11.2
2024 Acasxu 2023	26	UNSAT	10.2	26.6	46.2	1.99	-	-	11.5	14.4
2024 Acasxu 2023	27	UNSAT	9.42	14.1	9.10	1.93	-	15.7	14.0	12.0
2024 Acasxu 2023	28	UNSAT	9.18	13.0	8.10	1.79	-	5.83	12.7	4.82
2024 Acasxu 2023	29	UNSAT	9.25	11.1	8.10	1.71	-	8.73	12.4	5.02
2024 Acasxu 2023	30	UNSAT	9.23	9.59	8.10	1.52	-	10.8	13.7	7.38
2024 Acasxu 2023	31	UNSAT	9.36	17.6	8.10	1.82	-	29.1	12.2	10.4
2024 Acasxu 2023	32	UNSAT	9.74	33.3	24.2	2.80	-	-	12.4	12.7
2024 Acasxu 2023	33	UNSAT	9.88	55.6	39.2	2.29	-	-	12.5	16.6
2024 Acasxu 2023	34	UNSAT	9.70	25.9	24.2	2.09	-	-	12.7	13.4
2024 Acasxu 2023	35	UNSAT	10.2	51.7	53.3	3.34	-	-	12.8	17.4
2024 Acasxu 2023	36	UNSAT	9.14	11.1	8.10	1.50	-	8.28	13.6	5.86
2024 Acasxu 2023	37	UNSAT	9.29	10.8	8.10	1.67	-	6.17	12.5	5.12
2024 Acasxu 2023	38	UNSAT	9.18	9.88	8.10	1.65	-	4.55	13.6	4.46
2024 Acasxu 2023	39	UNSAT	9.07	8.72	8.10	1.63	-	6.60	12.8	5.48
2024 Acasxu 2023	40	UNSAT	9.28	13.5	8.10	1.56	-	15.6	12.4	10.0
2024 Acasxu 2023	41	UNSAT	9.50	22.9	14.1	1.94	-	48.3	14.0	16.5
2024 Acasxu 2023	42	UNSAT	9.56	21.1	11.1	1.97	-	83.8	12.4	10.5
2024 Acasxu 2023	43	UNSAT	9.75	39.1	23.2	2.09	-	-	12.6	12.9
2024 Acasxu 2023	44	UNSAT	9.65	29.7	16.1	2.31	-	112	12.8	11.7
2024 Acasxu 2023	45	UNSAT	9.91	10.7	15.1	1.49	-	59.7	14.6	4.88
2024 Acasxu 2023	46	UNSAT	7.00	11.3	1.09	1.19	-	113	✗	✗
2024 Acasxu 2023	47	UNSAT	7.40	30.8	92.4	1.73	-	20.4	✗	✗
2024 Acasxu 2023	48	UNSAT	7.02	7.52	1.09	1.20	-	8.97	✗	✗
2024 Acasxu 2023	49	UNSAT	7.45	44.5	-	1.17	-	-	12.9	✗
2024 Acasxu 2023	50	UNSAT	7.36	17.6	1.09	1.78	-	-	✗	✗
2024 Acasxu 2023	51	UNSAT	9.56	12.6	18.1	1.77	-	74.3	31.4	8.45
2024 Acasxu 2023	52	UNSAT	9.59	12.9	24.2	2.09	-	-	15.9	16.8
2024 Acasxu 2023	53	UNSAT	9.57	13.1	22.2	1.86	-	94.3	24.5	17.2
2024 Acasxu 2023	54	UNSAT	7.07	4.44	1.09	1.14	-	4.96	✗	✗
2024 Acasxu 2023	55	UNSAT	7.04	3.57	1.09	1.20	25.7	1.71	✗	✗
2024 Acasxu 2023	56	UNSAT	7.00	3.65	1.09	1.16	25.6	1.75	✗	✗
2024 Acasxu 2023	57	UNSAT	7.02	4.41	1.09	1.18	-	1.63	✗	✗
2024 Acasxu 2023	58	UNSAT	6.98	5.37	1.09	1.21	25.9	3.24	✗	✗
2024 Acasxu 2023	59	UNSAT	7.00	4.39	1.09	1.19	25.6	2.62	-	✗
2024 Acasxu 2023	60	UNSAT	7.00	4.04	1.10	1.18	25.6	4.46	✗	✗
2024 Acasxu 2023	61	UNSAT	6.99	4.38	1.09	1.17	25.5	17.7	✗	✗
2024 Acasxu 2023	62	UNSAT	7.02	11.7	1.09	1.28	-	5.11	✗	✗

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Acasxu 2023	63	UNSAT	7.01	3.98	1.09	1.11	26.0	1.65	X	X
2024 Acasxu 2023	64	UNSAT	7.37	10.4	1.09	1.18	-	13.2	X	X
2024 Acasxu 2023	65	UNSAT	21.6	-	-	5.43	-	-	-	-
2024 Acasxu 2023	66	UNSAT	7.00	5.20	1.09	1.10	26.0	1.67	X	X
2024 Acasxu 2023	67	UNSAT	7.00	5.23	1.09	1.12	26.6	6.12	X	X
2024 Acasxu 2023	68	UNSAT	7.00	3.65	1.09	1.18	25.5	2.71	X	X
2024 Acasxu 2023	69	UNSAT	7.02	11.8	1.10	1.40	-	-	X	X
2024 Acasxu 2023	70	UNSAT	7.02	3.99	1.09	1.14	-	44.9	X	X
2024 Acasxu 2023	71	UNSAT	6.99	4.02	1.09	1.14	25.5	1.65	X	X
2024 Acasxu 2023	72	UNSAT	7.05	3.92	1.09	1.19	-	1.64	X	X
2024 Acasxu 2023	73	UNSAT	11.7	78.3	-	5.84	-	-	-	20.1
2024 Acasxu 2023	74	UNSAT	7.00	4.34	1.09	1.10	25.7	1.64	X	X
2024 Acasxu 2023	75	UNSAT	7.04	7.59	1.09	1.15	25.6	1.65	X	X
2024 Acasxu 2023	76	UNSAT	7.02	3.92	1.09	1.22	-	1.66	X	X
2024 Acasxu 2023	77	UNSAT	6.98	5.58	1.09	1.19	25.6	1.66	X	X
2024 Acasxu 2023	78	UNSAT	6.99	4.40	1.09	1.19	26.3	4.06	X	X
2024 Acasxu 2023	79	UNSAT	7.01	3.99	1.09	1.21	25.7	4.88	X	X
2024 Acasxu 2023	80	UNSAT	7.01	7.35	1.09	1.18	-	-	X	X
2024 Acasxu 2023	81	UNSAT	7.00	5.39	1.09	1.17	-	1.63	X	X
2024 Acasxu 2023	82	UNSAT	7.01	5.33	1.09	1.20	-	1.65	X	X
2024 Acasxu 2023	83	UNSAT	7.58	103	83.4	1.51	-	-	-	-
2024 Acasxu 2023	84	UNSAT	7.03	5.17	1.09	1.19	-	2.06	X	X
2024 Acasxu 2023	85	UNSAT	7.01	4.03	1.09	1.21	25.5	1.63	X	X
2024 Acasxu 2023	86	UNSAT	7.05	11.2	1.09	1.22	26.9	7.01	X	X
2024 Acasxu 2023	87	UNSAT	7.01	5.00	1.09	1.16	25.8	1.64	X	X
2024 Acasxu 2023	88	UNSAT	7.02	3.57	1.09	1.14	26.2	22.2	X	X
2024 Acasxu 2023	89	UNSAT	7.02	3.59	1.10	1.18	25.8	3.40	X	X
2024 Acasxu 2023	90	UNSAT	9.31	79.7	17.4	1.53	-	-	13.0	17.0
2024 Acasxu 2023	91	UNSAT	8.55	6.49	9.10	1.48	-	10.7	12.2	4.76
2024 Acasxu 2023	92	UNSAT	8.83	6.74	13.2	1.37	-	-	-	14.3
2024 Acasxu 2023	93	UNSAT	8.36	3.73	7.10	1.21	27.8	1.69	12.5	4.24
2024 Acasxu 2023	94	UNSAT	8.31	3.77	8.10	1.23	27.5	2.22	11.2	4.21
2024 Acasxu 2023	95	UNSAT	7.82	3.73	6.10	1.15	27.1	1.52	12.2	4.21
2024 Acasxu 2023	96	UNSAT	7.03	3.60	1.09	1.14	25.5	1.55	12.0	X
2024 Acasxu 2023	97	UNSAT	6.99	3.57	1.09	1.19	25.7	1.54	11.8	X
2024 Acasxu 2023	98	UNSAT	7.04	3.61	1.09	1.18	25.4	1.54	11.9	X
2024 Acasxu 2023	99	UNSAT	8.92	4.73	8.10	1.40	-	4.52	11.2	7.93
2024 Acasxu 2023	100	UNSAT	8.85	5.05	9.11	1.39	-	18.2	11.5	4.45
2024 Acasxu 2023	101	UNSAT	8.84	5.24	8.10	1.37	-	5.57	14.3	5.12
2024 Acasxu 2023	102	UNSAT	7.83	3.74	6.09	0.96	28.4	1.50	13.5	4.27
2024 Acasxu 2023	103	UNSAT	8.36	3.71	8.10	1.21	27.9	1.67	13.6	4.16
2024 Acasxu 2023	104	UNSAT	7.80	3.71	6.09	1.20	27.4	1.51	13.8	4.21
2024 Acasxu 2023	105	UNSAT	7.80	3.70	6.09	1.17	28.0	1.48	13.5	4.57
2024 Acasxu 2023	106	UNSAT	7.82	3.64	6.09	1.17	27.6	1.51	11.1	4.22
2024 Acasxu 2023	107	UNSAT	7.83	3.71	6.09	0.94	27.9	1.49	12.2	4.17
2024 Acasxu 2023	108	UNSAT	8.38	4.49	8.10	1.13	28.0	1.85	12.8	5.86
2024 Acasxu 2023	109	UNSAT	8.47	5.22	8.10	1.50	-	8.86	13.8	4.30
2024 Acasxu 2023	110	UNSAT	8.46	3.69	7.10	1.36	28.3	5.68	14.1	4.34
2024 Acasxu 2023	111	UNSAT	8.71	4.10	8.10	1.26	106	1.89	12.5	4.18
2024 Acasxu 2023	112	UNSAT	8.23	3.68	6.09	1.14	27.2	1.63	11.4	4.24
2024 Acasxu 2023	113	UNSAT	8.47	4.10	8.10	1.15	104	1.74	13.6	5.42
2024 Acasxu 2023	114	UNSAT	7.77	3.70	6.09	1.10	28.0	1.49	12.5	4.08
2024 Acasxu 2023	115	UNSAT	8.22	4.06	7.10	1.09	28.1	1.78	12.6	4.37
2024 Acasxu 2023	116	UNSAT	8.33	3.69	6.09	1.09	28.7	1.67	12.4	4.31
2024 Acasxu 2023	117	UNSAT	8.55	5.13	8.10	1.12	108	11.2	12.4	5.98
2024 Acasxu 2023	118	UNSAT	8.58	5.63	10.1	1.38	-	24.4	12.8	4.84
2024 Acasxu 2023	119	UNSAT	9.08	5.24	8.10	1.52	-	32.2	13.0	4.51
2024 Acasxu 2023	120	UNSAT	8.36	3.65	6.09	1.16	28.7	1.61	12.4	4.18
2024 Acasxu 2023	121	UNSAT	7.93	3.72	6.09	1.25	27.8	1.51	12.6	4.08
2024 Acasxu 2023	122	UNSAT	8.36	4.07	8.11	1.16	28.8	1.77	12.6	5.42
2024 Acasxu 2023	123	UNSAT	8.35	3.68	6.09	1.16	27.4	1.66	12.2	4.25
2024 Acasxu 2023	124	UNSAT	7.77	3.69	6.09	1.15	27.9	1.47	12.1	4.39
2024 Acasxu 2023	125	UNSAT	8.75	3.71	8.10	1.14	27.4	1.68	13.1	4.36
2024 Acasxu 2023	126	UNSAT	8.54	7.62	9.11	1.42	-	19.7	12.6	5.51
2024 Acasxu 2023	127	UNSAT	8.69	4.03	7.10	1.17	28.2	1.86	11.4	4.27
2024 Acasxu 2023	128	UNSAT	8.40	4.13	7.10	1.24	27.8	1.91	13.9	4.26
2024 Acasxu 2023	129	UNSAT	8.37	3.72	6.10	1.09	27.8	1.63	12.4	4.20
2024 Acasxu 2023	130	UNSAT	8.43	3.73	8.10	1.20	27.6	1.72	11.2	4.33

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Acasxu 2023	131	UNSAT	8.22	3.71	8.10	1.18	27.8	1.68	11.4	4.23
2024 Acasxu 2023	132	UNSAT	7.92	3.69	6.10	0.88	27.1	1.48	12.5	4.06
2024 Acasxu 2023	133	UNSAT	8.23	3.74	7.10	1.09	27.5	1.83	12.5	4.35
2024 Acasxu 2023	134	UNSAT	8.38	3.68	6.10	0.89	27.8	1.50	13.6	4.26
2024 Acasxu 2023	135	UNSAT	8.65	12.7	8.12	1.36	-	21.0	19.5	4.37
2024 Acasxu 2023	136	UNSAT	8.45	6.49	8.10	1.32	-	11.2	13.1	9.63
2024 Acasxu 2023	137	UNSAT	8.55	7.16	8.10	1.26	-	13.9	13.2	4.37
2024 Acasxu 2023	138	UNSAT	8.47	4.69	7.10	1.16	92.6	1.77	11.5	4.29
2024 Acasxu 2023	139	UNSAT	8.31	4.10	7.10	1.23	-	2.21	12.5	4.29
2024 Acasxu 2023	140	UNSAT	8.24	4.35	7.10	1.20	27.8	1.79	12.5	4.20
2024 Acasxu 2023	141	UNSAT	7.05	3.59	1.09	1.09	25.5	1.55	13.1	X
2024 Acasxu 2023	142	UNSAT	7.00	3.63	1.09	1.12	25.6	1.56	11.8	X
2024 Acasxu 2023	143	UNSAT	7.00	3.60	1.09	1.18	25.8	1.54	13.1	X
2024 Acasxu 2023	144	UNSAT	8.38	4.67	8.10	1.25	118	1.99	11.5	4.40
2024 Acasxu 2023	145	UNSAT	8.37	4.59	8.10	1.24	116	2.06	11.4	4.47
2024 Acasxu 2023	146	UNSAT	8.26	4.04	6.09	1.19	27.7	1.63	12.4	4.21
2024 Acasxu 2023	147	UNSAT	8.39	3.71	6.09	1.19	28.0	1.62	12.4	4.17
2024 Acasxu 2023	148	UNSAT	8.36	4.05	8.10	1.21	27.7	1.72	13.2	4.22
2024 Acasxu 2023	149	UNSAT	8.37	3.74	8.10	1.23	27.9	1.73	12.7	4.35
2024 Acasxu 2023	150	UNSAT	8.41	3.73	6.09	1.19	27.4	1.61	12.3	4.26
2024 Acasxu 2023	151	UNSAT	8.80	4.14	8.10	1.21	102	1.89	12.4	4.25
2024 Acasxu 2023	152	UNSAT	7.82	3.67	6.10	0.94	27.4	1.49	12.3	4.06
2024 Acasxu 2023	153	UNSAT	8.44	4.13	8.10	1.16	27.5	2.08	13.1	4.38
2024 Acasxu 2023	154	UNSAT	8.49	4.08	7.10	1.23	27.8	1.75	12.2	4.24
2024 Acasxu 2023	155	UNSAT	7.99	3.67	6.09	1.08	27.5	1.61	12.4	4.23
2024 Acasxu 2023	156	UNSAT	8.21	3.69	6.09	1.08	27.2	1.63	12.2	4.11
2024 Acasxu 2023	157	UNSAT	8.35	4.05	8.10	1.14	28.0	1.75	13.9	4.27
2024 Acasxu 2023	158	UNSAT	8.66	3.71	8.10	1.18	29.2	1.64	12.4	4.35
2024 Acasxu 2023	159	UNSAT	8.38	3.67	6.09	1.12	28.4	1.61	11.2	4.24
2024 Acasxu 2023	160	UNSAT	8.48	4.30	8.10	1.12	90.9	1.76	11.4	4.19
2024 Acasxu 2023	161	UNSAT	8.38	4.06	8.10	1.21	27.4	1.70	12.3	4.26
2024 Acasxu 2023	162	UNSAT	7.81	3.71	6.09	1.12	27.7	1.51	11.2	4.30
2024 Acasxu 2023	163	UNSAT	8.66	4.10	8.10	1.10	27.9	1.76	12.4	4.38
2024 Acasxu 2023	164	UNSAT	8.38	4.42	8.10	1.09	27.6	1.81	11.5	4.24
2024 Acasxu 2023	165	UNSAT	8.36	4.07	8.10	1.17	94.4	1.78	11.2	4.22
2024 Acasxu 2023	166	UNSAT	8.35	3.76	7.10	1.10	27.9	1.65	12.5	4.27
2024 Acasxu 2023	167	UNSAT	8.33	3.68	6.09	1.13	28.3	1.60	12.3	4.23
2024 Acasxu 2023	168	UNSAT	8.22	3.72	6.10	1.08	28.1	1.60	13.5	4.31
2024 Acasxu 2023	169	UNSAT	8.42	3.76	6.09	1.15	28.0	1.60	13.8	4.34
2024 Acasxu 2023	170	UNSAT	8.39	3.71	6.09	1.20	28.0	1.58	12.7	4.23
2024 Acasxu 2023	171	UNSAT	8.35	3.71	7.10	1.13	28.5	1.74	12.3	4.39
2024 Acasxu 2023	172	UNSAT	8.31	3.69	6.10	1.08	27.9	1.64	12.2	4.27
2024 Acasxu 2023	173	UNSAT	8.39	3.71	7.10	1.09	28.7	1.84	12.5	4.23
2024 Acasxu 2023	174	UNSAT	8.22	3.73	6.10	1.11	27.7	1.59	12.4	4.19
2024 Acasxu 2023	175	UNSAT	8.47	3.68	7.10	1.21	27.6	1.64	12.5	4.29
2024 Acasxu 2023	176	UNSAT	7.77	3.70	6.10	1.16	28.6	1.60	13.7	4.45
2024 Acasxu 2023	177	UNSAT	7.92	3.72	6.09	1.15	27.6	1.50	13.6	4.22
2024 Acasxu 2023	178	UNSAT	8.40	3.72	8.10	1.14	28.0	1.69	13.8	4.40
2024 Acasxu 2023	179	UNSAT	8.26	3.71	6.10	1.19	27.6	1.62	11.4	4.29
2024 Acasxu 2023	180	UNSAT	13.7	-	-	1.88	-	-	-	17.4
2024 Acasxu 2023	181	UNSAT	15.5	61.4	-	5.17	-	-	13.0	14.6
2024 Acasxu 2023	182	UNSAT	7.40	13.7	X	-	-	-	-	X
2024 Acasxu 2023	183	UNSAT	7.04	9.39	1.09	1.22	-	-	-	X
2024 Acasxu 2023	184	UNSAT	13.0	25.9	-	3.15	-	-	-	12.3
2024 Acasxu 2023	185	UNSAT	12.1	8.81	27.2	1.61	-	56.1	12.3	12.8
2024 Cgan 2023	0	UNSAT	7.33	6.90	1.09	13.4	28.4	-	-	X
2024 Cgan 2023	1	UNSAT	7.33	6.25	1.09	32.1	29.2	-	-	X
2024 Cgan 2023	2	UNSAT	7.38	6.40	1.09	14.7	27.8	-	-	X
2024 Cgan 2023	3	UNSAT	11.6	14.7	-	26.1	194	-	-	9.22
2024 Cgan 2023	4	UNSAT	7.35	6.11	1.09	10.5	28.0	-	-	X
2024 Cgan 2023	5	UNSAT	14.4	22.4	-	56.6	-	-	-	23.8
2024 Cgan 2023	6	UNSAT	7.18	6.09	1.09	1.85	28.1	-	-	X
2024 Cgan 2023	7	UNSAT	7.31	6.12	1.09	16.0	27.7	-	-	X
2024 Cgan 2023	8	UNSAT	23.3	20.9	-	168	-	-	-	213
2024 Cgan 2023	9	UNSAT	16.2	12.4	-	41.5	328	-	-	205
2024 Cgan 2023	10	UNSAT	7.24	6.12	1.09	1.85	28.8	-	-	X
2024 Cgan 2023	11	UNSAT	7.21	6.17	1.09	1.86	28.8	-	-	X
2024 Cgan 2023	12	UNSAT	17.4	12.7	-	33.5	44.2	-	-	32.5

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Cgan 2023	13	UNSAT	17.1	16.6	-	58.1	460	-	-	111
2024 Cgan 2023	14	UNSAT	7.27	6.16	1.09	1.76	28.2	-	-	X
2024 Cgan 2023	15	UNSAT	7.38	6.13	1.09	61.7	28.6	-	-	X
2024 Cgan 2023	16	UNSAT	11.4	11.3	-	-	35.1	-	-	10.8
2024 Cgan 2023	17	UNSAT	7.30	6.11	1.09	9.03	28.8	-	-	X
2024 Cgan 2023	18	UNSAT	10.1	11.0	-	-	114	-	-	14.6
2024 Cgan 2023	19	UNSAT	9.36	16.7	2.10	-	-	-	-	-
2024 Cgan 2023	20	UNSAT	9.34	23.0	2.09	-	-	-	-	-
2024 Cifar100	0	UNSAT	42.3	-	-	-	-	-	-	74.9
2024 Cifar100	1	UNSAT	17.9	16.3	-	-	-	-	-	22.7
2024 Cifar100	2	UNSAT	9.81	6.42	3.10	-	-	-	-	X
2024 Cifar100	3	UNSAT	26.0	-	-	-	-	-	-	38.7
2024 Cifar100	4	UNSAT	32.9	-	-	-	-	-	-	56.7
2024 Cifar100	5	?	-	-	-	-	-	-	-	-
2024 Cifar100	6	UNSAT	18.0	14.9	-	-	-	-	-	21.6
2024 Cifar100	7	?	-	-	-	-	-	-	-	-
2024 Cifar100	8	UNSAT	36.5	-	-	-	-	-	-	53.9
2024 Cifar100	9	?	-	-	-	-	-	-	-	-
2024 Cifar100	10	?	-	-	-	-	-	-	-	-
2024 Cifar100	11	UNSAT	15.0	10.6	-	-	-	-	-	16.3
2024 Cifar100	12	UNSAT	9.72	6.34	39.3	-	-	-	-	X
2024 Cifar100	13	UNSAT	9.65	6.43	3.10	-	-	-	-	X
2024 Cifar100	14	?	-	-	-	-	-	-	-	-
2024 Cifar100	15	UNSAT	9.70	6.44	5.11	-	-	-	-	X
2024 Cifar100	16	?	-	-	-	-	-	-	-	-
2024 Cifar100	17	UNSAT	30.0	-	-	-	-	-	-	48.8
2024 Cifar100	18	UNSAT	18.9	-	-	-	-	-	-	26.8
2024 Cifar100	19	UNSAT	18.0	110	-	-	-	-	-	23.9
2024 Cifar100	20	UNSAT	9.82	6.36	3.10	-	-	-	-	X
2024 Cifar100	21	UNSAT	9.72	6.41	4.10	-	-	-	-	X
2024 Cifar100	22	UNSAT	18.0	73.0	-	-	-	-	-	24.5
2024 Cifar100	23	UNSAT	28.2	-	-	-	-	-	-	42.7
2024 Cifar100	24	?	-	-	-	-	-	-	-	-
2024 Cifar100	25	UNSAT	9.71	6.48	4.11	-	-	-	-	X
2024 Cifar100	26	UNSAT	17.9	20.2	-	-	-	-	-	23.1
2024 Cifar100	27	UNSAT	86.3	-	-	-	-	-	-	-
2024 Cifar100	28	UNSAT	9.82	6.44	14.2	-	-	-	-	X
2024 Cifar100	29	UNSAT	17.8	19.5	-	-	-	-	-	22.1
2024 Cifar100	30	?	-	-	-	-	-	-	-	-
2024 Cifar100	31	UNSAT	9.66	6.44	4.10	-	-	-	-	X
2024 Cifar100	32	UNSAT	35.7	-	-	-	-	-	-	53.4
2024 Cifar100	33	UNSAT	19.0	109	-	-	-	-	-	28.5
2024 Cifar100	34	UNSAT	18.0	12.7	-	-	-	-	-	21.6
2024 Cifar100	35	UNSAT	18.8	-	-	-	-	-	-	26.3
2024 Cifar100	36	UNSAT	18.8	109	-	-	-	-	-	30.1
2024 Cifar100	37	?	-	-	-	-	-	-	-	-
2024 Cifar100	38	?	-	-	-	-	-	-	-	-
2024 Cifar100	39	UNSAT	17.9	12.7	-	-	-	-	-	21.8
2024 Cifar100	40	UNSAT	18.0	23.8	-	-	-	-	-	23.5
2024 Cifar100	41	UNSAT	9.69	6.40	6.12	-	-	-	-	X
2024 Cifar100	42	UNSAT	18.0	16.5	-	-	-	-	-	23.1
2024 Cifar100	43	?	-	-	-	-	-	-	-	-
2024 Cifar100	44	?	-	-	-	-	-	-	-	-
2024 Cifar100	45	UNSAT	29.0	-	-	-	-	-	-	44.5
2024 Cifar100	46	UNSAT	14.9	10.7	-	-	-	-	-	15.6
2024 Cifar100	47	UNSAT	9.67	6.45	8.13	-	-	-	-	X
2024 Cifar100	48	?	-	-	-	-	-	-	-	-
2024 Cifar100	49	UNSAT	93.9	-	-	-	-	-	-	-
2024 Cifar100	50	UNSAT	9.70	-	7.12	-	-	-	-	20.9
2024 Cifar100	51	UNSAT	9.69	6.42	7.12	-	-	-	-	X
2024 Cifar100	52	UNSAT	9.72	-	33.3	-	-	-	-	X
2024 Cifar100	53	UNSAT	18.4	71.4	-	-	-	-	-	25.3
2024 Cifar100	54	UNSAT	9.71	6.40	3.10	-	-	-	-	X
2024 Cifar100	55	UNSAT	9.71	6.48	4.11	-	-	-	-	X
2024 Cifar100	56	UNSAT	21.4	109	-	-	-	-	-	35.0
2024 Cifar100	57	UNSAT	14.8	10.8	-	-	-	-	-	15.9
2024 Cifar100	58	?	-	-	-	-	-	-	-	-
2024 Cifar100	59	UNSAT	14.9	10.7	-	-	-	-	-	16.1

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Cifar100	60	UNSAT	9.69	6.44	5.11	-	-	-	-	X
2024 Cifar100	61	UNSAT	19.2	75.1	-	-	-	-	-	29.7
2024 Cifar100	62	UNSAT	36.4	-	-	-	-	-	-	56.9
2024 Cifar100	63	UNSAT	84.6	-	-	-	-	-	-	-
2024 Cifar100	64	UNSAT	17.9	39.6	-	-	-	-	-	24.4
2024 Cifar100	65	UNSAT	22.9	-	-	-	-	-	-	54.2
2024 Cifar100	66	UNSAT	21.7	110	-	-	-	-	-	38.7
2024 Cifar100	67	UNSAT	18.4	82.1	-	-	-	-	-	26.6
2024 Cifar100	68	UNSAT	17.9	20.4	-	-	-	-	-	22.0
2024 Cifar100	69	UNSAT	18.3	23.0	-	-	-	-	-	22.6
2024 Cifar100	70	?	-	-	-	-	-	-	-	-
2024 Cifar100	71	?	-	-	-	-	-	-	-	-
2024 Cifar100	72	UNSAT	14.1	10.9	-	-	-	-	-	17.2
2024 Cifar100	73	UNSAT	19.2	-	-	-	-	-	-	35.1
2024 Cifar100	74	UNSAT	18.0	20.5	-	-	-	-	-	22.5
2024 Cifar100	75	?	-	-	-	-	-	-	-	-
2024 Cifar100	76	?	-	-	-	-	-	-	-	-
2024 Cifar100	77	UNSAT	19.3	111	-	-	-	-	-	29.5
2024 Cifar100	78	UNSAT	19.0	-	-	-	-	-	-	27.2
2024 Cifar100	79	?	-	-	-	-	-	-	-	-
2024 Cifar100	80	UNSAT	9.71	6.38	4.10	-	-	-	-	X
2024 Cifar100	81	?	-	-	-	-	-	-	-	-
2024 Cifar100	82	UNSAT	17.9	16.4	-	-	-	-	-	22.1
2024 Cifar100	83	UNSAT	17.9	16.5	-	-	-	-	-	22.8
2024 Cifar100	84	UNSAT	19.7	-	-	-	-	-	-	33.8
2024 Cifar100	85	UNSAT	9.21	-	5.11	-	-	-	-	X
2024 Cifar100	86	UNSAT	25.6	-	-	-	-	-	-	37.9
2024 Cifar100	87	?	-	-	-	-	-	-	-	-
2024 Cifar100	88	UNSAT	20.2	-	-	-	-	-	-	31.7
2024 Cifar100	89	UNSAT	23.0	-	-	-	-	-	-	35.5
2024 Cifar100	90	UNSAT	19.7	-	-	-	-	-	-	32.4
2024 Cifar100	91	UNSAT	19.1	-	-	-	-	-	-	30.9
2024 Cifar100	92	?	-	-	-	-	-	-	-	-
2024 Cifar100	93	?	-	-	-	-	-	-	-	-
2024 Cifar100	94	UNSAT	26.2	-	-	-	-	-	-	39.4
2024 Cifar100	95	UNSAT	29.4	-	-	-	-	-	-	49.2
2024 Cifar100	96	?	-	-	-	-	-	-	-	-
2024 Cifar100	97	UNSAT	17.8	18.0	-	-	-	-	-	22.5
2024 Cifar100	98	UNSAT	14.7	10.6	-	-	-	-	-	15.6
2024 Cifar100	99	UNSAT	9.73	6.40	3.10	-	-	-	-	X
2024 Cifar100	100	UNSAT	25.6	-	-	-	-	-	-	-
2024 Cifar100	101	UNSAT	13.9	15.8	-	-	-	-	-	19.5
2024 Cifar100	102	UNSAT	23.4	-	-	-	-	-	-	61.5
2024 Cifar100	103	UNSAT	23.7	20.8	-	-	-	-	-	48.1
2024 Cifar100	104	UNSAT	10.1	-	-	-	-	-	-	-
2024 Cifar100	105	UNSAT	13.6	16.8	-	-	-	-	-	17.9
2024 Cifar100	106	?	-	-	-	-	-	-	-	-
2024 Cifar100	107	UNSAT	22.0	80.4	-	-	-	-	-	-
2024 Cifar100	108	?	-	-	-	-	-	-	-	-
2024 Cifar100	109	UNSAT	24.4	30.5	-	-	-	-	-	-
2024 Cifar100	110	UNSAT	10.1	-	4.10	-	-	-	-	X
2024 Cifar100	111	?	-	-	-	-	-	-	-	-
2024 Cifar100	112	?	-	-	-	-	-	-	-	-
2024 Cifar100	113	UNSAT	14.9	14.7	-	-	-	-	-	19.0
2024 Cifar100	114	?	-	-	-	-	-	-	-	-
2024 Cifar100	115	UNSAT	91.6	110	-	-	-	-	-	-
2024 Cifar100	116	?	-	-	-	-	-	-	-	-
2024 Cifar100	117	UNSAT	13.6	16.4	-	-	-	-	-	-
2024 Cifar100	118	UNSAT	28.0	-	-	-	-	-	-	-
2024 Cifar100	119	UNSAT	103	-	-	-	-	-	-	-
2024 Cifar100	120	UNSAT	22.4	94.5	-	-	-	-	-	50.1
2024 Cifar100	121	?	-	-	-	-	-	-	-	-
2024 Cifar100	122	UNSAT	27.6	-	-	-	-	-	-	-
2024 Cifar100	123	?	-	-	-	-	-	-	-	-
2024 Cifar100	124	UNSAT	40.3	-	-	-	-	-	-	88.2
2024 Cifar100	125	UNSAT	22.5	-	-	-	-	-	-	43.1
2024 Cifar100	126	UNSAT	25.4	-	-	-	-	-	-	64.5
2024 Cifar100	127	?	-	-	-	-	-	-	-	-



Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Cifar100	128	UNSAT	-	112	-	-	-	-	-	-
2024 Cifar100	129	UNSAT	10.2	6.53	4.10	-	-	-	-	-
2024 Cifar100	130	?	-	-	-	-	-	-	-	-
2024 Cifar100	131	UNSAT	25.6	-	-	-	-	-	-	-
2024 Cifar100	132	UNSAT	23.0	22.3	-	-	-	-	-	-
2024 Cifar100	133	UNSAT	32.6	-	-	-	-	-	-	64.3
2024 Cifar100	134	UNSAT	23.7	110	-	-	-	-	-	-
2024 Cifar100	135	UNSAT	13.7	13.6	-	-	-	-	-	18.5
2024 Cifar100	136	UNSAT	15.4	17.4	-	-	-	-	-	25.5
2024 Cifar100	137	UNSAT	24.9	-	-	-	-	-	-	58.1
2024 Cifar100	138	?	-	-	-	-	-	-	-	-
2024 Cifar100	139	?	-	-	-	-	-	-	-	-
2024 Cifar100	140	UNSAT	23.9	44.9	-	-	-	-	-	36.6
2024 Cifar100	141	UNSAT	24.5	-	-	-	-	-	-	-
2024 Cifar100	142	UNSAT	14.1	16.1	-	-	-	-	-	21.1
2024 Cifar100	143	?	-	-	-	-	-	-	-	-
2024 Cifar100	144	UNSAT	91.4	-	-	-	-	-	-	-
2024 Cifar100	145	UNSAT	48.9	-	-	-	-	-	-	-
2024 Cifar100	146	UNSAT	14.8	16.4	-	-	-	-	-	19.6
2024 Cifar100	147	?	-	-	-	-	-	-	-	-
2024 Cifar100	148	UNSAT	10.3	-	7.12	-	-	-	-	-
2024 Cifar100	149	UNSAT	11.0	6.68	14.2	-	-	-	-	-
2024 Cifar100	150	UNSAT	14.1	16.1	-	-	-	-	-	20.8
2024 Cifar100	151	?	-	-	-	-	-	-	-	-
2024 Cifar100	152	UNSAT	27.3	-	-	-	-	-	-	-
2024 Cifar100	153	UNSAT	15.5	17.2	-	-	-	-	-	-
2024 Cifar100	154	UNSAT	23.9	45.9	-	-	-	-	-	56.1
2024 Cifar100	155	UNSAT	15.3	16.3	-	-	-	-	-	23.3
2024 Cifar100	156	?	-	-	-	-	-	-	-	-
2024 Cifar100	157	?	-	-	-	-	-	-	-	-
2024 Cifar100	158	?	-	-	-	-	-	-	-	-
2024 Cifar100	159	UNSAT	25.8	-	-	-	-	-	-	-
2024 Cifar100	160	?	-	-	-	-	-	-	-	-
2024 Cifar100	161	UNSAT	22.2	21.4	-	-	-	-	-	52.0
2024 Cifar100	162	UNSAT	22.7	56.7	-	-	-	-	-	59.0
2024 Cifar100	163	UNSAT	24.1	-	-	-	-	-	-	-
2024 Cifar100	164	?	-	-	-	-	-	-	-	-
2024 Cifar100	165	UNSAT	14.4	16.5	-	-	-	-	-	24.5
2024 Cifar100	166	UNSAT	22.7	46.0	-	-	-	-	-	57.9
2024 Cifar100	167	?	-	-	-	-	-	-	-	-
2024 Cifar100	168	UNSAT	13.6	14.8	-	-	-	-	-	18.6
2024 Cifar100	169	UNSAT	10.2	6.53	22.2	-	-	-	-	-
2024 Cifar100	170	UNSAT	13.9	16.5	-	-	-	-	-	19.9
2024 Cifar100	171	UNSAT	24.0	46.2	-	-	-	-	-	53.5
2024 Cifar100	172	UNSAT	9.90	-	-	-	-	-	-	53.0
2024 Cifar100	173	UNSAT	10.1	6.50	4.11	-	-	-	-	X
2024 Cifar100	174	UNSAT	24.9	111	-	-	-	-	-	-
2024 Cifar100	175	UNSAT	13.9	16.9	-	-	-	-	-	19.6
2024 Cifar100	176	?	-	-	-	-	-	-	-	-
2024 Cifar100	177	UNSAT	35.3	114	-	-	-	-	-	-
2024 Cifar100	178	?	-	-	-	-	-	-	-	-
2024 Cifar100	179	?	-	-	-	-	-	-	-	-
2024 Cifar100	180	UNSAT	21.9	31.5	-	-	-	-	-	-
2024 Cifar100	181	?	-	-	-	-	-	-	-	-
2024 Cifar100	182	UNSAT	24.6	-	-	-	-	-	-	62.6
2024 Cifar100	183	UNSAT	24.1	-	-	-	-	-	-	69.1
2024 Cifar100	184	UNSAT	9.52	6.56	5.11	-	-	-	-	-
2024 Cifar100	185	UNSAT	22.5	83.9	-	-	-	-	-	60.2
2024 Cifar100	186	UNSAT	24.5	-	-	-	-	-	-	70.4
2024 Cifar100	187	UNSAT	28.0	-	-	-	-	-	-	60.0
2024 Cifar100	188	UNSAT	10.3	6.51	3.10	-	-	-	-	-
2024 Cifar100	189	UNSAT	10.1	6.52	4.11	-	-	-	-	X
2024 Cifar100	190	UNSAT	12.9	17.9	-	-	-	-	-	-
2024 Cifar100	191	UNSAT	21.8	61.3	-	-	-	-	-	-
2024 Cifar100	192	UNSAT	75.3	-	-	-	-	-	-	-
2024 Cifar100	193	UNSAT	9.63	6.49	4.11	-	-	-	-	X
2024 Cifar100	194	?	-	-	-	-	-	-	-	-
2024 Cifar100	195	UNSAT	24.3	55.6	-	-	-	-	-	68.6

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Cifar100	196	UNSAT	32.3	-	-	-	-	-	-	-
2024 Cifar100	197	UNSAT	23.8	-	-	-	-	-	-	-
2024 Cifar100	198	UNSAT	23.7	-	-	-	-	-	-	-
2024 Cifar100	199	UNSAT	24.0	-	-	-	-	-	-	63.7
2024 Collins Rul Cnn 2023 0	UNSAT	8.71	3.85	6.09	1.71	25.8	-	-	-	2.13
2024 Collins Rul Cnn 2023 1	UNSAT	7.14	3.62	1.09	1.81	24.6	-	11.6	X	-
2024 Collins Rul Cnn 2023 2	UNSAT	8.75	3.82	6.09	1.86	25.3	-	-	-	2.12
2024 Collins Rul Cnn 2023 3	UNSAT	8.69	3.81	6.09	1.92	25.8	-	-	-	2.13
2024 Collins Rul Cnn 2023 4	UNSAT	8.71	3.81	6.09	1.83	26.3	-	-	-	2.13
2024 Collins Rul Cnn 2023 5	UNSAT	7.12	3.62	1.09	1.63	25.3	-	11.6	X	-
2024 Collins Rul Cnn 2023 6	UNSAT	7.15	3.59	1.09	1.72	25.0	-	11.6	X	-
2024 Collins Rul Cnn 2023 7	UNSAT	8.72	3.83	6.09	1.83	25.7	-	-	-	2.15
2024 Collins Rul Cnn 2023 8	UNSAT	8.75	3.78	6.09	1.97	26.0	-	-	-	2.12
2024 Collins Rul Cnn 2023 9	UNSAT	7.11	3.60	1.09	1.73	24.5	-	11.7	X	-
2024 Collins Rul Cnn 2023 10	UNSAT	7.10	3.59	1.09	1.68	24.4	-	11.6	X	-
2024 Collins Rul Cnn 2023 11	UNSAT	7.13	3.59	1.09	1.71	24.5	-	11.6	X	-
2024 Collins Rul Cnn 2023 12	UNSAT	8.69	3.82	6.09	1.72	26.2	-	-	-	2.13
2024 Collins Rul Cnn 2023 13	UNSAT	8.71	3.81	6.09	1.65	25.6	-	-	-	2.13
2024 Collins Rul Cnn 2023 14	UNSAT	8.73	3.78	6.09	1.62	26.0	-	-	-	2.14
2024 Collins Rul Cnn 2023 15	UNSAT	7.12	3.58	1.09	1.72	24.4	-	11.7	X	-
2024 Collins Rul Cnn 2023 16	UNSAT	7.12	3.56	1.09	1.60	25.0	-	-	-	X
2024 Collins Rul Cnn 2023 17	UNSAT	8.70	3.89	7.10	1.79	25.7	-	-	-	2.28
2024 Collins Rul Cnn 2023 18	UNSAT	8.72	3.83	8.13	1.72	26.0	-	-	-	2.12
2024 Collins Rul Cnn 2023 19	UNSAT	7.15	3.61	1.09	1.75	24.6	-	X	X	-
2024 Collins Rul Cnn 2023 20	UNSAT	7.57	-	1.09	7.21	24.1	-	11.7	X	-
2024 Collins Rul Cnn 2023 21	UNSAT	7.15	3.66	1.09	1.84	24.4	-	11.6	X	-
2024 Collins Rul Cnn 2023 22	UNSAT	7.11	3.61	1.09	1.67	25.7	-	11.6	X	-
2024 Collins Rul Cnn 2023 23	UNSAT	7.12	3.60	1.10	1.75	24.6	-	X	X	-
2024 Collins Rul Cnn 2023 24	UNSAT	8.71	3.81	7.09	1.71	26.9	-	-	-	2.31
2024 Collins Rul Cnn 2023 25	UNSAT	8.76	3.85	7.10	1.61	26.9	-	-	-	2.17
2024 Collins Rul Cnn 2023 26	UNSAT	7.11	3.63	1.09	1.75	24.6	-	11.6	X	-
2024 Collins Rul Cnn 2023 27	UNSAT	7.11	3.62	1.09	1.90	24.7	-	11.7	X	-
2024 Collins Rul Cnn 2023 28	UNSAT	7.13	3.60	1.09	1.77	24.4	-	11.6	X	-
2024 Collins Rul Cnn 2023 29	UNSAT	8.77	3.82	7.09	1.75	26.2	-	-	-	2.17
2024 Collins Rul Cnn 2023 30	UNSAT	8.70	3.92	7.10	1.65	26.4	-	-	-	2.16
2024 Collins Rul Cnn 2023 31	UNSAT	7.11	3.67	1.09	1.75	24.3	-	11.7	X	-
2024 Collins Rul Cnn 2023 32	UNSAT	7.13	3.58	1.09	1.79	24.3	-	X	X	-
2024 Collins Rul Cnn 2023 33	UNSAT	7.15	3.58	1.09	1.74	24.6	-	11.6	X	-
2024 Collins Rul Cnn 2023 34	UNSAT	8.75	3.90	12.2	1.83	26.1	-	-	-	2.17
2024 Collins Rul Cnn 2023 35	UNSAT	8.74	3.81	11.2	1.67	26.2	-	-	-	2.17
2024 Collins Rul Cnn 2023 36	UNSAT	8.73	3.89	11.2	1.77	26.3	-	-	-	2.18
2024 Collins Rul Cnn 2023 37	UNSAT	7.13	3.57	1.09	1.66	24.4	-	11.7	X	-
2024 Collins Rul Cnn 2023 38	UNSAT	7.14	3.60	1.09	1.85	25.3	-	11.6	X	-
2024 Collins Rul Cnn 2023 39	UNSAT	8.75	3.85	7.10	1.75	26.0	-	-	-	2.17
2024 Collins Rul Cnn 2023 40	UNSAT	8.74	3.89	11.2	1.90	25.9	-	-	-	2.32
2024 Collins Rul Cnn 2023 41	UNSAT	7.87	-	1.09	12.4	24.4	-	11.6	X	-
2024 Collins Rul Cnn 2023 42	UNSAT	7.12	3.62	1.09	1.78	24.4	-	11.7	X	-
2024 Collins Rul Cnn 2023 43	UNSAT	8.77	3.91	12.1	1.71	26.1	-	-	-	3.04
2024 Collins Rul Cnn 2023 44	UNSAT	7.12	3.66	1.09	1.76	24.9	-	X	X	-
2024 Collins Rul Cnn 2023 45	UNSAT	7.12	3.62	1.09	1.75	24.7	-	X	X	-
2024 Collins Rul Cnn 2023 46	UNSAT	7.12	3.66	1.09	1.82	25.2	-	X	X	-
2024 Collins Rul Cnn 2023 47	UNSAT	7.12	3.66	1.09	1.69	24.7	-	X	X	-
2024 Collins Rul Cnn 2023 48	UNSAT	8.74	3.85	34.7	1.94	25.7	-	-	-	3.05
2024 Collins Rul Cnn 2023 49	UNSAT	7.64	3.73	1.09	3.83	24.8	-	X	X	-
2024 Collins Rul Cnn 2023 50	UNSAT	7.62	-	1.09	4.18	24.7	-	X	X	-
2024 Collins Rul Cnn 2023 51	UNSAT	8.78	3.86	32.6	1.72	25.9	-	-	-	3.18
2024 Collins Rul Cnn 2023 52	UNSAT	8.77	3.92	31.6	1.82	26.3	-	-	-	3.23
2024 Collins Rul Cnn 2023 53	UNSAT	7.12	3.69	1.09	1.84	25.4	-	X	X	-
2024 Collins Rul Cnn 2023 54	UNSAT	8.79	4.15	36.8	1.68	27.0	-	-	-	2.83
2024 Collins Rul Cnn 2023 55	UNSAT	8.79	3.92	35.8	1.68	26.0	-	-	-	3.21
2024 Collins Rul Cnn 2023 56	UNSAT	7.26	3.67	1.09	3.99	24.4	-	-	-	X
2024 Collins Rul Cnn 2023 57	UNSAT	8.76	4.10	33.8	1.63	26.2	-	-	-	2.84
2024 Collins Rul Cnn 2023 58	UNSAT	7.60	-	3.10	4.83	24.5	-	X	X	-
2024 Collins Rul Cnn 2023 59	UNSAT	8.75	3.91	37.8	1.80	26.6	-	-	-	3.02
2024 Collins Rul Cnn 2023 60	UNSAT	8.82	4.14	32.8	1.81	27.0	-	-	-	3.19
2024 Collins Rul Cnn 2023 61	UNSAT	8.76	3.93	36.8	1.71	26.1	-	-	-	3.03
2024 Cora	0	UNSAT	7.44	7.01	3.10	-	-	-	-	X

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Cora	1	?	-	-	-	-	-	-	-	-
2024 Cora	2	UNSAT	7.73	10.0	9.11	1.37	29.4	8.08	13.0	1.97
2024 Cora	3	UNSAT	7.44	6.06	3.10	-	-	3.52	-	X
2024 Cora	4	?	-	-	-	-	-	-	-	-
2024 Cora	5	UNSAT	7.76	10.0	10.1	1.43	29.2	3.50	12.1	1.95
2024 Cora	6	UNSAT	7.42	6.12	3.10	-	-	3.55	-	X
2024 Cora	7	?	-	-	-	-	-	-	-	-
2024 Cora	8	UNSAT	7.70	9.74	9.11	1.34	28.0	3.47	13.0	1.95
2024 Cora	9	UNSAT	7.42	6.19	3.10	-	-	-	-	X
2024 Cora	10	?	-	-	-	-	-	-	-	-
2024 Cora	11	UNSAT	7.73	9.99	9.11	1.32	28.7	8.10	12.1	1.95
2024 Cora	12	UNSAT	7.41	-	3.12	-	-	-	-	X
2024 Cora	13	?	-	-	-	-	-	-	-	-
2024 Cora	14	UNSAT	7.70	9.67	9.13	1.38	27.6	7.66	11.8	1.96
2024 Cora	15	UNSAT	7.42	6.14	3.12	-	-	-	-	X
2024 Cora	16	?	-	-	-	-	-	-	-	-
2024 Cora	17	UNSAT	7.74	9.76	9.10	1.24	28.0	8.39	11.0	1.95
2024 Cora	18	UNSAT	7.44	6.14	3.11	-	-	-	-	X
2024 Cora	19	?	-	-	-	-	-	-	-	-
2024 Cora	20	UNSAT	7.73	9.65	10.1	1.37	27.3	8.12	11.0	1.96
2024 Cora	21	UNSAT	7.41	6.11	3.10	-	-	3.52	-	X
2024 Cora	22	?	-	-	-	-	-	-	-	-
2024 Cora	23	UNSAT	7.75	9.99	10.1	1.32	32.5	3.48	11.4	1.95
2024 Cora	24	UNSAT	7.43	6.08	3.10	-	25.1	3.52	12.2	X
2024 Cora	25	?	-	-	-	-	-	-	-	-
2024 Cora	26	UNSAT	7.72	9.51	9.11	1.39	28.7	7.85	10.9	1.95
2024 Cora	27	UNSAT	7.40	6.10	3.10	-	-	3.56	-	X
2024 Cora	28	UNSAT	7.46	-	3.10	-	-	-	-	X
2024 Cora	29	UNSAT	7.45	10.2	3.10	8.55	-	3.51	-	X
2024 Cora	30	UNSAT	7.07	6.10	1.09	1.37	25.0	-	12.1	X
2024 Cora	31	UNSAT	7.42	-	4.11	-	-	-	-	X
2024 Cora	32	UNSAT	7.72	10.0	11.1	1.28	-	3.47	11.0	1.95
2024 Cora	33	UNSAT	7.42	22.9	3.12	-	-	-	-	X
2024 Cora	34	?	-	-	-	-	-	-	-	-
2024 Cora	35	UNSAT	7.70	9.67	9.11	1.37	27.7	7.81	11.2	1.95
2024 Cora	36	UNSAT	7.45	-	3.10	-	-	-	-	X
2024 Cora	37	?	-	-	-	-	-	-	-	-
2024 Cora	38	UNSAT	8.28	10.1	17.2	8.43	-	-	-	4.20
2024 Cora	39	UNSAT	7.39	6.08	4.11	-	-	-	-	X
2024 Cora	40	?	-	-	-	-	-	-	-	-
2024 Cora	41	UNSAT	7.73	9.41	9.11	1.38	26.7	7.53	12.0	1.98
2024 Cora	42	UNSAT	7.43	6.06	3.10	-	-	-	-	X
2024 Cora	43	UNSAT	7.44	-	3.10	-	-	-	-	X
2024 Cora	44	UNSAT	7.71	10.0	13.1	1.35	-	3.48	11.2	1.95
2024 Cora	45	UNSAT	7.04	6.10	1.09	1.34	25.7	3.51	13.4	X
2024 Cora	46	?	-	-	-	-	-	-	-	-
2024 Cora	47	UNSAT	7.41	6.07	1.09	8.28	25.3	3.53	11.2	X
2024 Cora	48	UNSAT	7.41	6.06	3.10	-	25.1	3.55	12.4	X
2024 Cora	49	?	-	-	-	-	-	-	-	-
2024 Cora	50	UNSAT	7.73	10.1	11.1	1.30	37.2	3.49	13.1	1.96
2024 Cora	51	UNSAT	7.41	6.05	3.10	-	-	3.54	-	X
2024 Cora	52	?	-	-	-	-	-	-	-	-
2024 Cora	53	UNSAT	7.72	9.56	9.11	1.43	27.4	8.11	12.9	1.94
2024 Cora	54	UNSAT	7.42	6.08	3.12	-	-	-	-	X
2024 Cora	55	?	-	-	-	-	-	-	-	-
2024 Cora	56	UNSAT	7.71	9.58	9.13	1.33	27.9	7.82	12.0	1.96
2024 Cora	57	UNSAT	7.43	6.04	3.10	-	-	3.54	-	X
2024 Cora	58	?	-	-	-	-	-	-	-	-
2024 Cora	59	UNSAT	7.71	9.84	9.11	1.37	28.4	7.99	11.9	1.95
2024 Cora	60	UNSAT	7.11	6.17	1.09	-	25.9	-	-	X
2024 Cora	61	UNSAT	7.16	6.20	1.09	-	26.3	-	-	X
2024 Cora	62	UNSAT	7.45	6.23	1.09	-	-	-	-	X
2024 Cora	63	UNSAT	7.09	6.17	1.09	3.58	25.9	-	X	X
2024 Cora	64	UNSAT	7.43	6.16	3.10	-	-	-	-	X
2024 Cora	65	UNSAT	7.46	6.16	3.10	-	-	-	-	X
2024 Cora	66	UNSAT	7.10	6.21	1.09	-	26.1	-	-	X
2024 Cora	67	UNSAT	7.44	6.17	1.09	-	26.3	-	-	X
2024 Cora	68	UNSAT	7.10	6.24	1.09	3.45	27.3	-	-	X

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Cora	69	UNSAT	7.12	6.21	1.09	-	26.0	-	X	X
2024 Cora	70	UNSAT	7.46	6.25	2.09	-	25.7	-	X	X
2024 Cora	71	UNSAT	7.12	6.20	1.09	-	25.7	-	X	X
2024 Cora	72	UNSAT	7.13	6.21	1.09	-	25.9	-	-	X
2024 Cora	73	UNSAT	7.11	6.20	1.09	-	26.2	-	-	X
2024 Cora	74	UNSAT	7.43	6.20	3.10	-	-	-	-	X
2024 Cora	75	UNSAT	7.44	6.19	3.10	-	-	-	-	X
2024 Cora	76	UNSAT	7.11	6.19	1.09	-	-	-	X	X
2024 Cora	77	UNSAT	7.46	6.20	3.10	-	-	-	X	X
2024 Cora	78	UNSAT	7.11	6.22	1.09	-	26.1	-	X	X
2024 Cora	79	UNSAT	7.44	6.17	3.10	-	-	-	X	X
2024 Cora	80	UNSAT	7.48	6.17	3.10	-	-	-	X	X
2024 Cora	81	UNSAT	7.13	6.25	1.09	-	26.2	-	X	X
2024 Cora	82	UNSAT	7.10	6.12	1.09	-	26.0	-	X	X
2024 Cora	83	UNSAT	7.41	6.18	3.10	-	-	-	-	X
2024 Cora	84	UNSAT	7.12	6.25	1.09	-	26.5	-	-	X
2024 Cora	85	UNSAT	7.13	6.15	1.09	-	26.4	-	-	X
2024 Cora	86	UNSAT	7.45	6.19	3.10	-	-	-	-	X
2024 Cora	87	UNSAT	7.10	6.16	1.09	-	25.9	-	X	X
2024 Cora	88	UNSAT	7.11	6.22	1.09	-	25.9	-	-	X
2024 Cora	89	UNSAT	7.43	6.23	2.09	-	26.2	-	-	X
2024 Cora	90	UNSAT	7.12	6.17	1.09	-	26.0	-	-	X
2024 Cora	91	UNSAT	7.10	6.14	1.09	-	26.0	-	-	X
2024 Cora	92	UNSAT	7.12	6.17	1.09	-	25.6	-	-	X
2024 Cora	93	UNSAT	7.14	6.16	1.09	-	26.3	-	-	X
2024 Cora	94	UNSAT	7.10	6.18	1.09	-	26.3	-	-	X
2024 Cora	95	UNSAT	7.45	6.22	3.10	-	-	-	-	X
2024 Cora	96	UNSAT	7.08	6.20	1.09	-	26.4	-	X	X
2024 Cora	97	UNSAT	7.43	6.25	3.10	-	-	-	X	X
2024 Cora	98	UNSAT	7.11	6.15	1.09	-	25.8	-	-	X
2024 Cora	99	UNSAT	7.13	6.18	1.09	-	26.1	-	X	X
2024 Cora	100	UNSAT	7.44	6.16	3.10	-	26.3	-	X	X
2024 Cora	101	UNSAT	7.44	6.13	3.10	-	26.1	-	X	X
2024 Cora	102	UNSAT	7.12	6.18	1.09	-	25.6	-	X	X
2024 Cora	103	UNSAT	7.11	6.22	1.09	-	25.9	-	-	X
2024 Cora	104	UNSAT	7.44	6.14	3.10	-	-	-	-	X
2024 Cora	105	UNSAT	7.13	6.18	1.09	-	25.7	-	X	X
2024 Cora	106	UNSAT	7.10	6.20	1.09	-	25.9	-	-	X
2024 Cora	107	UNSAT	7.44	6.18	3.10	-	-	-	-	X
2024 Cora	108	UNSAT	7.10	6.22	1.09	-	27.6	-	-	X
2024 Cora	109	UNSAT	7.43	6.18	3.10	-	-	-	-	X
2024 Cora	110	UNSAT	7.42	6.18	3.10	-	-	-	-	X
2024 Cora	111	UNSAT	7.11	6.22	1.09	-	26.9	-	X	X
2024 Cora	112	UNSAT	7.11	6.18	1.09	-	26.3	-	-	X
2024 Cora	113	UNSAT	7.44	6.18	3.10	-	-	-	-	X
2024 Cora	114	UNSAT	7.12	6.16	1.10	-	26.4	-	X	X
2024 Cora	115	UNSAT	7.11	6.19	1.09	-	26.5	-	-	X
2024 Cora	116	UNSAT	7.43	6.16	3.10	-	-	-	-	X
2024 Cora	117	UNSAT	7.11	6.16	1.09	-	26.0	-	-	X
2024 Cora	118	UNSAT	7.12	6.23	1.09	-	27.0	-	X	X
2024 Cora	119	UNSAT	7.45	6.20	3.10	-	-	-	X	X
2024 Cora	120	UNSAT	7.46	6.12	3.10	-	-	-	X	X
2024 Cora	121	UNSAT	7.45	6.22	3.10	-	-	-	X	X
2024 Cora	122	UNSAT	7.46	6.20	3.10	-	-	-	X	X
2024 Cora	123	UNSAT	7.43	6.20	3.10	-	-	-	-	X
2024 Cora	124	UNSAT	7.42	6.16	3.10	-	-	-	X	X
2024 Cora	125	UNSAT	7.44	6.19	3.10	-	-	-	13.3	X
2024 Cora	126	UNSAT	7.46	6.20	3.10	-	-	-	X	X
2024 Cora	127	UNSAT	7.45	6.19	3.10	-	-	-	X	X
2024 Cora	128	UNSAT	7.45	6.16	3.10	-	-	-	-	X
2024 Cora	129	UNSAT	7.45	6.21	3.10	-	-	-	X	X
2024 Cora	130	UNSAT	7.44	6.20	3.10	-	-	-	X	X
2024 Cora	131	UNSAT	7.44	6.20	3.10	-	-	-	-	X
2024 Cora	132	UNSAT	7.43	6.17	3.10	-	-	-	-	X
2024 Cora	133	UNSAT	7.42	6.22	3.10	-	-	-	-	X
2024 Cora	134	UNSAT	-	-	-	-	-	-	X	-
2024 Cora	135	UNSAT	7.44	6.17	3.10	-	-	-	X	X
2024 Cora	136	UNSAT	7.44	6.17	3.10	-	-	-	X	X

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Cora	137	UNSAT	10.2	22.3	32.3	-	-	-	-	9.01
2024 Cora	138	UNSAT	7.47	6.20	3.10	-	-	-	-	X
2024 Cora	139	UNSAT	7.44	6.20	3.10	-	-	-	-	X
2024 Cora	140	UNSAT	7.46	6.16	3.12	-	-	-	12.4	X
2024 Cora	141	UNSAT	7.11	6.18	1.09	-	26.5	-	X	X
2024 Cora	142	UNSAT	-	-	-	-	-	-	X	-
2024 Cora	143	UNSAT	7.47	6.18	3.10	-	-	-	X	X
2024 Cora	144	UNSAT	7.45	6.13	3.10	-	-	-	-	X
2024 Cora	145	?	-	-	-	-	-	-	-	-
2024 Cora	146	UNSAT	7.45	6.11	3.10	-	-	-	X	X
2024 Cora	147	UNSAT	7.43	6.15	3.10	-	-	-	-	X
2024 Cora	148	UNSAT	7.44	6.15	3.10	-	-	-	-	X
2024 Cora	149	UNSAT	7.43	6.15	3.10	-	-	-	X	X
2024 Cora	150	UNSAT	7.44	-	3.10	-	-	-	-	X
2024 Cora	151	UNSAT	7.44	6.19	3.10	-	-	-	X	X
2024 Cora	152	UNSAT	8.40	10.2	19.2	29.8	-	-	X	4.69
2024 Cora	153	UNSAT	7.42	6.14	3.10	-	-	-	-	X
2024 Cora	154	UNSAT	7.44	6.14	3.10	-	-	-	-	X
2024 Cora	155	UNSAT	7.42	6.11	3.10	-	-	-	-	X
2024 Cora	156	UNSAT	7.45	6.17	3.10	-	-	-	X	X
2024 Cora	157	UNSAT	7.43	6.16	3.10	-	-	-	X	X
2024 Cora	158	UNSAT	7.50	6.17	3.10	-	-	-	-	X
2024 Cora	159	UNSAT	7.43	6.19	3.10	-	-	-	-	X
2024 Cora	160	UNSAT	7.43	6.22	3.10	-	-	-	-	X
2024 Cora	161	UNSAT	11.0	-	-	-	-	-	13.0	15.8
2024 Cora	162	UNSAT	7.46	6.15	3.10	-	-	-	X	X
2024 Cora	163	UNSAT	7.44	6.17	3.10	-	-	-	X	X
2024 Cora	164	UNSAT	24.8	-	-	-	-	-	-	-
2024 Cora	165	UNSAT	7.46	6.17	3.10	-	-	-	X	X
2024 Cora	166	UNSAT	7.44	6.17	3.10	-	-	-	X	X
2024 Cora	167	UNSAT	7.44	6.16	3.10	-	-	-	X	X
2024 Cora	168	UNSAT	7.44	6.18	3.10	-	-	-	X	X
2024 Cora	169	UNSAT	7.46	6.13	3.13	-	-	-	X	X
2024 Cora	170	UNSAT	7.44	6.27	3.11	-	26.3	-	-	X
2024 Cora	171	UNSAT	-	-	-	-	-	-	X	-
2024 Cora	172	UNSAT	-	-	-	-	-	-	X	-
2024 Cora	173	UNSAT	7.87	10.3	25.2	-	-	-	X	2.51
2024 Cora	174	UNSAT	7.43	6.19	4.11	-	-	-	-	X
2024 Cora	175	UNSAT	7.43	6.14	3.10	-	-	-	-	X
2024 Cora	176	UNSAT	7.89	10.2	18.2	3.74	-	-	12.4	2.52
2024 Cora	177	UNSAT	7.43	6.18	3.10	-	-	-	-	X
2024 Cora	178	UNSAT	7.41	6.19	3.10	-	-	-	-	X
2024 Cora	179	UNSAT	7.44	6.12	3.10	-	-	-	X	X
2024 Dist Shift 2023	0	UNSAT	8.63	3.87	30.2	-	88.9	-	12.7	-
2024 Dist Shift 2023	1	UNSAT	7.87	3.86	7.10	-	91.7	-	12.3	-
2024 Dist Shift 2023	2	UNSAT	11.4	4.38	7.10	-	-	-	11.5	-
2024 Dist Shift 2023	3	UNSAT	7.91	3.73	7.10	-	85.3	-	12.4	-
2024 Dist Shift 2023	4	UNSAT	7.95	3.76	7.10	-	85.9	-	12.3	-
2024 Dist Shift 2023	5	UNSAT	8.67	3.82	7.10	-	89.3	-	12.3	-
2024 Dist Shift 2023	6	UNSAT	8.75	3.74	7.10	-	-	-	11.2	-
2024 Dist Shift 2023	7	UNSAT	7.92	3.82	8.10	-	85.6	-	12.6	-
2024 Dist Shift 2023	8	UNSAT	7.88	3.72	7.10	-	85.3	-	13.4	-
2024 Dist Shift 2023	9	UNSAT	12.8	5.60	7.10	-	-	-	42.6	-
2024 Dist Shift 2023	10	UNSAT	11.4	3.79	26.2	-	90.3	-	12.2	-
2024 Dist Shift 2023	11	UNSAT	8.72	3.72	7.10	-	93.3	-	11.4	-
2024 Dist Shift 2023	12	UNSAT	11.4	3.77	36.3	-	86.3	-	14.0	-
2024 Dist Shift 2023	13	UNSAT	7.91	3.81	7.10	-	89.0	-	11.5	-
2024 Dist Shift 2023	14	UNSAT	7.89	3.83	7.10	-	86.6	-	13.8	-
2024 Dist Shift 2023	15	UNSAT	8.70	3.76	7.10	-	90.3	-	13.1	-
2024 Dist Shift 2023	16	UNSAT	7.14	3.85	1.09	-	25.4	-	12.7	-
2024 Dist Shift 2023	17	UNSAT	7.87	3.84	7.10	-	86.5	-	12.2	-
2024 Dist Shift 2023	18	UNSAT	7.15	3.67	1.09	-	25.8	-	13.6	-
2024 Dist Shift 2023	19	UNSAT	8.73	4.44	62.5	-	89.0	-	11.9	-
2024 Dist Shift 2023	20	UNSAT	12.3	4.14	338	-	91.6	-	13.0	-
2024 Dist Shift 2023	21	UNSAT	7.88	3.89	10.1	-	86.4	-	12.4	-
2024 Dist Shift 2023	22	UNSAT	7.11	3.67	1.09	-	25.7	-	12.4	-
2024 Dist Shift 2023	23	UNSAT	7.93	3.80	8.10	-	115	-	12.4	-
2024 Dist Shift 2023	24	UNSAT	7.90	3.74	7.10	-	86.8	-	12.4	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Dist Shift 2023	25	UNSAT	11.4	3.78	7.10	-	-	-	12.4	-
2024 Dist Shift 2023	26	UNSAT	11.4	4.14	51.4	-	-	-	13.6	-
2024 Dist Shift 2023	27	UNSAT	8.73	3.77	7.10	-	87.8	-	12.7	-
2024 Dist Shift 2023	28	UNSAT	7.89	3.75	7.10	-	99.6	-	13.2	-
2024 Dist Shift 2023	29	UNSAT	7.85	3.78	7.10	-	87.4	-	12.3	-
2024 Dist Shift 2023	30	UNSAT	7.88	3.82	7.10	-	85.0	-	12.2	-
2024 Dist Shift 2023	31	UNSAT	8.57	3.84	7.10	-	85.8	-	13.5	-
2024 Dist Shift 2023	32	UNSAT	11.1	155	7.10	-	-	-	16.0	-
2024 Dist Shift 2023	33	UNSAT	11.4	4.22	-	-	98.5	-	12.6	-
2024 Dist Shift 2023	34	UNSAT	7.89	3.75	7.09	-	89.9	-	12.4	-
2024 Dist Shift 2023	35	UNSAT	7.87	3.80	7.10	-	87.4	-	12.7	-
2024 Dist Shift 2023	36	UNSAT	8.60	3.81	17.2	-	87.8	-	12.4	-
2024 Dist Shift 2023	37	UNSAT	7.10	21.8	7.09	-	-	-	20.2	-
2024 Dist Shift 2023	38	UNSAT	7.91	3.84	7.10	-	87.7	-	11.4	-
2024 Dist Shift 2023	39	UNSAT	8.67	3.82	7.10	-	86.7	-	12.6	-
2024 Dist Shift 2023	40	UNSAT	8.69	3.84	7.10	-	87.7	-	11.5	-
2024 Dist Shift 2023	41	UNSAT	7.89	3.73	7.10	-	85.7	-	11.1	-
2024 Dist Shift 2023	42	UNSAT	7.86	3.77	7.10	-	91.3	-	13.3	-
2024 Dist Shift 2023	43	UNSAT	7.89	3.76	7.10	-	89.9	-	12.1	-
2024 Dist Shift 2023	44	UNSAT	8.57	3.80	42.4	-	86.1	-	12.4	-
2024 Dist Shift 2023	45	UNSAT	7.91	3.81	7.10	-	88.1	-	12.3	-
2024 Dist Shift 2023	46	UNSAT	8.76	4.07	7.10	-	-	-	11.5	-
2024 Dist Shift 2023	47	UNSAT	7.87	3.78	7.10	-	84.2	-	12.2	-
2024 Dist Shift 2023	48	UNSAT	7.14	3.97	1.09	-	26.4	-	12.8	-
2024 Dist Shift 2023	49	UNSAT	7.90	3.89	9.11	-	85.9	-	12.3	-
2024 Dist Shift 2023	50	UNSAT	7.93	3.79	7.10	-	86.6	-	12.3	-
2024 Dist Shift 2023	51	UNSAT	8.73	3.75	7.10	-	92.2	-	14.0	-
2024 Dist Shift 2023	52	UNSAT	7.87	3.77	8.10	-	87.5	-	11.4	-
2024 Dist Shift 2023	53	UNSAT	7.89	3.75	8.10	-	87.5	-	12.7	-
2024 Dist Shift 2023	54	UNSAT	8.59	3.72	52.5	-	88.7	-	11.3	-
2024 Dist Shift 2023	55	UNSAT	11.4	4.37	7.10	-	-	-	13.7	-
2024 Dist Shift 2023	56	UNSAT	7.87	3.85	10.1	-	87.1	-	11.4	-
2024 Dist Shift 2023	57	UNSAT	8.58	3.82	7.10	-	91.4	-	12.6	-
2024 Dist Shift 2023	58	UNSAT	7.89	3.79	7.10	-	86.4	-	13.7	-
2024 Dist Shift 2023	59	UNSAT	11.4	4.42	-	-	-	-	12.4	-
2024 Dist Shift 2023	60	UNSAT	7.87	3.85	7.10	-	85.9	-	12.5	-
2024 Dist Shift 2023	61	UNSAT	8.53	3.78	7.10	-	87.9	-	13.4	-
2024 Dist Shift 2023	62	UNSAT	7.12	3.94	1.09	-	25.6	-	12.5	-
2024 Dist Shift 2023	63	UNSAT	7.88	3.88	7.10	-	85.6	-	12.3	-
2024 Dist Shift 2023	64	UNSAT	7.87	3.88	7.10	-	91.2	-	11.3	-
2024 Dist Shift 2023	65	UNSAT	12.9	4.83	44.4	-	-	-	87.7	-
2024 Dist Shift 2023	66	UNSAT	11.4	4.11	7.10	-	-	-	13.5	-
2024 Dist Shift 2023	67	UNSAT	8.69	4.08	7.10	-	-	-	13.5	-
2024 Dist Shift 2023	68	UNSAT	7.88	3.82	7.10	-	88.6	-	12.3	-
2024 Dist Shift 2023	69	UNSAT	12.2	4.71	7.10	-	-	-	12.4	-
2024 Dist Shift 2023	70	?	-	-	-	-	-	-	-	-
2024 Dist Shift 2023	71	UNSAT	7.16	20.7	2.09	-	-	-	19.0	-
2024 Linearizenn	0	UNSAT	7.15	9.30	1.09	X	-	-	-	-
2024 Linearizenn	1	UNSAT	8.89	3.91	6.10	1.91	-	-	-	-
2024 Linearizenn	2	UNSAT	7.25	4.14	6.09	1.90	-	-	-	-
2024 Linearizenn	3	UNSAT	7.27	3.59	6.09	2.10	-	-	-	-
2024 Linearizenn	4	UNSAT	7.32	3.87	6.09	2.11	-	-	-	-
2024 Linearizenn	5	UNSAT	7.28	3.85	6.10	2.04	-	-	-	-
2024 Linearizenn	6	UNSAT	10.0	6.02	6.10	2.86	-	-	-	-
2024 Linearizenn	7	UNSAT	7.26	4.41	6.10	2.39	-	-	-	-
2024 Linearizenn	8	UNSAT	7.28	3.57	6.10	2.15	-	-	-	-
2024 Linearizenn	9	UNSAT	9.33	4.39	6.10	2.55	-	-	-	-
2024 Linearizenn	10	UNSAT	7.27	4.44	6.10	2.34	-	-	-	-
2024 Linearizenn	11	UNSAT	7.27	3.86	6.09	2.11	-	-	-	-
2024 Linearizenn	12	UNSAT	10.7	9.48	6.10	9.85	-	-	-	-
2024 Linearizenn	13	UNSAT	10.1	6.24	6.10	5.22	-	-	-	-
2024 Linearizenn	14	UNSAT	10.2	6.42	6.10	5.50	-	-	-	-
2024 Linearizenn	15	UNSAT	10.1	6.63	6.09	5.63	-	-	-	-
2024 Linearizenn	16	UNSAT	9.73	5.68	6.10	4.29	-	-	-	-
2024 Linearizenn	17	UNSAT	10.1	6.18	6.10	5.24	-	-	-	-
2024 Linearizenn	18	UNSAT	11.0	11.4	6.10	4.70	-	-	-	-
2024 Linearizenn	19	UNSAT	9.88	6.62	6.09	3.18	-	-	-	-
2024 Linearizenn	20	UNSAT	9.84	7.29	6.10	3.20	-	-	-	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Linearizenn	21	UNSAT	10.1	6.98	6.10	3.51	-	-	-	-
2024 Linearizenn	22	UNSAT	9.56	6.03	6.09	3.12	-	-	-	-
2024 Linearizenn	23	UNSAT	9.90	7.21	6.10	3.44	-	-	-	-
2024 Linearizenn	24	UNSAT	11.1	22.6	6.10	9.31	-	-	-	-
2024 Linearizenn	25	UNSAT	10.9	13.6	6.10	5.99	-	-	-	-
2024 Linearizenn	26	UNSAT	10.5	12.2	6.10	6.02	-	-	-	-
2024 Linearizenn	27	UNSAT	10.0	7.89	6.10	3.47	-	-	-	-
2024 Linearizenn	28	UNSAT	10.2	9.88	6.10	4.37	-	-	-	-
2024 Linearizenn	29	UNSAT	10.5	8.45	6.09	4.29	-	-	-	-
2024 Linearizenn	30	UNSAT	11.3	27.3	6.10	20.4	-	-	-	-
2024 Linearizenn	31	UNSAT	10.7	17.6	6.09	10.8	-	-	-	-
2024 Linearizenn	32	UNSAT	10.4	13.0	6.10	8.12	-	-	-	-
2024 Linearizenn	33	UNSAT	10.1	11.0	6.10	7.41	-	-	-	-
2024 Linearizenn	34	UNSAT	10.2	9.68	6.10	5.56	-	-	-	-
2024 Linearizenn	35	UNSAT	10.6	16.7	6.09	12.9	-	-	-	-
2024 Linearizenn	36	UNSAT	10.9	10.5	6.09	11.0	-	-	-	-
2024 Linearizenn	37	UNSAT	9.78	6.18	6.10	4.63	-	-	-	-
2024 Linearizenn	38	UNSAT	9.90	6.16	6.10	3.80	-	-	-	-
2024 Linearizenn	39	UNSAT	9.91	6.33	6.09	3.37	-	-	-	-
2024 Linearizenn	40	UNSAT	9.53	5.02	6.10	2.81	-	-	-	-
2024 Linearizenn	41	UNSAT	9.65	5.02	6.10	2.74	-	-	-	-
2024 Linearizenn	42	UNSAT	11.1	15.2	6.09	9.39	-	-	-	-
2024 Linearizenn	43	UNSAT	10.4	9.48	6.10	5.79	-	-	-	-
2024 Linearizenn	44	UNSAT	10.0	8.63	6.09	5.52	-	-	-	-
2024 Linearizenn	45	UNSAT	10.6	10.1	6.10	6.57	-	-	-	-
2024 Linearizenn	46	UNSAT	10.4	8.80	6.09	5.97	-	-	-	-
2024 Linearizenn	47	UNSAT	10.6	10.3	6.10	6.53	-	-	-	-
2024 Linearizenn	48	UNSAT	10.6	8.56	6.10	6.79	-	-	-	-
2024 Linearizenn	49	UNSAT	10.1	6.31	6.09	3.03	-	-	-	-
2024 Linearizenn	50	UNSAT	9.88	5.71	6.09	2.99	-	-	-	-
2024 Linearizenn	51	UNSAT	9.63	5.11	6.10	2.59	-	-	-	-
2024 Linearizenn	52	UNSAT	9.99	5.48	6.09	2.80	-	-	-	-
2024 Linearizenn	53	UNSAT	9.91	5.27	6.10	2.93	-	-	-	-
2024 Linearizenn	54	UNSAT	9.95	5.11	6.10	2.16	-	-	-	-
2024 Linearizenn	55	UNSAT	7.25	3.63	6.10	1.92	-	-	-	-
2024 Linearizenn	56	UNSAT	8.94	4.14	6.09	2.02	-	-	-	-
2024 Linearizenn	57	UNSAT	8.99	4.12	6.10	2.06	-	-	-	-
2024 Linearizenn	58	UNSAT	8.95	3.90	6.10	2.08	-	-	-	-
2024 Linearizenn	59	UNSAT	8.97	4.44	6.10	2.15	-	-	-	-
2024 Metaroom 2023	0	UNSAT	8.03	15.1	-	2.71	29.1	-	-	7.22
2024 Metaroom 2023	1	UNSAT	7.86	13.2	-	-	27.2	-	-	7.15
2024 Metaroom 2023	2	UNSAT	7.60	9.86	8.10	-	25.6	-	-	4.19
2024 Metaroom 2023	3	UNSAT	8.17	14.3	-	3.07	30.6	-	-	7.86
2024 Metaroom 2023	4	UNSAT	7.63	9.89	8.10	-	26.0	-	-	4.18
2024 Metaroom 2023	5	UNSAT	7.89	13.0	-	-	25.9	-	-	7.33
2024 Metaroom 2023	6	UNSAT	7.79	9.93	8.10	2.15	29.0	-	-	4.36
2024 Metaroom 2023	7	UNSAT	8.11	16.0	-	3.83	29.5	-	-	7.03
2024 Metaroom 2023	8	UNSAT	7.57	9.78	8.10	-	25.4	-	-	4.18
2024 Metaroom 2023	9	UNSAT	7.61	9.81	8.10	-	25.6	-	-	4.18
2024 Metaroom 2023	10	UNSAT	7.60	9.85	8.10	-	25.5	-	-	4.18
2024 Metaroom 2023	11	UNSAT	7.88	12.8	-	-	26.3	-	-	7.19
2024 Metaroom 2023	12	UNSAT	7.81	13.2	-	-	26.8	-	-	7.50
2024 Metaroom 2023	13	UNSAT	7.87	13.1	-	-	27.2	-	-	6.81
2024 Metaroom 2023	14	UNSAT	7.60	9.94	8.10	1.89	28.6	-	-	4.21
2024 Metaroom 2023	15	UNSAT	7.87	12.9	-	-	26.5	-	-	6.83
2024 Metaroom 2023	16	UNSAT	7.60	9.90	8.10	1.85	28.2	-	-	4.19
2024 Metaroom 2023	17	UNSAT	7.58	9.88	8.10	-	26.5	-	-	4.22
2024 Metaroom 2023	18	UNSAT	7.61	9.80	8.10	-	26.6	-	-	4.23
2024 Metaroom 2023	19	UNSAT	8.25	13.6	-	2.68	30.2	-	-	7.82
2024 Metaroom 2023	20	UNSAT	7.85	9.96	8.10	1.99	28.3	-	-	4.53
2024 Metaroom 2023	21	UNSAT	8.03	13.5	-	2.79	28.9	-	-	7.48
2024 Metaroom 2023	22	UNSAT	7.60	9.85	8.10	1.80	28.2	-	-	4.18
2024 Metaroom 2023	23	UNSAT	7.89	12.6	-	-	26.4	-	-	7.25
2024 Metaroom 2023	24	UNSAT	7.63	9.77	8.10	-	25.5	-	-	4.18
2024 Metaroom 2023	25	UNSAT	8.24	13.3	-	2.83	29.5	-	-	7.19
2024 Metaroom 2023	26	UNSAT	7.94	13.3	-	3.04	29.2	-	-	7.18
2024 Metaroom 2023	27	UNSAT	8.12	13.8	-	2.75	30.2	-	-	7.16
2024 Metaroom 2023	28	UNSAT	12.0	10.2	8.10	3.91	29.1	-	-	4.84



Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Metaroom 2023	29	UNSAT	8.64	145	30.2	-	-	-	-	X
2024 Metaroom 2023	30	UNSAT	8.26	14.1	-	2.96	31.0	-	-	7.12
2024 Metaroom 2023	31	UNSAT	7.77	9.84	8.10	1.86	28.6	-	-	4.39
2024 Metaroom 2023	32	UNSAT	7.60	9.81	8.10	-	26.1	-	-	4.19
2024 Metaroom 2023	33	UNSAT	7.64	9.82	8.10	-	25.9	-	-	4.21
2024 Metaroom 2023	34	UNSAT	7.62	9.88	8.10	1.94	28.8	-	-	4.18
2024 Metaroom 2023	35	UNSAT	7.58	9.86	8.10	-	25.9	-	-	4.19
2024 Metaroom 2023	36	UNSAT	8.56	-	12.1	-	-	-	-	X
2024 Metaroom 2023	37	UNSAT	7.77	12.7	-	-	26.4	-	-	7.58
2024 Metaroom 2023	38	UNSAT	7.91	9.95	8.10	1.91	29.7	-	-	4.52
2024 Metaroom 2023	39	UNSAT	8.13	15.7	-	3.78	31.1	-	-	7.05
2024 Metaroom 2023	40	UNSAT	8.04	13.3	-	2.82	29.1	-	-	7.35
2024 Metaroom 2023	41	UNSAT	7.86	13.1	-	-	26.2	-	-	6.95
2024 Metaroom 2023	42	UNSAT	7.65	9.88	8.10	-	25.7	-	-	4.20
2024 Metaroom 2023	43	UNSAT	7.60	9.88	8.10	1.83	28.9	-	-	4.19
2024 Metaroom 2023	44	UNSAT	7.89	13.1	-	-	26.1	-	-	6.69
2024 Metaroom 2023	45	UNSAT	8.23	7.81	1.09	-	26.3	-	-	X
2024 Metaroom 2023	46	UNSAT	7.88	12.6	-	-	26.9	-	-	8.20
2024 Metaroom 2023	47	UNSAT	8.24	8.46	2.09	-	26.4	-	-	X
2024 Metaroom 2023	48	UNSAT	7.88	13.0	-	-	27.3	-	-	6.83
2024 Metaroom 2023	49	UNSAT	8.27	13.5	-	2.86	29.1	-	-	7.28
2024 Metaroom 2023	50	UNSAT	8.15	15.6	-	3.91	30.8	-	-	7.02
2024 Metaroom 2023	51	UNSAT	7.65	9.90	8.10	-	25.9	-	-	4.20
2024 Metaroom 2023	52	UNSAT	7.59	9.80	8.10	-	26.2	-	-	4.18
2024 Metaroom 2023	53	UNSAT	7.80	9.87	8.10	2.03	29.5	-	-	4.37
2024 Metaroom 2023	54	UNSAT	8.04	13.8	-	2.71	29.7	-	-	7.02
2024 Metaroom 2023	55	UNSAT	7.86	13.1	-	-	26.7	-	-	7.23
2024 Metaroom 2023	56	UNSAT	8.05	14.0	-	2.82	29.6	-	-	6.85
2024 Metaroom 2023	57	UNSAT	7.60	9.91	8.10	-	25.8	-	-	4.19
2024 Metaroom 2023	58	UNSAT	7.58	9.86	8.10	1.97	28.7	-	-	4.19
2024 Metaroom 2023	59	UNSAT	8.14	14.1	-	2.95	29.6	-	-	7.03
2024 Metaroom 2023	60	UNSAT	7.89	13.0	-	-	27.5	-	-	6.85
2024 Metaroom 2023	61	UNSAT	7.59	9.86	8.10	-	25.7	-	-	4.18
2024 Metaroom 2023	62	UNSAT	7.99	13.1	-	2.68	29.3	-	-	6.81
2024 Metaroom 2023	63	?	-	-	-	-	-	-	-	-
2024 Metaroom 2023	64	?	-	-	-	-	-	-	-	-
2024 Metaroom 2023	65	UNSAT	7.86	12.9	-	-	26.2	-	-	7.33
2024 Metaroom 2023	66	UNSAT	7.61	9.91	8.10	-	26.9	-	-	4.19
2024 Metaroom 2023	67	UNSAT	7.59	9.81	8.10	2.07	29.5	-	-	4.19
2024 Metaroom 2023	68	UNSAT	7.59	9.85	8.10	1.98	28.8	-	-	4.18
2024 Metaroom 2023	69	UNSAT	7.86	12.7	-	-	26.3	-	-	7.25
2024 Metaroom 2023	70	UNSAT	13.6	21.6	8.10	48.6	-	-	-	66.9
2024 Metaroom 2023	71	UNSAT	7.60	9.80	8.10	2.05	28.1	-	-	4.18
2024 Metaroom 2023	72	UNSAT	7.64	9.81	8.10	-	25.6	-	-	4.21
2024 Metaroom 2023	73	UNSAT	8.27	137	3.10	3.74	-	-	-	X
2024 Metaroom 2023	74	UNSAT	7.59	9.83	8.10	-	26.9	-	-	4.20
2024 Metaroom 2023	75	UNSAT	7.61	9.89	8.10	1.89	29.0	-	-	4.18
2024 Metaroom 2023	76	UNSAT	8.11	14.6	-	2.99	28.8	-	-	7.02
2024 Metaroom 2023	77	UNSAT	7.78	9.89	8.10	2.01	29.0	-	-	4.38
2024 Metaroom 2023	78	UNSAT	7.95	10.2	2.10	4.18	-	-	-	X
2024 Metaroom 2023	79	UNSAT	7.86	13.3	-	-	26.4	-	-	6.68
2024 Metaroom 2023	80	UNSAT	7.60	9.84	8.10	-	25.8	-	-	4.21
2024 Metaroom 2023	81	UNSAT	7.88	13.4	-	-	26.5	-	-	6.63
2024 Metaroom 2023	82	UNSAT	7.84	10.1	8.10	2.11	29.3	-	-	4.26
2024 Metaroom 2023	83	UNSAT	8.13	14.5	-	2.82	29.8	-	-	7.36
2024 Metaroom 2023	84	UNSAT	8.13	14.7	-	2.88	30.0	-	-	7.36
2024 Metaroom 2023	85	UNSAT	8.05	13.5	-	2.80	30.5	-	-	7.74
2024 Metaroom 2023	86	UNSAT	7.87	13.3	-	-	26.1	-	-	6.66
2024 Metaroom 2023	87	UNSAT	8.14	14.4	-	3.08	29.2	-	-	6.99
2024 Metaroom 2023	88	UNSAT	7.58	9.85	8.10	-	25.8	-	-	4.22
2024 Metaroom 2023	89	UNSAT	7.88	13.4	-	-	27.7	-	-	6.85
2024 Metaroom 2023	90	UNSAT	7.60	9.77	8.10	-	25.5	-	-	4.23
2024 Metaroom 2023	91	UNSAT	7.61	9.81	8.11	1.88	29.0	-	-	4.22
2024 Metaroom 2023	92	UNSAT	8.56	36.9	4.11	-	-	-	-	X
2024 Metaroom 2023	93	UNSAT	7.87	13.0	-	-	27.2	-	-	6.79
2024 Metaroom 2023	94	UNSAT	7.88	13.5	-	-	26.8	-	-	6.68
2024 Metaroom 2023	95	UNSAT	7.59	9.86	8.10	-	25.5	-	-	4.20
2024 Metaroom 2023	96	UNSAT	7.74	9.92	8.10	2.07	29.3	-	-	4.35



Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Metaroom 2023	97	UNSAT	7.60	9.90	8.10	-	26.0	-	-	4.20
2024 Metaroom 2023	98	UNSAT	8.13	15.3	-	3.18	30.6	-	-	7.37
2024 Metaroom 2023	99	UNSAT	7.61	9.79	8.10	-	26.1	-	-	4.22
2024 Nn4sys 2023	0	UNSAT	9.17	-	-	-	-	-	-	-
2024 Nn4sys 2023	1	UNSAT	7.82	3.66	6.09	-	-	-	-	-
2024 Nn4sys 2023	2	UNSAT	7.82	3.62	6.09	-	-	-	-	-
2024 Nn4sys 2023	3	UNSAT	7.95	3.77	7.12	-	-	-	-	-
2024 Nn4sys 2023	4	UNSAT	8.60	-	-	-	-	-	-	-
2024 Nn4sys 2023	5	UNSAT	7.84	3.65	6.09	-	-	-	-	-
2024 Nn4sys 2023	6	UNSAT	7.84	3.66	6.09	-	-	-	-	-
2024 Nn4sys 2023	7	UNSAT	9.14	-	-	-	-	-	-	-
2024 Nn4sys 2023	8	UNSAT	8.60	-	-	-	-	-	-	-
2024 Nn4sys 2023	9	UNSAT	8.59	-	-	-	-	-	-	-
2024 Nn4sys 2023	10	UNSAT	7.95	3.63	6.10	-	-	-	-	-
2024 Nn4sys 2023	11	UNSAT	7.98	3.66	6.10	-	-	-	-	-
2024 Nn4sys 2023	12	UNSAT	7.81	3.62	6.10	-	-	-	-	-
2024 Nn4sys 2023	13	UNSAT	7.85	3.60	6.10	-	-	-	-	-
2024 Nn4sys 2023	14	UNSAT	7.96	3.71	7.10	-	-	-	-	-
2024 Nn4sys 2023	15	UNSAT	8.59	-	-	-	-	-	-	-
2024 Nn4sys 2023	16	UNSAT	9.14	-	-	-	-	-	-	-
2024 Nn4sys 2023	17	UNSAT	9.16	-	-	-	-	-	-	-
2024 Nn4sys 2023	18	UNSAT	7.81	3.66	6.09	-	-	-	-	-
2024 Nn4sys 2023	19	UNSAT	7.80	3.70	6.09	-	-	-	-	-
2024 Nn4sys 2023	20	UNSAT	7.97	3.76	7.10	-	-	-	-	-
2024 Nn4sys 2023	21	UNSAT	9.17	-	-	-	-	-	-	-
2024 Nn4sys 2023	22	UNSAT	7.95	3.73	6.09	-	-	-	-	-
2024 Nn4sys 2023	23	UNSAT	7.96	3.77	7.10	-	-	-	-	-
2024 Nn4sys 2023	24	UNSAT	7.84	3.63	6.10	-	-	-	-	-
2024 Nn4sys 2023	25	UNSAT	9.14	-	-	-	-	-	-	-
2024 Nn4sys 2023	26	UNSAT	8.64	-	-	-	-	-	-	-
2024 Nn4sys 2023	27	UNSAT	7.82	3.66	6.09	-	-	-	-	-
2024 Nn4sys 2023	28	UNSAT	7.88	3.66	6.09	-	-	-	-	-
2024 Nn4sys 2023	29	UNSAT	7.95	3.63	6.09	-	-	-	-	-
2024 Nn4sys 2023	30	UNSAT	7.94	3.73	6.09	-	-	-	-	-
2024 Nn4sys 2023	31	UNSAT	7.94	3.71	7.10	-	-	-	-	-
2024 Nn4sys 2023	32	UNSAT	8.56	-	-	-	-	-	-	-
2024 Nn4sys 2023	33	UNSAT	7.97	3.74	6.09	-	-	-	-	-
2024 Nn4sys 2023	34	UNSAT	9.15	-	-	-	-	-	-	-
2024 Nn4sys 2023	35	UNSAT	12.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	36	UNSAT	11.7	-	-	-	-	-	-	-
2024 Nn4sys 2023	37	UNSAT	11.8	-	-	-	-	-	-	-
2024 Nn4sys 2023	38	UNSAT	12.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	39	UNSAT	11.7	-	-	-	-	-	-	-
2024 Nn4sys 2023	40	UNSAT	12.1	-	-	-	-	-	-	-
2024 Nn4sys 2023	41	UNSAT	12.3	-	-	-	-	-	-	-
2024 Nn4sys 2023	42	UNSAT	12.0	-	-	-	-	-	-	-
2024 Nn4sys 2023	43	UNSAT	12.6	-	-	-	-	-	-	-
2024 Nn4sys 2023	44	UNSAT	12.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	45	UNSAT	12.1	-	-	-	-	-	-	-
2024 Nn4sys 2023	46	UNSAT	12.1	-	-	-	-	-	-	-
2024 Nn4sys 2023	47	UNSAT	12.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	48	UNSAT	11.7	-	-	-	-	-	-	-
2024 Nn4sys 2023	49	UNSAT	12.1	-	-	-	-	-	-	-
2024 Nn4sys 2023	50	UNSAT	11.8	-	-	-	-	-	-	-
2024 Nn4sys 2023	51	UNSAT	11.7	-	-	-	-	-	-	-
2024 Nn4sys 2023	52	UNSAT	12.1	-	-	-	-	-	-	-
2024 Nn4sys 2023	53	UNSAT	12.5	-	-	-	-	-	-	-
2024 Nn4sys 2023	54	UNSAT	11.7	-	-	-	-	-	-	-
2024 Nn4sys 2023	55	UNSAT	12.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	56	UNSAT	12.0	-	-	-	-	-	-	-
2024 Nn4sys 2023	57	UNSAT	11.9	-	-	-	-	-	-	-
2024 Nn4sys 2023	58	UNSAT	11.8	-	-	-	-	-	-	-
2024 Nn4sys 2023	59	UNSAT	12.4	-	-	-	-	-	-	-
2024 Nn4sys 2023	60	UNSAT	11.7	-	-	-	-	-	-	-
2024 Nn4sys 2023	61	UNSAT	12.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	62	UNSAT	12.1	-	-	-	-	-	-	-
2024 Nn4sys 2023	63	UNSAT	11.9	-	-	-	-	-	-	-
2024 Nn4sys 2023	64	UNSAT	11.9	-	-	-	-	-	-	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Nn4sys 2023	65	UNSAT	12.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	66	UNSAT	11.9	-	-	-	-	-	-	-
2024 Nn4sys 2023	67	UNSAT	12.0	-	-	-	-	-	-	-
2024 Nn4sys 2023	68	UNSAT	11.9	-	-	-	-	-	-	-
2024 Nn4sys 2023	69	UNSAT	12.5	-	-	-	-	-	-	-
2024 Nn4sys 2023	70	UNSAT	12.4	-	-	-	-	-	-	-
2024 Nn4sys 2023	71	UNSAT	12.4	-	-	-	-	-	-	-
2024 Nn4sys 2023	72	UNSAT	12.8	-	-	-	-	-	-	-
2024 Nn4sys 2023	73	UNSAT	12.5	-	-	-	-	-	-	-
2024 Nn4sys 2023	74	UNSAT	13.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	75	UNSAT	12.9	-	-	-	-	-	-	-
2024 Nn4sys 2023	76	UNSAT	12.6	-	-	-	-	-	-	-
2024 Nn4sys 2023	77	UNSAT	12.5	-	-	-	-	-	-	-
2024 Nn4sys 2023	78	UNSAT	12.4	-	-	-	-	-	-	-
2024 Nn4sys 2023	79	UNSAT	12.4	-	-	-	-	-	-	-
2024 Nn4sys 2023	80	UNSAT	12.4	-	-	-	-	-	-	-
2024 Nn4sys 2023	81	UNSAT	12.5	-	-	-	-	-	-	-
2024 Nn4sys 2023	82	UNSAT	12.7	-	-	-	-	-	-	-
2024 Nn4sys 2023	83	UNSAT	12.4	-	-	-	-	-	-	-
2024 Nn4sys 2023	84	UNSAT	12.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	85	UNSAT	12.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	86	UNSAT	12.5	-	-	-	-	-	-	-
2024 Nn4sys 2023	87	UNSAT	12.8	-	-	-	-	-	-	-
2024 Nn4sys 2023	88	UNSAT	12.3	-	-	-	-	-	-	-
2024 Nn4sys 2023	89	UNSAT	12.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	90	UNSAT	12.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	91	UNSAT	12.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	92	UNSAT	12.5	-	-	-	-	-	-	-
2024 Nn4sys 2023	93	UNSAT	12.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	94	UNSAT	12.5	-	-	-	-	-	-	-
2024 Nn4sys 2023	95	UNSAT	12.4	-	-	-	-	-	-	-
2024 Nn4sys 2023	96	UNSAT	12.3	-	-	-	-	-	-	-
2024 Nn4sys 2023	97	UNSAT	12.5	-	-	-	-	-	-	-
2024 Nn4sys 2023	98	UNSAT	13.3	-	-	-	-	-	-	-
2024 Nn4sys 2023	99	UNSAT	12.5	-	-	-	-	-	-	-
2024 Nn4sys 2023	100	UNSAT	12.3	-	-	-	-	-	-	-
2024 Nn4sys 2023	101	UNSAT	12.4	-	-	-	-	-	-	-
2024 Nn4sys 2023	102	UNSAT	12.8	-	-	-	-	-	-	-
2024 Nn4sys 2023	103	UNSAT	12.8	-	-	-	-	-	-	-
2024 Nn4sys 2023	104	UNSAT	12.8	-	-	-	-	-	-	-
2024 Nn4sys 2023	105	UNSAT	7.08	3.82	6.09	0.95	-	-	12.4	-
2024 Nn4sys 2023	106	UNSAT	7.10	3.87	6.10	0.94	-	-	11.2	-
2024 Nn4sys 2023	107	UNSAT	7.30	8.15	-	1.33	-	-	-	-
2024 Nn4sys 2023	108	UNSAT	7.27	8.79	-	1.46	-	-	-	-
2024 Nn4sys 2023	109	UNSAT	7.29	9.48	-	1.72	-	-	-	-
2024 Nn4sys 2023	110	UNSAT	7.33	9.93	-	1.85	-	-	-	-
2024 Nn4sys 2023	111	UNSAT	7.26	9.72	-	2.11	-	-	-	-
2024 Nn4sys 2023	112	UNSAT	7.26	11.6	-	2.23	-	-	-	-
2024 Nn4sys 2023	113	UNSAT	7.30	10.6	-	2.43	-	-	-	-
2024 Nn4sys 2023	114	UNSAT	7.28	11.0	-	2.56	-	-	-	-
2024 Nn4sys 2023	115	UNSAT	7.41	10.1	-	2.77	-	-	-	-
2024 Nn4sys 2023	116	UNSAT	7.41	11.8	-	3.02	-	-	-	-
2024 Nn4sys 2023	117	UNSAT	7.50	12.8	-	6.55	-	-	-	-
2024 Nn4sys 2023	118	UNSAT	7.55	13.4	-	7.20	-	-	-	-
2024 Nn4sys 2023	119	UNSAT	7.65	14.7	-	10.4	-	-	-	-
2024 Nn4sys 2023	120	UNSAT	7.67	11.9	-	11.4	-	-	-	-
2024 Nn4sys 2023	121	UNSAT	7.71	11.6	-	14.4	-	-	-	-
2024 Nn4sys 2023	122	UNSAT	7.75	18.8	-	15.7	-	-	-	-
2024 Nn4sys 2023	123	UNSAT	7.95	18.7	-	17.7	-	-	-	-
2024 Nn4sys 2023	124	UNSAT	8.04	21.7	-	19.7	-	-	-	-
2024 Nn4sys 2023	125	UNSAT	8.01	12.2	-	19.5	-	-	-	-
2024 Nn4sys 2023	126	UNSAT	8.10	21.1	-	21.7	-	-	-	-
2024 Nn4sys 2023	127	UNSAT	12.0	71.8	-	-	-	-	-	-
2024 Nn4sys 2023	128	UNSAT	12.1	78.3	-	-	-	-	-	-
2024 Nn4sys 2023	129	UNSAT	9.34	4.09	-	-	-	-	-	-
2024 Nn4sys 2023	130	UNSAT	9.63	38.0	-	-	-	-	-	-
2024 Nn4sys 2023	131	UNSAT	10.3	57.6	-	-	-	-	-	-
2024 Nn4sys 2023	132	UNSAT	10.5	74.5	-	-	-	-	-	-

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Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Nn4sys 2023	133	UNSAT	12.8	-	-	-	-	-	-	-
2024 Nn4sys 2023	134	UNSAT	13.6	-	-	-	-	-	-	-
2024 Nn4sys 2023	135	UNSAT	14.6	-	-	-	-	-	-	-
2024 Nn4sys 2023	136	UNSAT	15.4	-	-	-	-	-	-	-
2024 Nn4sys 2023	137	UNSAT	9.46	4.37	-	-	-	-	-	-
2024 Nn4sys 2023	138	UNSAT	10.5	-	-	-	-	-	-	-
2024 Nn4sys 2023	139	UNSAT	11.0	-	-	-	-	-	-	-
2024 Nn4sys 2023	140	UNSAT	10.9	-	-	-	-	-	-	-
2024 Nn4sys 2023	141	UNSAT	11.3	-	-	-	-	-	-	-
2024 Nn4sys 2023	142	UNSAT	11.4	-	-	-	-	-	-	-
2024 Nn4sys 2023	143	UNSAT	11.0	-	-	-	-	-	-	-
2024 Nn4sys 2023	144	UNSAT	11.3	-	-	-	-	-	-	-
2024 Nn4sys 2023	145	UNSAT	16.9	-	-	-	-	-	-	-
2024 Nn4sys 2023	146	UNSAT	17.4	-	-	-	-	-	-	-
2024 Nn4sys 2023	147	UNSAT	20.3	-	-	-	-	-	-	-
2024 Nn4sys 2023	148	UNSAT	22.4	-	-	-	-	-	-	-
2024 Nn4sys 2023	149	UNSAT	23.0	-	-	-	-	-	-	-
2024 Nn4sys 2023	150	UNSAT	26.0	-	-	-	-	-	-	-
2024 Nn4sys 2023	151	UNSAT	27.8	-	-	-	-	-	-	-
2024 Nn4sys 2023	152	UNSAT	29.1	-	-	-	-	-	-	-
2024 Nn4sys 2023	153	UNSAT	31.5	-	-	-	-	-	-	-
2024 Nn4sys 2023	154	UNSAT	32.9	-	-	-	-	-	-	-
2024 Nn4sys 2023	155	UNSAT	35.1	-	-	-	-	-	-	-
2024 Nn4sys 2023	156	UNSAT	38.1	-	-	-	-	-	-	-
2024 Nn4sys 2023	157	UNSAT	38.6	-	-	-	-	-	-	-
2024 Nn4sys 2023	158	UNSAT	41.5	-	-	-	-	-	-	-
2024 Nn4sys 2023	159	UNSAT	43.6	-	-	-	-	-	-	-
2024 Nn4sys 2023	160	UNSAT	10.8	15.3	-	-	-	-	-	-
2024 Nn4sys 2023	161	UNSAT	14.0	-	-	-	-	-	-	-
2024 Nn4sys 2023	162	UNSAT	16.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	163	UNSAT	18.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	164	UNSAT	28.4	-	-	-	-	-	-	-
2024 Nn4sys 2023	165	UNSAT	33.0	-	-	-	-	-	-	-
2024 Nn4sys 2023	166	UNSAT	38.1	-	-	-	-	-	-	-
2024 Nn4sys 2023	167	UNSAT	42.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	168	UNSAT	47.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	169	UNSAT	52.5	-	-	-	-	-	-	-
2024 Nn4sys 2023	170	UNSAT	56.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	171	UNSAT	12.1	13.9	-	-	-	-	-	-
2024 Nn4sys 2023	172	UNSAT	15.4	-	-	-	-	-	-	-
2024 Nn4sys 2023	173	UNSAT	16.8	-	-	-	-	-	-	-
2024 Nn4sys 2023	174	UNSAT	18.7	-	-	-	-	-	-	-
2024 Nn4sys 2023	175	UNSAT	20.3	-	-	-	-	-	-	-
2024 Nn4sys 2023	176	UNSAT	23.8	-	-	-	-	-	-	-
2024 Nn4sys 2023	177	UNSAT	24.8	-	-	-	-	-	-	-
2024 Nn4sys 2023	178	UNSAT	28.2	-	-	-	-	-	-	-
2024 Nn4sys 2023	179	UNSAT	50.3	-	-	-	-	-	-	-
2024 Nn4sys 2023	180	UNSAT	60.7	-	-	-	-	-	-	-
2024 Nn4sys 2023	181	UNSAT	72.8	-	-	-	-	-	-	-
2024 Nn4sys 2023	182	UNSAT	83.1	-	-	-	-	-	-	-
2024 Nn4sys 2023	183	UNSAT	94.9	-	-	-	-	-	-	-
2024 Nn4sys 2023	184	UNSAT	106	-	-	-	-	-	-	-
2024 Nn4sys 2023	185	UNSAT	118	-	-	-	-	-	-	-
2024 Nn4sys 2023	186	UNSAT	131	-	-	-	-	-	-	-
2024 Nn4sys 2023	187	UNSAT	140	-	-	-	-	-	-	-
2024 Nn4sys 2023	188	UNSAT	149	-	-	-	-	-	-	-
2024 Nn4sys 2023	189	UNSAT	161	-	-	-	-	-	-	-
2024 Nn4sys 2023	190	UNSAT	173	-	-	-	-	-	-	-
2024 Nn4sys 2023	191	UNSAT	182	-	-	-	-	-	-	-
2024 Nn4sys 2023	192	UNSAT	193	-	-	-	-	-	-	-
2024 Nn4sys 2023	193	UNSAT	206	-	-	-	-	-	-	-
2024 Safenlp	0	UNSAT	7.41	4.06	6.09	1.16	25.9	-	12.1	-
2024 Safenlp	1	UNSAT	7.81	3.70	3.10	1.34	-	1.53	-	-
2024 Safenlp	2	UNSAT	8.23	4.11	✗	1.36	-	-	-	-
2024 Safenlp	3	UNSAT	8.33	3.98	✗	1.28	-	1.53	-	-
2024 Safenlp	4	UNSAT	8.31	-	✗	3.06	-	-	11.5	-
2024 Safenlp	5	UNSAT	7.65	3.62	1.09	1.39	23.7	1.52	12.6	-
2024 Safenlp	6	UNSAT	8.44	4.07	6.09	1.53	-	-	12.5	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	7	UNSAT	8.24	3.61	X	1.36	-	1.53	-	-
2024 Safenlp	8	UNSAT	8.12	3.71	X	1.37	-	1.53	-	-
2024 Safenlp	9	UNSAT	8.29	3.71	3.10	1.40	-	1.52	-	-
2024 Safenlp	10	UNSAT	8.32	3.67	6.09	1.36	-	1.53	11.3	-
2024 Safenlp	11	UNSAT	8.33	3.70	X	1.33	-	-	-	-
2024 Safenlp	12	UNSAT	8.77	-	X	-	-	-	-	-
2024 Safenlp	13	UNSAT	8.47	5.20	6.09	1.97	-	-	12.0	-
2024 Safenlp	14	UNSAT	7.85	3.65	1.09	1.35	24.7	1.52	12.7	-
2024 Safenlp	15	UNSAT	8.23	-	3.10	2.16	-	-	-	-
2024 Safenlp	16	UNSAT	8.14	3.72	3.10	1.31	-	1.53	-	-
2024 Safenlp	17	UNSAT	7.59	3.60	1.09	1.33	24.5	-	12.0	-
2024 Safenlp	18	UNSAT	7.78	3.67	1.09	1.35	23.8	1.53	12.3	-
2024 Safenlp	19	UNSAT	7.13	3.73	6.09	1.13	25.9	1.55	13.2	-
2024 Safenlp	20	UNSAT	7.77	3.69	1.09	1.30	24.3	1.53	13.8	-
2024 Safenlp	21	UNSAT	8.59	6.35	6.09	2.35	-	-	-	-
2024 Safenlp	22	UNSAT	7.77	3.59	1.09	1.25	24.3	-	12.4	-
2024 Safenlp	23	UNSAT	7.83	3.71	1.09	1.38	23.8	-	12.4	-
2024 Safenlp	24	UNSAT	8.38	23.4	6.09	3.57	-	-	-	-
2024 Safenlp	25	UNSAT	8.34	3.72	X	1.34	-	1.53	-	-
2024 Safenlp	26	UNSAT	8.57	17.8	7.10	3.76	-	-	-	-
2024 Safenlp	27	UNSAT	8.18	3.71	X	1.36	-	1.53	-	-
2024 Safenlp	28	UNSAT	8.53	6.59	7.10	2.66	-	-	23.7	-
2024 Safenlp	29	UNSAT	7.91	3.64	1.09	1.42	-	1.52	12.4	-
2024 Safenlp	30	UNSAT	7.71	3.66	1.09	1.30	-	1.53	12.6	-
2024 Safenlp	31	UNSAT	8.13	-	X	-	-	-	-	-
2024 Safenlp	32	UNSAT	7.14	3.76	6.09	1.15	26.1	1.52	12.0	-
2024 Safenlp	33	UNSAT	8.52	-	7.10	5.10	-	-	-	-
2024 Safenlp	34	UNSAT	7.83	3.70	1.09	1.38	23.9	1.53	13.1	-
2024 Safenlp	35	UNSAT	8.32	4.02	X	2.02	-	-	-	-
2024 Safenlp	36	UNSAT	8.57	17.8	X	2.59	-	-	12.9	-
2024 Safenlp	37	UNSAT	8.34	3.71	X	1.34	-	-	-	-
2024 Safenlp	38	UNSAT	8.35	3.62	X	1.35	23.8	1.52	13.8	-
2024 Safenlp	39	UNSAT	8.32	3.69	X	1.36	-	1.53	-	-
2024 Safenlp	40	UNSAT	8.11	3.63	X	1.36	-	1.53	-	-
2024 Safenlp	41	UNSAT	7.11	3.75	X	1.19	26.5	1.52	12.1	-
2024 Safenlp	42	UNSAT	7.87	3.72	1.09	1.41	23.9	1.53	12.4	-
2024 Safenlp	43	UNSAT	7.79	3.61	1.09	1.18	24.0	-	12.8	-
2024 Safenlp	44	UNSAT	8.11	3.67	X	1.37	-	1.53	-	-
2024 Safenlp	45	UNSAT	8.32	3.69	X	1.40	-	1.53	-	-
2024 Safenlp	46	UNSAT	10.0	-	8.11	18.7	-	-	-	-
2024 Safenlp	47	UNSAT	7.12	3.79	6.09	1.21	26.1	1.52	12.7	-
2024 Safenlp	48	UNSAT	8.97	-	7.10	-	-	-	-	-
2024 Safenlp	49	UNSAT	8.59	11.4	6.09	2.29	-	-	11.6	-
2024 Safenlp	50	UNSAT	8.34	3.72	3.10	1.36	23.6	1.53	12.9	-
2024 Safenlp	51	UNSAT	7.89	3.65	1.09	1.46	24.1	1.52	12.9	-
2024 Safenlp	52	UNSAT	7.13	3.77	6.09	1.21	25.2	1.52	13.3	-
2024 Safenlp	53	UNSAT	8.32	3.70	X	1.40	23.8	1.53	13.0	-
2024 Safenlp	54	UNSAT	8.32	3.68	X	1.35	-	1.52	-	-
2024 Safenlp	55	UNSAT	8.33	3.68	X	1.41	-	-	-	-
2024 Safenlp	56	UNSAT	7.83	3.60	1.09	1.38	-	1.52	13.3	-
2024 Safenlp	57	UNSAT	8.32	3.69	3.10	1.41	-	1.53	14.0	-
2024 Safenlp	58	UNSAT	8.31	3.67	X	1.64	-	-	-	-
2024 Safenlp	59	UNSAT	8.51	5.58	6.09	1.84	-	-	12.2	-
2024 Safenlp	60	UNSAT	8.31	3.70	3.10	1.37	-	-	-	-
2024 Safenlp	61	UNSAT	8.36	4.53	6.09	1.38	-	-	12.2	-
2024 Safenlp	62	UNSAT	7.70	3.58	1.09	1.34	24.1	1.52	12.6	-
2024 Safenlp	63	UNSAT	7.82	3.58	1.09	1.39	23.9	-	12.8	-
2024 Safenlp	64	UNSAT	8.25	3.71	X	1.38	-	1.54	-	-
2024 Safenlp	65	UNSAT	8.36	3.70	1.09	1.39	-	1.53	-	-
2024 Safenlp	66	UNSAT	8.36	3.64	3.10	1.40	-	1.52	13.2	-
2024 Safenlp	67	UNSAT	7.84	3.63	1.09	1.44	24.0	1.53	12.7	-
2024 Safenlp	68	UNSAT	8.14	4.13	X	1.33	-	1.53	-	-
2024 Safenlp	69	UNSAT	7.53	3.63	X	1.16	23.9	1.73	12.0	-
2024 Safenlp	70	UNSAT	8.53	10.4	6.09	3.12	-	-	-	-
2024 Safenlp	71	UNSAT	8.32	-	X	1.89	-	-	-	-
2024 Safenlp	72	UNSAT	8.42	-	6.09	7.14	-	-	-	-
2024 Safenlp	73	UNSAT	8.09	4.13	X	1.72	-	1.52	-	-
2024 Safenlp	74	UNSAT	8.38	-	3.10	1.96	-	-	-	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	75	UNSAT	8.24	-	3.10	-	-	-	-	-
2024 Safenlp	76	UNSAT	7.94	3.68	X	1.32	-	-	-	-
2024 Safenlp	77	UNSAT	7.60	3.66	1.09	1.13	24.4	1.78	11.9	-
2024 Safenlp	78	UNSAT	8.97	-	X	-	-	-	-	-
2024 Safenlp	79	UNSAT	7.11	3.85	6.09	1.19	26.0	1.52	11.6	-
2024 Safenlp	80	UNSAT	7.38	3.87	6.09	1.23	26.4	1.52	12.9	-
2024 Safenlp	81	UNSAT	8.29	3.67	3.10	1.39	-	1.53	-	-
2024 Safenlp	82	UNSAT	7.83	3.65	1.09	1.35	24.9	1.53	13.0	-
2024 Safenlp	83	UNSAT	8.21	3.59	X	1.37	24.5	1.52	13.7	-
2024 Safenlp	84	UNSAT	8.20	3.70	X	1.35	-	1.53	-	-
2024 Safenlp	85	UNSAT	7.77	3.69	1.09	1.42	24.4	1.53	11.4	-
2024 Safenlp	86	UNSAT	8.90	-	7.10	-	-	-	-	-
2024 Safenlp	87	UNSAT	8.25	3.69	X	1.52	-	1.53	-	-
2024 Safenlp	88	UNSAT	8.30	-	3.10	1.63	-	-	-	-
2024 Safenlp	89	UNSAT	8.09	3.66	X	1.41	-	1.53	-	-
2024 Safenlp	90	UNSAT	7.11	3.74	6.09	1.17	25.6	1.52	11.0	-
2024 Safenlp	91	UNSAT	8.50	10.8	6.09	4.13	-	-	-	-
2024 Safenlp	92	UNSAT	8.37	-	X	1.37	-	-	-	-
2024 Safenlp	93	UNSAT	8.31	3.68	X	1.39	-	1.53	-	-
2024 Safenlp	94	UNSAT	7.81	3.68	1.09	1.37	-	1.52	12.3	-
2024 Safenlp	95	UNSAT	8.24	3.69	3.10	1.26	-	1.53	13.4	-
2024 Safenlp	96	UNSAT	7.64	3.61	1.09	1.29	24.2	1.52	13.3	-
2024 Safenlp	97	UNSAT	8.93	-	8.10	-	-	-	-	-
2024 Safenlp	98	UNSAT	8.50	-	X	3.31	-	-	15.6	-
2024 Safenlp	99	UNSAT	8.20	3.61	X	1.33	24.0	1.53	12.9	-
2024 Safenlp	100	UNSAT	7.64	3.59	X	1.19	25.0	1.77	13.2	-
2024 Safenlp	101	UNSAT	8.09	3.66	X	1.36	-	1.52	-	-
2024 Safenlp	102	UNSAT	8.27	3.67	X	1.30	-	1.52	-	-
2024 Safenlp	103	UNSAT	8.38	9.00	6.09	2.62	-	-	29.7	-
2024 Safenlp	104	UNSAT	7.83	3.62	1.09	1.25	23.9	1.53	12.2	-
2024 Safenlp	105	UNSAT	8.40	7.98	6.09	2.27	-	-	11.8	-
2024 Safenlp	106	UNSAT	7.65	3.63	1.09	1.24	24.1	1.53	13.3	-
2024 Safenlp	107	UNSAT	7.11	3.80	X	1.10	26.1	1.52	13.1	-
2024 Safenlp	108	UNSAT	8.38	12.1	6.09	2.91	-	-	12.4	-
2024 Safenlp	109	UNSAT	7.12	3.79	X	1.15	26.5	1.52	13.5	-
2024 Safenlp	110	UNSAT	10.8	-	30.3	-	-	-	-	-
2024 Safenlp	111	UNSAT	7.86	3.67	1.09	1.42	-	1.52	12.3	-
2024 Safenlp	112	UNSAT	7.14	3.78	6.09	1.18	26.1	1.56	11.8	-
2024 Safenlp	113	UNSAT	8.31	-	3.10	-	-	-	-	-
2024 Safenlp	114	UNSAT	8.35	14.9	7.10	2.39	-	-	13.2	-
2024 Safenlp	115	UNSAT	7.83	3.66	1.09	1.41	24.2	1.53	13.1	-
2024 Safenlp	116	UNSAT	8.20	3.70	X	1.25	-	1.52	-	-
2024 Safenlp	117	UNSAT	8.27	3.64	X	1.30	-	-	13.6	-
2024 Safenlp	118	UNSAT	8.35	4.04	7.10	1.34	-	-	13.6	-
2024 Safenlp	119	UNSAT	8.44	14.1	7.10	4.53	-	-	-	-
2024 Safenlp	120	UNSAT	11.2	-	12.1	-	-	-	-	-
2024 Safenlp	121	UNSAT	7.75	3.66	1.09	1.38	-	1.53	13.4	-
2024 Safenlp	122	UNSAT	8.42	14.3	6.09	2.75	-	-	-	-
2024 Safenlp	123	UNSAT	7.83	3.62	1.09	1.38	-	-	11.1	-
2024 Safenlp	124	UNSAT	8.33	4.06	3.10	1.41	-	-	-	-
2024 Safenlp	125	UNSAT	10.6	-	8.11	-	-	-	-	-
2024 Safenlp	126	UNSAT	8.34	-	3.10	1.67	-	-	-	-
2024 Safenlp	127	UNSAT	8.15	3.66	3.10	1.40	-	1.53	-	-
2024 Safenlp	128	UNSAT	7.82	3.57	1.09	1.23	24.1	-	12.3	-
2024 Safenlp	129	UNSAT	8.28	3.61	3.10	1.40	-	1.53	-	-
2024 Safenlp	130	UNSAT	7.68	3.62	1.09	1.35	23.9	-	12.8	-
2024 Safenlp	131	UNSAT	7.71	3.61	X	1.40	24.4	1.52	13.1	-
2024 Safenlp	132	UNSAT	12.3	-	27.3	-	-	-	-	-
2024 Safenlp	133	UNSAT	7.11	3.83	6.09	1.12	25.7	1.58	12.8	-
2024 Safenlp	134	UNSAT	8.35	3.68	3.10	1.30	-	1.53	-	-
2024 Safenlp	135	UNSAT	8.96	-	7.10	18.8	-	-	-	-
2024 Safenlp	136	UNSAT	8.31	-	X	1.70	-	-	-	-
2024 Safenlp	137	UNSAT	8.37	3.67	3.10	1.41	-	1.53	-	-
2024 Safenlp	138	UNSAT	7.84	3.65	1.09	1.39	23.6	-	11.3	-
2024 Safenlp	139	UNSAT	8.32	3.66	X	1.33	-	1.53	-	-
2024 Safenlp	140	UNSAT	7.74	3.67	1.09	1.36	24.1	-	13.1	-
2024 Safenlp	141	UNSAT	8.19	3.72	X	1.43	-	1.53	-	-
2024 Safenlp	142	UNSAT	7.12	3.78	X	1.21	26.4	1.52	10.8	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	143	UNSAT	8.47	-	6.09	11.9	-	-	-	-
2024 Safenlp	144	UNSAT	8.25	-	3.10	-	-	-	-	-
2024 Safenlp	145	UNSAT	7.13	3.80	7.10	1.14	25.9	1.52	11.1	-
2024 Safenlp	146	UNSAT	10.3	-	9.11	-	-	-	-	-
2024 Safenlp	147	UNSAT	13.5	-	-	-	-	-	-	-
2024 Safenlp	148	UNSAT	7.13	3.84	X	1.15	25.8	1.52	11.0	-
2024 Safenlp	149	UNSAT	7.90	3.75	1.09	1.32	23.8	1.53	13.3	-
2024 Safenlp	150	UNSAT	7.18	3.80	6.09	1.08	26.9	1.52	13.8	-
2024 Safenlp	151	UNSAT	8.34	3.71	X	1.24	-	1.52	-	-
2024 Safenlp	152	UNSAT	8.59	-	X	-	-	-	-	-
2024 Safenlp	153	UNSAT	8.60	13.3	6.09	2.83	-	-	13.1	-
2024 Safenlp	154	UNSAT	7.15	3.79	X	1.19	25.6	1.52	13.9	-
2024 Safenlp	155	UNSAT	8.32	3.72	3.10	1.36	-	1.52	-	-
2024 Safenlp	156	UNSAT	7.83	3.58	1.09	1.41	24.2	1.53	12.3	-
2024 Safenlp	157	UNSAT	8.34	3.71	X	1.30	-	1.53	-	-
2024 Safenlp	158	UNSAT	8.40	-	6.09	5.67	-	-	14.2	-
2024 Safenlp	159	UNSAT	8.17	-	3.10	1.25	-	1.53	-	-
2024 Safenlp	160	UNSAT	7.84	3.61	1.09	1.25	24.4	1.53	12.2	-
2024 Safenlp	161	UNSAT	8.25	-	X	1.30	-	-	-	-
2024 Safenlp	162	UNSAT	7.13	3.74	X	1.14	25.6	1.53	11.1	-
2024 Safenlp	163	UNSAT	8.30	3.70	3.10	1.36	-	1.53	-	-
2024 Safenlp	164	UNSAT	8.35	3.71	3.10	1.37	-	1.52	-	-
2024 Safenlp	165	UNSAT	7.88	3.68	1.09	1.33	23.6	1.54	13.0	-
2024 Safenlp	166	UNSAT	7.84	3.63	1.09	1.33	24.0	-	13.6	-
2024 Safenlp	167	UNSAT	8.35	-	X	-	-	-	-	-
2024 Safenlp	168	UNSAT	8.38	-	3.10	-	-	-	-	-
2024 Safenlp	169	UNSAT	7.83	3.63	1.09	X	-	1.53	12.2	-
2024 Safenlp	170	UNSAT	10.2	-	9.11	-	-	-	-	-
2024 Safenlp	171	UNSAT	8.19	3.75	3.10	1.41	-	-	-	-
2024 Safenlp	172	UNSAT	8.29	5.72	X	1.65	-	-	12.2	-
2024 Safenlp	173	UNSAT	9.03	-	7.10	-	-	-	-	-
2024 Safenlp	174	UNSAT	7.84	3.71	X	1.28	-	1.53	12.2	-
2024 Safenlp	175	UNSAT	8.19	3.63	3.10	1.32	-	1.53	-	-
2024 Safenlp	176	UNSAT	7.85	3.67	1.09	1.28	24.7	1.53	12.0	-
2024 Safenlp	177	UNSAT	8.42	-	X	1.84	-	-	-	-
2024 Safenlp	178	UNSAT	8.10	3.69	X	1.33	-	1.53	12.0	-
2024 Safenlp	179	UNSAT	8.54	8.23	X	2.03	-	-	13.3	-
2024 Safenlp	180	UNSAT	7.18	3.82	X	1.15	25.6	1.52	13.6	-
2024 Safenlp	181	UNSAT	8.63	-	X	-	-	-	-	-
2024 Safenlp	182	UNSAT	8.36	-	X	2.01	-	-	-	-
2024 Safenlp	183	UNSAT	8.32	3.68	X	1.43	-	1.53	-	-
2024 Safenlp	184	UNSAT	7.59	3.66	6.09	1.31	24.3	1.53	12.2	-
2024 Safenlp	185	UNSAT	8.72	21.2	7.10	3.36	-	-	-	-
2024 Safenlp	186	UNSAT	8.21	3.65	3.10	1.37	-	1.53	-	-
2024 Safenlp	187	UNSAT	7.66	3.66	3.10	1.34	-	1.53	12.5	-
2024 Safenlp	188	UNSAT	8.19	3.71	X	1.28	-	1.52	-	-
2024 Safenlp	189	UNSAT	8.35	3.68	X	1.32	-	1.53	11.0	-
2024 Safenlp	190	UNSAT	7.84	3.67	1.09	1.35	23.9	-	13.7	-
2024 Safenlp	191	UNSAT	7.57	3.63	1.09	1.23	23.9	-	13.8	-
2024 Safenlp	192	UNSAT	8.26	5.47	7.10	1.33	-	-	14.0	-
2024 Safenlp	193	UNSAT	7.16	3.75	6.09	1.11	26.3	1.54	14.1	-
2024 Safenlp	194	UNSAT	8.31	3.70	X	1.25	-	-	-	-
2024 Safenlp	195	UNSAT	7.16	3.79	X	1.09	26.5	1.56	11.0	-
2024 Safenlp	196	UNSAT	9.15	-	7.10	18.0	-	-	-	-
2024 Safenlp	197	UNSAT	7.69	3.67	X	1.36	23.8	1.53	12.1	-
2024 Safenlp	198	UNSAT	8.32	-	6.09	2.29	-	-	14.1	-
2024 Safenlp	199	UNSAT	7.88	3.63	1.09	1.25	24.5	1.53	14.2	-
2024 Safenlp	200	UNSAT	8.36	3.74	X	1.25	-	1.53	-	-
2024 Safenlp	201	UNSAT	7.15	3.81	6.09	1.08	25.5	1.57	11.9	-
2024 Safenlp	202	UNSAT	7.13	3.72	6.09	1.08	26.1	1.52	13.8	-
2024 Safenlp	203	UNSAT	8.09	3.67	3.10	1.32	-	1.53	-	-
2024 Safenlp	204	UNSAT	8.35	3.69	X	1.25	-	1.53	-	-
2024 Safenlp	205	UNSAT	8.21	3.71	3.10	1.24	-	1.53	12.5	-
2024 Safenlp	206	UNSAT	8.30	3.73	X	1.45	-	-	-	-
2024 Safenlp	207	UNSAT	8.14	3.71	X	1.34	-	1.53	-	-
2024 Safenlp	208	UNSAT	8.39	3.66	1.09	1.26	-	1.53	13.7	-
2024 Safenlp	209	UNSAT	7.18	3.80	6.09	1.05	25.3	1.51	14.1	-
2024 Safenlp	210	UNSAT	10.2	-	9.11	-	-	-	-	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	211	UNSAT	8.36	3.65	3.10	1.37	-	1.52	-	-
2024 Safenlp	212	UNSAT	7.15	3.79	6.09	1.18	26.3	1.52	12.3	-
2024 Safenlp	213	UNSAT	7.91	3.72	3.10	1.29	24.0	1.53	13.9	-
2024 Safenlp	214	UNSAT	7.15	3.79	X	1.13	25.9	1.53	13.7	-
2024 Safenlp	215	UNSAT	7.14	3.74	6.09	1.16	25.6	1.58	13.7	-
2024 Safenlp	216	UNSAT	8.44	13.2	X	2.56	-	-	13.7	-
2024 Safenlp	217	UNSAT	7.83	3.62	1.09	1.26	24.2	1.52	14.2	-
2024 Safenlp	218	UNSAT	7.75	3.61	1.09	1.28	-	1.53	14.1	-
2024 Safenlp	219	UNSAT	8.32	3.64	3.10	1.42	-	-	-	-
2024 Safenlp	220	UNSAT	7.87	3.61	1.09	1.39	-	1.53	13.1	-
2024 Safenlp	221	UNSAT	8.34	3.68	X	1.36	-	1.53	-	-
2024 Safenlp	222	UNSAT	8.42	3.70	X	1.46	-	-	-	-
2024 Safenlp	223	UNSAT	7.15	3.76	6.09	1.21	26.6	1.52	11.1	-
2024 Safenlp	224	UNSAT	8.24	3.71	X	1.40	-	-	-	-
2024 Safenlp	225	UNSAT	7.74	3.65	1.09	1.32	23.5	1.53	12.2	-
2024 Safenlp	226	UNSAT	7.13	3.79	6.09	1.16	26.1	1.55	14.4	-
2024 Safenlp	227	UNSAT	8.30	3.75	3.10	1.41	-	1.53	-	-
2024 Safenlp	228	UNSAT	10.1	-	7.10	-	-	-	-	-
2024 Safenlp	229	UNSAT	7.14	3.79	6.09	1.24	26.5	1.51	11.9	-
2024 Safenlp	230	UNSAT	7.11	3.79	6.09	1.14	25.6	1.56	14.0	-
2024 Safenlp	231	UNSAT	8.16	3.60	3.10	1.28	-	1.53	-	-
2024 Safenlp	232	UNSAT	7.73	3.60	1.09	1.35	24.7	-	12.5	-
2024 Safenlp	233	UNSAT	7.80	3.65	1.09	1.45	24.3	1.53	13.0	-
2024 Safenlp	234	UNSAT	8.69	15.8	6.09	4.23	-	-	-	-
2024 Safenlp	235	UNSAT	8.33	4.29	X	1.41	-	-	12.9	-
2024 Safenlp	236	UNSAT	8.17	-	X	1.51	-	-	-	-
2024 Safenlp	237	UNSAT	7.80	3.61	1.09	1.35	-	1.53	-	-
2024 Safenlp	238	UNSAT	8.09	3.69	3.10	1.37	-	1.53	-	-
2024 Safenlp	239	UNSAT	8.45	21.5	7.10	6.32	-	-	-	-
2024 Safenlp	240	UNSAT	8.59	-	X	-	-	-	-	-
2024 Safenlp	241	UNSAT	7.11	3.77	X	1.08	26.6	1.53	11.1	-
2024 Safenlp	242	UNSAT	8.15	3.68	6.09	1.24	-	1.53	14.4	-
2024 Safenlp	243	UNSAT	8.18	4.20	X	1.39	-	1.52	-	-
2024 Safenlp	244	UNSAT	8.94	-	7.10	-	-	-	-	-
2024 Safenlp	245	UNSAT	8.53	5.71	6.09	1.81	-	-	11.1	-
2024 Safenlp	246	UNSAT	7.13	3.80	6.09	1.17	26.7	1.58	14.0	-
2024 Safenlp	247	UNSAT	8.25	7.54	6.09	2.01	-	-	14.3	-
2024 Safenlp	248	UNSAT	8.23	3.65	X	1.33	-	-	-	-
2024 Safenlp	249	UNSAT	8.26	3.69	X	1.39	-	1.53	12.6	-
2024 Safenlp	250	UNSAT	8.48	5.08	6.09	1.41	-	-	14.5	-
2024 Safenlp	251	UNSAT	7.83	3.64	X	1.34	24.2	1.53	14.7	-
2024 Safenlp	252	UNSAT	9.88	-	18.2	-	-	-	-	-
2024 Safenlp	253	UNSAT	7.83	3.62	1.09	1.36	-	-	12.4	-
2024 Safenlp	254	UNSAT	8.22	3.63	3.10	1.43	-	1.53	-	-
2024 Safenlp	255	UNSAT	8.18	3.72	X	1.61	-	-	-	-
2024 Safenlp	256	UNSAT	7.12	3.72	X	1.15	26.2	1.52	12.0	-
2024 Safenlp	257	UNSAT	8.39	4.04	6.09	1.70	-	-	14.0	-
2024 Safenlp	258	UNSAT	7.74	3.58	1.09	1.33	24.4	-	14.4	-
2024 Safenlp	259	UNSAT	8.26	3.67	X	1.33	-	-	-	-
2024 Safenlp	260	UNSAT	8.42	4.77	6.09	2.15	-	-	12.3	-
2024 Safenlp	261	UNSAT	7.14	3.79	X	1.21	25.6	1.54	14.0	-
2024 Safenlp	262	UNSAT	7.89	3.59	1.09	1.35	24.1	1.53	14.2	-
2024 Safenlp	263	UNSAT	10.8	-	53.5	-	-	-	-	-
2024 Safenlp	264	UNSAT	7.74	3.63	X	1.37	24.7	1.52	12.1	-
2024 Safenlp	265	UNSAT	7.15	3.75	X	1.11	26.4	1.59	12.9	-
2024 Safenlp	266	UNSAT	9.28	-	7.10	-	-	-	-	-
2024 Safenlp	267	UNSAT	8.08	3.64	3.10	1.32	-	1.53	-	-
2024 Safenlp	268	UNSAT	8.35	3.64	3.10	1.38	-	1.52	-	-
2024 Safenlp	269	UNSAT	7.83	3.60	1.09	1.27	-	1.53	12.0	-
2024 Safenlp	270	UNSAT	8.29	3.67	3.10	1.39	-	1.53	-	-
2024 Safenlp	271	UNSAT	10.3	-	10.1	-	-	-	-	-
2024 Safenlp	272	UNSAT	7.81	3.61	1.09	1.40	24.0	1.53	12.0	-
2024 Safenlp	273	UNSAT	7.14	3.77	X	1.13	25.6	1.52	14.2	-
2024 Safenlp	274	UNSAT	8.23	-	3.10	1.33	-	1.52	-	-
2024 Safenlp	275	UNSAT	8.20	3.61	1.09	1.43	23.9	1.53	12.3	-
2024 Safenlp	276	UNSAT	7.58	3.68	1.09	1.35	24.6	1.53	14.5	-
2024 Safenlp	277	UNSAT	9.08	-	X	-	-	-	-	-
2024 Safenlp	278	UNSAT	7.83	3.62	1.09	1.38	-	1.53	-	-



Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$	$\beta$	C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	279	UNSAT	8.24	3.71		X	1.28	-	1.52	-	-	-
2024 Safenlp	280	UNSAT	8.20	3.72		3.10	1.32	-	-	-	-	-
2024 Safenlp	281	UNSAT	10.1	-		13.1	-	-	-	-	-	-
2024 Safenlp	282	UNSAT	8.34	4.06		3.10	1.32	-	-	-	-	-
2024 Safenlp	283	UNSAT	8.12	3.67		X	1.27	-	1.53	-	-	-
2024 Safenlp	284	UNSAT	7.83	3.58		1.09	1.35	-	1.53	13.3	-	-
2024 Safenlp	285	UNSAT	7.81	3.66		1.09	1.32	24.6	1.53	14.9	-	-
2024 Safenlp	286	UNSAT	7.13	3.74		6.09	1.11	25.8	1.52	14.0	-	-
2024 Safenlp	287	UNSAT	8.33	3.67		X	1.38	-	1.53	-	-	-
2024 Safenlp	288	UNSAT	7.80	3.68		1.09	1.39	23.9	1.52	12.1	-	-
2024 Safenlp	289	UNSAT	7.12	3.84		X	1.15	25.9	1.52	15.2	-	-
2024 Safenlp	290	UNSAT	8.15	3.74		X	1.30	-	1.53	-	-	-
2024 Safenlp	291	UNSAT	8.35	3.69		3.10	1.32	-	-	-	-	-
2024 Safenlp	292	UNSAT	16.7	-		22.2	-	-	-	-	-	-
2024 Safenlp	293	UNSAT	8.32	3.67		X	1.38	-	-	12.7	-	-
2024 Safenlp	294	UNSAT	8.32	6.57		6.09	1.89	-	-	14.4	-	-
2024 Safenlp	295	UNSAT	7.70	3.58		3.10	1.45	-	1.53	14.9	-	-
2024 Safenlp	296	UNSAT	8.34	4.35		X	1.36	-	-	-	-	-
2024 Safenlp	297	UNSAT	8.32	4.74		X	1.62	-	-	13.1	-	-
2024 Safenlp	298	UNSAT	8.29	3.63		X	1.31	-	1.52	-	-	-
2024 Safenlp	299	UNSAT	7.83	3.64		1.09	1.37	-	-	12.6	-	-
2024 Safenlp	300	UNSAT	7.80	3.64		1.09	1.40	-	1.52	14.9	-	-
2024 Safenlp	301	UNSAT	7.78	3.59		1.09	1.36	-	1.53	14.9	-	-
2024 Safenlp	302	UNSAT	7.85	3.63		1.09	1.32	-	1.53	14.0	-	-
2024 Safenlp	303	UNSAT	7.63	3.66		X	1.40	24.4	1.53	14.1	-	-
2024 Safenlp	304	UNSAT	8.16	3.68		X	1.38	-	1.53	14.7	-	-
2024 Safenlp	305	UNSAT	9.01	-		7.10	-	-	-	-	-	-
2024 Safenlp	306	UNSAT	7.12	3.79		6.09	1.07	25.9	1.53	12.7	-	-
2024 Safenlp	307	UNSAT	8.15	-		3.10	1.80	-	-	-	-	-
2024 Safenlp	308	UNSAT	8.33	3.70		1.09	1.31	-	-	12.6	-	-
2024 Safenlp	309	UNSAT	7.71	3.65		1.09	1.37	23.6	-	14.7	-	-
2024 Safenlp	310	UNSAT	7.16	3.80		6.09	1.16	26.2	1.57	15.2	-	-
2024 Safenlp	311	UNSAT	8.30	-		X	1.62	-	-	-	-	-
2024 Safenlp	312	UNSAT	8.42	8.61		X	2.01	-	-	11.6	-	-
2024 Safenlp	313	UNSAT	7.86	3.63		1.09	1.29	24.5	1.53	15.1	-	-
2024 Safenlp	314	UNSAT	7.56	3.68		1.09	1.28	24.7	1.53	14.6	-	-
2024 Safenlp	315	UNSAT	8.32	3.71		X	1.39	-	1.53	-	-	-
2024 Safenlp	316	UNSAT	8.01	3.63		1.09	1.35	-	1.53	12.3	-	-
2024 Safenlp	317	UNSAT	7.59	3.70		X	1.36	-	1.52	14.9	-	-
2024 Safenlp	318	UNSAT	8.23	3.70		X	1.39	-	1.53	-	-	-
2024 Safenlp	319	UNSAT	8.62	-		X	10.4	-	-	16.7	-	-
2024 Safenlp	320	UNSAT	8.34	6.35		X	1.41	-	-	-	-	-
2024 Safenlp	321	UNSAT	8.16	-		X	1.39	-	-	-	-	-
2024 Safenlp	322	UNSAT	8.08	3.70		3.10	1.34	-	1.52	-	-	-
2024 Safenlp	323	UNSAT	8.30	3.68		3.10	1.33	-	1.53	-	-	-
2024 Safenlp	324	UNSAT	8.37	3.69		X	1.28	-	-	-	-	-
2024 Safenlp	325	UNSAT	7.14	3.79		6.09	1.08	25.2	1.59	12.7	-	-
2024 Safenlp	326	UNSAT	7.14	3.76		6.10	1.08	25.6	1.51	15.0	-	-
2024 Safenlp	327	UNSAT	8.13	3.72		3.10	1.26	-	1.52	-	-	-
2024 Safenlp	328	UNSAT	8.41	3.70		X	1.40	-	-	-	-	-
2024 Safenlp	329	UNSAT	8.39	-		3.10	2.01	-	-	-	-	-
2024 Safenlp	330	UNSAT	8.34	11.9		X	2.39	-	-	12.8	-	-
2024 Safenlp	331	UNSAT	8.47	-		X	4.44	-	-	15.5	-	-
2024 Safenlp	332	UNSAT	8.24	3.65		3.10	1.35	-	1.53	-	-	-
2024 Safenlp	333	UNSAT	8.10	3.71		3.10	1.61	-	-	-	-	-
2024 Safenlp	334	UNSAT	8.32	3.69		3.10	1.39	-	1.52	14.4	-	-
2024 Safenlp	335	UNSAT	7.14	3.80		6.09	1.16	25.9	1.52	15.1	-	-
2024 Safenlp	336	UNSAT	12.0	-		76.6	-	-	-	-	-	-
2024 Safenlp	337	UNSAT	10.2	-		8.11	-	-	-	-	-	-
2024 Safenlp	338	UNSAT	8.56	-		7.10	10.7	-	-	-	-	-
2024 Safenlp	339	UNSAT	7.14	3.79		6.09	1.16	26.2	1.52	12.1	-	-
2024 Safenlp	340	UNSAT	8.33	3.63		X	1.38	-	1.53	-	-	-
2024 Safenlp	341	UNSAT	8.25	3.68		X	1.40	-	1.53	-	-	-
2024 Safenlp	342	UNSAT	7.65	3.64		1.09	1.35	-	1.52	12.4	-	-
2024 Safenlp	343	UNSAT	7.86	3.60		1.09	1.31	-	1.52	14.9	-	-
2024 Safenlp	344	UNSAT	8.00	3.71		X	1.39	-	1.53	-	-	-
2024 Safenlp	345	UNSAT	8.30	3.66		3.10	1.38	-	-	-	-	-
2024 Safenlp	346	UNSAT	8.30	-		X	1.46	-	1.53	-	-	-



Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	347	UNSAT	8.26	-	X	1.34	-	-	-	-
2024 Safenlp	348	UNSAT	7.81	3.68	1.09	1.19	23.9	-	12.5	-
2024 Safenlp	349	UNSAT	8.17	3.69	3.10	1.37	-	1.53	-	-
2024 Safenlp	350	UNSAT	7.84	3.65	1.09	1.30	24.6	1.53	12.6	-
2024 Safenlp	351	UNSAT	8.07	3.63	2.10	1.32	-	-	-	-
2024 Safenlp	352	UNSAT	8.32	3.75	3.10	1.35	-	1.53	-	-
2024 Safenlp	353	UNSAT	7.70	3.65	1.09	1.25	-	1.52	12.9	-
2024 Safenlp	354	UNSAT	8.31	-	X	-	-	-	-	-
2024 Safenlp	355	UNSAT	8.40	3.67	X	1.41	-	1.53	-	-
2024 Safenlp	356	UNSAT	8.21	3.65	X	1.36	-	-	-	-
2024 Safenlp	357	UNSAT	8.34	15.7	X	2.45	-	-	12.7	-
2024 Safenlp	358	UNSAT	8.30	3.68	3.10	1.35	-	1.52	-	-
2024 Safenlp	359	UNSAT	7.81	3.64	1.09	1.34	-	1.53	11.5	-
2024 Safenlp	360	UNSAT	8.42	10.00	6.09	2.68	-	-	-	-
2024 Safenlp	361	UNSAT	8.19	3.69	1.09	1.34	24.4	1.53	12.6	-
2024 Safenlp	362	UNSAT	8.09	-	3.10	-	-	-	-	-
2024 Safenlp	363	UNSAT	8.44	-	X	-	-	-	-	-
2024 Safenlp	364	UNSAT	8.31	4.90	6.09	1.80	-	-	12.7	-
2024 Safenlp	365	UNSAT	8.26	22.2	X	2.86	-	-	14.7	-
2024 Safenlp	366	UNSAT	7.85	3.68	1.09	1.40	24.1	1.53	15.7	-
2024 Safenlp	367	UNSAT	7.82	3.57	1.09	1.35	24.3	-	15.0	-
2024 Safenlp	368	UNSAT	8.65	-	X	-	-	-	-	-
2024 Safenlp	369	UNSAT	8.29	4.03	X	1.36	-	1.54	-	-
2024 Safenlp	370	UNSAT	8.44	-	17.2	-	-	-	-	-
2024 Safenlp	371	UNSAT	7.84	3.70	2.10	1.29	-	1.53	12.9	-
2024 Safenlp	372	UNSAT	8.14	3.66	X	1.36	-	1.53	-	-
2024 Safenlp	373	UNSAT	8.26	6.58	6.09	2.07	-	-	12.9	-
2024 Safenlp	374	UNSAT	8.52	-	7.10	3.33	-	-	21.9	-
2024 Safenlp	375	UNSAT	8.35	3.69	X	1.36	-	-	-	-
2024 Safenlp	376	UNSAT	7.14	3.77	9.12	1.19	26.8	1.53	12.8	-
2024 Safenlp	377	UNSAT	8.22	3.63	2.10	1.39	-	-	-	-
2024 Safenlp	378	UNSAT	7.16	3.85	X	1.16	26.3	1.52	13.2	-
2024 Safenlp	379	UNSAT	7.14	3.80	X	1.15	25.8	1.53	15.5	-
2024 Safenlp	380	UNSAT	17.2	-	24.2	-	-	-	-	-
2024 Safenlp	381	UNSAT	7.87	3.71	X	1.46	-	1.52	-	-
2024 Safenlp	382	UNSAT	8.26	-	X	2.34	-	-	-	-
2024 Safenlp	383	UNSAT	8.29	-	X	9.69	-	-	16.8	-
2024 Safenlp	384	UNSAT	7.57	3.61	1.09	1.23	23.8	-	14.7	-
2024 Safenlp	385	UNSAT	8.18	3.61	X	1.25	-	-	-	-
2024 Safenlp	386	UNSAT	7.12	3.82	X	1.08	25.4	1.59	12.7	-
2024 Safenlp	387	UNSAT	8.32	3.71	X	1.36	24.0	1.54	15.4	-
2024 Safenlp	388	UNSAT	8.40	18.0	X	2.96	-	-	15.2	-
2024 Safenlp	389	UNSAT	8.32	-	X	2.19	-	-	-	-
2024 Safenlp	390	UNSAT	7.12	3.83	6.09	1.15	26.6	1.52	13.3	-
2024 Safenlp	391	UNSAT	8.19	3.69	X	1.36	-	1.53	-	-
2024 Safenlp	392	UNSAT	7.85	3.68	1.09	1.42	-	1.53	12.9	-
2024 Safenlp	393	UNSAT	8.39	3.72	3.10	1.40	-	1.53	15.6	-
2024 Safenlp	394	UNSAT	8.27	3.73	X	1.33	-	1.53	-	-
2024 Safenlp	395	UNSAT	7.12	3.77	6.09	1.16	26.6	1.52	12.4	-
2024 Safenlp	396	UNSAT	7.82	3.66	2.09	1.41	25.6	1.53	14.6	-
2024 Safenlp	397	UNSAT	7.12	3.82	6.09	1.20	26.1	1.52	14.2	-
2024 Safenlp	398	UNSAT	8.31	-	3.10	1.63	-	-	-	-
2024 Safenlp	399	UNSAT	7.98	3.67	3.10	1.44	-	1.53	-	-
2024 Safenlp	400	UNSAT	7.14	3.80	X	1.16	26.8	1.52	13.1	-
2024 Safenlp	401	UNSAT	8.85	-	7.10	8.03	-	-	-	-
2024 Safenlp	402	UNSAT	7.14	3.78	6.09	1.21	26.2	1.52	13.3	-
2024 Safenlp	403	UNSAT	7.42	3.80	8.11	1.22	26.6	-	15.8	-
2024 Safenlp	404	UNSAT	8.24	3.66	X	1.36	-	1.53	-	-
2024 Safenlp	405	UNSAT	7.74	3.58	1.09	1.39	24.7	1.53	13.4	-
2024 Safenlp	406	UNSAT	8.19	3.56	X	1.48	-	1.53	-	-
2024 Safenlp	407	UNSAT	8.86	-	8.11	-	-	-	-	-
2024 Safenlp	408	UNSAT	8.32	-	X	1.93	-	-	-	-
2024 Safenlp	409	UNSAT	7.62	3.62	1.09	1.36	-	1.52	13.2	-
2024 Safenlp	410	UNSAT	7.59	3.59	1.09	1.32	24.0	1.53	16.2	-
2024 Safenlp	411	UNSAT	8.24	3.63	3.10	1.32	-	1.54	-	-
2024 Safenlp	412	UNSAT	8.26	4.02	6.09	1.39	-	-	13.2	-
2024 Safenlp	413	UNSAT	11.2	-	71.6	-	-	-	-	-
2024 Safenlp	414	UNSAT	7.84	3.61	1.09	1.33	24.3	1.52	12.8	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	415	UNSAT	7.13	3.76	6.09	1.15	26.8	1.53	15.7	-
2024 Safenlp	416	UNSAT	8.37	12.5	6.09	2.81	-	-	-	-
2024 Safenlp	417	UNSAT	8.33	3.69	3.10	1.31	-	1.53	-	-
2024 Safenlp	418	UNSAT	7.69	3.65	1.09	1.24	24.7	-	12.8	-
2024 Safenlp	419	UNSAT	8.55	-	X	2.62	-	-	16.0	-
2024 Safenlp	420	UNSAT	10.2	-	10.1	-	-	-	-	-
2024 Safenlp	421	UNSAT	8.32	-	X	-	-	-	-	-
2024 Safenlp	422	UNSAT	8.33	3.60	X	1.40	-	1.53	-	-
2024 Safenlp	423	UNSAT	8.32	3.70	8.11	1.37	-	1.53	-	-
2024 Safenlp	424	UNSAT	8.34	3.70	X	1.25	-	1.53	-	-
2024 Safenlp	425	UNSAT	8.31	4.18	X	1.37	-	-	-	-
2024 Safenlp	426	UNSAT	9.77	-	8.11	-	-	-	-	-
2024 Safenlp	427	UNSAT	7.76	3.65	1.09	1.26	24.7	-	13.4	-
2024 Safenlp	428	UNSAT	8.34	-	3.10	1.50	-	-	-	-
2024 Safenlp	429	UNSAT	8.80	-	7.10	16.9	-	-	-	-
2024 Safenlp	430	UNSAT	7.74	3.59	2.10	1.24	-	1.53	13.3	-
2024 Safenlp	431	UNSAT	8.25	3.69	X	1.26	-	-	-	-
2024 Safenlp	432	UNSAT	7.13	3.77	X	1.09	25.8	1.59	13.6	-
2024 Safenlp	433	UNSAT	8.12	-	3.10	1.93	-	-	-	-
2024 Safenlp	434	UNSAT	8.02	3.63	3.10	1.32	-	1.53	-	-
2024 Safenlp	435	UNSAT	8.22	3.65	X	1.29	-	1.53	-	-
2024 Safenlp	436	UNSAT	7.55	3.60	8.11	1.15	23.9	-	13.6	-
2024 Safenlp	437	UNSAT	8.87	-	X	-	-	-	-	-
2024 Safenlp	438	UNSAT	7.96	3.64	3.10	1.28	-	1.52	-	-
2024 Safenlp	439	UNSAT	8.23	3.60	X	1.33	-	1.53	-	-
2024 Safenlp	440	UNSAT	8.19	3.64	X	1.27	-	1.53	13.6	-
2024 Safenlp	441	UNSAT	7.80	3.65	1.09	1.27	24.6	1.53	15.7	-
2024 Safenlp	442	UNSAT	7.12	3.83	X	1.11	26.0	1.57	15.4	-
2024 Safenlp	443	UNSAT	8.33	3.65	X	1.26	-	1.52	-	-
2024 Safenlp	444	UNSAT	8.32	3.74	X	1.39	-	1.53	-	-
2024 Safenlp	445	UNSAT	10.8	-	X	-	-	-	-	-
2024 Safenlp	446	UNSAT	7.13	3.80	6.09	1.18	25.6	1.52	13.0	-
2024 Safenlp	447	UNSAT	8.45	11.5	6.09	2.34	-	-	22.3	-
2024 Safenlp	448	UNSAT	8.06	3.60	1.09	1.30	24.8	1.53	14.2	-
2024 Safenlp	449	UNSAT	7.83	3.63	1.09	1.40	23.9	1.53	16.3	-
2024 Safenlp	450	UNSAT	11.1	-	14.2	-	-	-	-	-
2024 Safenlp	451	UNSAT	8.33	3.71	X	1.39	-	1.53	-	-
2024 Safenlp	452	UNSAT	7.13	3.75	6.09	1.16	26.0	1.52	13.7	-
2024 Safenlp	453	UNSAT	8.35	3.68	X	1.37	-	-	18.6	-
2024 Safenlp	454	UNSAT	8.25	3.64	1.09	1.35	24.3	-	14.7	-
2024 Safenlp	455	UNSAT	7.13	3.77	6.09	1.15	27.1	-	15.5	-
2024 Safenlp	456	UNSAT	7.12	3.76	7.10	1.12	25.9	1.52	15.6	-
2024 Safenlp	457	UNSAT	8.34	-	X	-	-	-	-	-
2024 Safenlp	458	UNSAT	7.83	3.68	1.09	1.41	24.5	-	13.9	-
2024 Safenlp	459	UNSAT	8.92	-	7.10	14.4	-	-	-	-
2024 Safenlp	460	UNSAT	8.34	3.73	X	1.45	-	1.53	12.6	-
2024 Safenlp	461	UNSAT	8.33	3.69	3.10	1.39	-	1.53	16.3	-
2024 Safenlp	462	UNSAT	7.13	3.78	X	1.16	26.0	1.53	15.8	-
2024 Safenlp	463	UNSAT	7.69	3.57	1.09	1.32	-	1.53	15.9	-
2024 Safenlp	464	UNSAT	7.87	3.71	1.09	1.42	24.3	-	16.2	-
2024 Safenlp	465	UNSAT	8.31	3.68	2.10	1.36	-	1.53	-	-
2024 Safenlp	466	UNSAT	8.32	3.66	3.10	1.26	-	1.53	-	-
2024 Safenlp	467	UNSAT	8.23	4.25	6.09	1.40	-	-	12.7	-
2024 Safenlp	468	UNSAT	8.66	13.1	7.10	3.12	-	-	15.9	-
2024 Safenlp	469	UNSAT	8.50	-	7.10	20.9	-	-	-	-
2024 Safenlp	470	UNSAT	7.72	3.62	X	1.42	24.1	1.53	13.3	-
2024 Safenlp	471	UNSAT	8.37	6.91	6.09	2.12	-	-	15.7	-
2024 Safenlp	472	UNSAT	8.33	3.65	X	1.38	23.9	1.53	16.4	-
2024 Safenlp	473	UNSAT	7.57	3.65	X	1.24	23.9	1.68	15.4	-
2024 Safenlp	474	UNSAT	7.09	3.82	X	1.17	26.2	-	16.0	-
2024 Safenlp	475	UNSAT	8.09	3.60	3.10	1.39	-	1.53	14.9	-
2024 Safenlp	476	UNSAT	8.30	3.64	X	1.38	-	1.53	-	-
2024 Safenlp	477	UNSAT	7.75	3.58	1.09	1.36	-	1.53	14.3	-
2024 Safenlp	478	UNSAT	9.57	-	18.2	-	-	-	-	-
2024 Safenlp	479	UNSAT	8.36	3.70	3.10	1.31	-	1.53	-	-
2024 Safenlp	480	UNSAT	8.22	3.72	1.09	1.28	24.4	1.53	13.7	-
2024 Safenlp	481	UNSAT	7.78	3.60	1.09	1.31	-	1.53	-	-
2024 Safenlp	482	UNSAT	8.16	3.65	3.10	1.24	-	1.52	13.9	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	483	UNSAT	8.34	3.69	X	1.25	-	1.53	-	-
2024 Safenlp	484	UNSAT	8.33	3.73	X	1.26	-	1.53	-	-
2024 Safenlp	485	UNSAT	7.70	3.57	1.09	1.45	24.4	-	12.7	-
2024 Safenlp	486	UNSAT	8.66	-	X	-	-	-	-	-
2024 Safenlp	487	UNSAT	8.34	3.73	X	1.28	-	1.53	-	-
2024 Safenlp	488	UNSAT	8.23	3.62	X	1.37	-	1.53	-	-
2024 Safenlp	489	UNSAT	7.12	3.84	6.09	1.16	25.8	1.52	13.4	-
2024 Safenlp	490	UNSAT	7.84	3.61	1.09	1.37	24.0	1.53	16.3	-
2024 Safenlp	491	UNSAT	8.21	3.68	X	1.40	-	1.53	-	-
2024 Safenlp	492	UNSAT	8.16	3.63	3.10	1.26	-	1.52	-	-
2024 Safenlp	493	UNSAT	7.14	3.79	X	1.18	26.6	1.52	12.8	-
2024 Safenlp	494	UNSAT	8.32	-	3.10	1.99	-	-	-	-
2024 Safenlp	495	UNSAT	8.10	3.72	3.10	1.35	-	1.52	-	-
2024 Safenlp	496	UNSAT	7.76	3.59	1.09	1.45	25.0	-	14.3	-
2024 Safenlp	497	UNSAT	7.14	3.83	6.09	1.18	25.8	1.52	16.9	-
2024 Safenlp	498	UNSAT	8.09	3.70	3.10	1.38	-	1.53	-	-
2024 Safenlp	499	UNSAT	7.14	3.78	6.09	1.16	25.9	1.59	13.6	-
2024 Safenlp	500	UNSAT	8.21	3.66	X	1.42	-	1.53	-	-
2024 Safenlp	501	UNSAT	8.16	4.12	3.10	1.41	-	-	-	-
2024 Safenlp	502	UNSAT	8.52	11.8	7.10	3.17	-	-	-	-
2024 Safenlp	503	UNSAT	8.34	3.65	X	1.35	-	1.53	-	-
2024 Safenlp	504	UNSAT	7.65	3.62	1.09	1.31	24.8	-	13.4	-
2024 Safenlp	505	UNSAT	8.27	-	X	1.39	-	-	-	-
2024 Safenlp	506	UNSAT	8.31	11.2	7.10	3.00	-	-	-	-
2024 Safenlp	507	UNSAT	10.7	-	15.2	-	-	-	-	-
2024 Safenlp	508	UNSAT	7.73	3.72	1.09	1.42	23.9	1.53	12.5	-
2024 Safenlp	509	UNSAT	7.15	3.81	6.09	1.16	25.6	1.52	16.1	-
2024 Safenlp	510	UNSAT	8.46	4.75	6.09	1.51	-	-	15.8	-
2024 Safenlp	511	UNSAT	7.13	3.80	7.10	1.13	26.6	1.52	16.2	-
2024 Safenlp	512	UNSAT	7.10	3.81	6.09	1.09	25.9	1.53	16.1	-
2024 Safenlp	513	UNSAT	7.79	3.66	1.09	1.09	24.7	-	16.2	-
2024 Safenlp	514	UNSAT	8.18	3.67	3.10	1.39	-	1.52	15.7	-
2024 Safenlp	515	UNSAT	7.65	3.58	1.09	1.31	-	1.52	16.6	-
2024 Safenlp	516	UNSAT	8.59	-	7.10	5.26	-	-	-	-
2024 Safenlp	517	UNSAT	8.90	-	7.10	-	-	-	-	-
2024 Safenlp	518	UNSAT	7.92	3.68	X	1.28	-	1.53	-	-
2024 Safenlp	519	UNSAT	8.31	-	X	1.99	-	-	-	-
2024 Safenlp	520	UNSAT	8.36	-	X	1.81	-	-	-	-
2024 Safenlp	521	UNSAT	8.44	11.1	6.09	2.85	-	-	17.9	-
2024 Safenlp	522	UNSAT	8.32	3.75	X	1.36	-	-	-	-
2024 Safenlp	523	UNSAT	8.72	-	7.10	-	-	-	-	-
2024 Safenlp	524	UNSAT	8.32	-	X	5.68	-	-	14.0	-
2024 Safenlp	525	UNSAT	8.34	3.64	X	1.29	24.1	1.53	16.9	-
2024 Safenlp	526	UNSAT	8.34	3.70	3.10	1.28	-	1.53	-	-
2024 Safenlp	527	UNSAT	7.11	3.77	6.09	1.11	26.1	1.52	13.9	-
2024 Safenlp	528	UNSAT	7.84	3.69	1.09	1.38	-	1.53	15.9	-
2024 Safenlp	529	UNSAT	8.33	3.67	X	1.35	-	1.53	-	-
2024 Safenlp	530	UNSAT	10.3	-	23.2	-	-	-	-	-
2024 Safenlp	531	UNSAT	8.33	4.05	X	1.41	-	1.53	17.9	-
2024 Safenlp	532	UNSAT	7.60	3.63	1.09	1.40	23.9	1.53	16.2	-
2024 Safenlp	533	UNSAT	8.87	-	X	-	-	-	-	-
2024 Safenlp	534	UNSAT	8.45	4.33	X	1.54	-	-	14.6	-
2024 Safenlp	535	UNSAT	9.03	-	7.10	-	-	-	-	-
2024 Safenlp	536	UNSAT	7.71	3.60	1.09	1.26	24.2	-	14.1	-
2024 Safenlp	537	UNSAT	8.27	3.70	X	1.26	-	-	-	-
2024 Safenlp	538	UNSAT	13.9	-	17.2	-	-	-	-	-
2024 Safenlp	539	UNSAT	9.74	-	7.10	-	-	-	-	-
2024 Safenlp	540	UNSAT	7.78	3.72	X	1.32	24.3	1.52	14.0	-
2024 Safenlp	541	UNSAT	7.68	3.54	1.09	1.34	24.5	1.52	16.6	-
2024 Safenlp	542	UNSAT	8.08	3.68	X	1.29	-	1.52	-	-
2024 Safenlp	543	UNSAT	8.09	3.60	3.10	1.38	-	-	-	-
2024 Safenlp	544	UNSAT	8.03	4.38	X	1.60	-	1.54	-	-
2024 Safenlp	545	UNSAT	8.18	3.69	7.10	1.29	-	1.53	-	-
2024 Safenlp	546	UNSAT	8.56	-	X	-	-	-	-	-
2024 Safenlp	547	UNSAT	8.22	3.72	X	1.27	24.3	1.53	14.7	-
2024 Safenlp	548	UNSAT	8.10	3.65	X	1.27	-	-	-	-
2024 Safenlp	549	UNSAT	7.68	3.59	1.09	1.24	24.8	1.53	13.9	-
2024 Safenlp	550	UNSAT	8.30	7.36	6.09	2.29	-	-	16.9	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$	$\beta$	C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	551	UNSAT	8.31	3.68		X	1.25	-	1.53	16.0	-	-
2024 Safenlp	552	UNSAT	8.29	3.69		3.10	1.27	-	1.53	-	-	-
2024 Safenlp	553	UNSAT	8.52	19.9		X	2.46	-	-	14.4	-	-
2024 Safenlp	554	UNSAT	7.76	3.69		1.09	1.25	-	1.53	-	-	-
2024 Safenlp	555	UNSAT	8.97	-		7.10	-	-	-	-	-	-
2024 Safenlp	556	UNSAT	7.64	3.62		1.09	1.26	-	1.53	-	-	-
2024 Safenlp	557	UNSAT	8.16	-		4.11	-	-	-	-	-	-
2024 Safenlp	558	UNSAT	8.18	4.18		X	1.43	-	1.52	-	-	-
2024 Safenlp	559	UNSAT	7.12	3.83		6.09	1.14	26.2	1.53	14.5	-	-
2024 Safenlp	560	UNSAT	8.07	3.65		X	1.32	-	1.53	-	-	-
2024 Safenlp	561	UNSAT	8.25	3.68		X	1.40	-	1.53	-	-	-
2024 Safenlp	562	UNSAT	8.13	3.69		3.10	1.35	-	1.53	-	-	-
2024 Safenlp	563	UNSAT	7.80	3.74		1.09	1.27	-	1.53	14.3	-	-
2024 Safenlp	564	UNSAT	8.16	3.69		3.10	1.24	-	1.55	-	-	-
2024 Safenlp	565	UNSAT	8.07	3.66		3.10	1.24	-	1.53	14.0	-	-
2024 Safenlp	566	UNSAT	10.4	-		11.1	-	-	-	-	-	-
2024 Safenlp	567	UNSAT	8.26	5.76		6.09	2.08	-	-	14.7	-	-
2024 Safenlp	568	UNSAT	7.84	3.59		1.09	1.31	-	1.53	17.3	-	-
2024 Safenlp	569	UNSAT	7.13	3.76		6.09	1.22	26.3	1.52	16.8	-	-
2024 Safenlp	570	UNSAT	8.46	-		7.10	20.2	-	-	-	-	-
2024 Safenlp	571	UNSAT	8.09	3.61		3.10	1.30	-	1.79	-	-	-
2024 Safenlp	572	UNSAT	8.52	7.82		6.09	2.25	-	-	16.7	-	-
2024 Safenlp	573	UNSAT	7.13	3.74		6.09	1.16	25.4	1.52	16.6	-	-
2024 Safenlp	574	UNSAT	7.82	3.60		1.09	1.34	24.7	-	16.5	-	-
2024 Safenlp	575	UNSAT	7.11	3.78		X	1.17	25.8	1.58	15.9	-	-
2024 Safenlp	576	UNSAT	7.13	3.79		6.09	1.22	26.0	1.57	16.4	-	-
2024 Safenlp	577	UNSAT	8.37	3.65		3.10	1.49	-	1.52	-	-	-
2024 Safenlp	578	UNSAT	7.88	3.64		1.09	1.40	24.8	1.53	14.4	-	-
2024 Safenlp	579	UNSAT	10.2	-		9.12	-	-	-	-	-	-
2024 Safenlp	580	UNSAT	8.92	-		7.10	-	-	-	-	-	-
2024 Safenlp	581	UNSAT	8.23	3.64		X	1.33	-	1.53	-	-	-
2024 Safenlp	582	UNSAT	10.8	-		30.3	-	-	-	-	-	-
2024 Safenlp	583	UNSAT	8.44	7.41		7.10	1.81	-	-	14.5	-	-
2024 Safenlp	584	UNSAT	7.83	3.59		1.09	1.35	24.2	-	17.5	-	-
2024 Safenlp	585	UNSAT	7.73	3.64		1.09	1.40	-	1.53	16.5	-	-
2024 Safenlp	586	UNSAT	8.16	-		3.10	-	-	-	-	-	-
2024 Safenlp	587	UNSAT	8.37	3.73		1.09	1.29	-	1.52	-	-	-
2024 Safenlp	588	UNSAT	8.28	3.70		3.10	1.39	-	1.53	-	-	-
2024 Safenlp	589	UNSAT	8.20	-		X	1.89	-	1.52	-	-	-
2024 Safenlp	590	UNSAT	8.32	3.72		3.10	1.37	-	1.52	-	-	-
2024 Safenlp	591	UNSAT	8.57	21.3		X	3.23	-	-	14.3	-	-
2024 Safenlp	592	UNSAT	7.42	3.85		6.09	1.19	26.2	-	17.3	-	-
2024 Safenlp	593	UNSAT	8.28	3.65		1.09	1.34	-	1.53	-	-	-
2024 Safenlp	594	UNSAT	8.33	3.66		X	1.33	-	1.52	-	-	-
2024 Safenlp	595	UNSAT	8.32	4.07		3.10	1.40	-	1.52	-	-	-
2024 Safenlp	596	UNSAT	8.34	3.76		X	1.47	-	-	-	-	-
2024 Safenlp	597	UNSAT	8.35	3.71		X	1.39	-	1.53	-	-	-
2024 Safenlp	598	UNSAT	7.11	3.78		6.09	1.22	25.5	1.58	14.1	-	-
2024 Safenlp	599	UNSAT	8.29	3.65		X	1.36	-	1.52	-	-	-
2024 Safenlp	600	UNSAT	8.20	3.72		3.10	1.34	-	1.53	-	-	-
2024 Safenlp	601	UNSAT	8.32	-		3.10	1.49	-	-	-	-	-
2024 Safenlp	602	UNSAT	7.56	3.64		1.09	1.28	24.2	1.53	14.6	-	-
2024 Safenlp	603	UNSAT	8.20	3.63		X	1.30	-	1.52	-	-	-
2024 Safenlp	604	UNSAT	7.13	3.75		X	1.20	26.2	1.52	14.9	-	-
2024 Safenlp	605	UNSAT	7.14	3.76		X	1.17	25.7	1.52	16.6	-	-
2024 Safenlp	606	UNSAT	7.14	3.77		7.10	1.22	25.5	1.52	16.3	-	-
2024 Safenlp	607	UNSAT	8.14	3.71		3.10	1.36	-	1.53	15.9	-	-
2024 Safenlp	608	UNSAT	8.15	3.67		X	1.41	-	1.53	-	-	-
2024 Safenlp	609	UNSAT	8.20	-		3.10	1.59	-	-	-	-	-
2024 Safenlp	610	UNSAT	7.14	3.80		X	1.17	26.8	1.59	14.4	-	-
2024 Safenlp	611	UNSAT	8.34	3.64		X	1.35	-	1.53	-	-	-
2024 Safenlp	612	UNSAT	10.5	-		9.11	-	-	-	-	-	-
2024 Safenlp	613	UNSAT	14.1	-		24.2	-	-	-	-	-	-
2024 Safenlp	614	UNSAT	8.36	23.3		6.09	4.52	-	-	-	-	-
2024 Safenlp	615	UNSAT	9.02	19.4		7.10	3.58	-	-	-	-	-
2024 Safenlp	616	UNSAT	7.12	3.75		X	1.23	27.1	1.52	14.3	-	-
2024 Safenlp	617	UNSAT	8.45	-		X	-	-	-	-	-	-
2024 Safenlp	618	UNSAT	8.39	-		X	1.67	-	-	-	-	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	619	UNSAT	8.38	3.72	3.10	1.24	-	1.53	-	-
2024 Safenlp	620	UNSAT	8.31	-	6.10	7.46	-	-	-	-
2024 Safenlp	621	UNSAT	8.29	-	3.10	1.91	-	-	-	-
2024 Safenlp	622	UNSAT	7.17	3.78	X	1.19	26.7	1.52	14.3	-
2024 Safenlp	623	UNSAT	7.15	3.74	6.09	1.13	26.1	1.53	16.7	-
2024 Safenlp	624	UNSAT	9.00	-	X	-	-	-	-	-
2024 Safenlp	625	UNSAT	7.59	3.69	1.09	1.33	24.0	-	14.8	-
2024 Safenlp	626	UNSAT	8.35	-	X	1.38	-	-	-	-
2024 Safenlp	627	UNSAT	8.74	-	7.10	20.1	-	-	-	-
2024 Safenlp	628	UNSAT	8.29	3.68	X	1.44	-	1.52	-	-
2024 Safenlp	629	UNSAT	8.30	3.74	3.10	1.40	-	1.52	13.9	-
2024 Safenlp	630	UNSAT	7.91	3.72	3.10	1.30	-	1.53	-	-
2024 Safenlp	631	UNSAT	8.18	3.57	3.10	1.32	-	-	-	-
2024 Safenlp	632	UNSAT	8.46	4.30	X	1.73	-	-	14.3	-
2024 Safenlp	633	UNSAT	8.37	-	X	4.80	-	-	16.7	-
2024 Safenlp	634	UNSAT	7.83	3.59	X	1.27	24.4	1.53	16.7	-
2024 Safenlp	635	UNSAT	7.13	3.81	X	1.07	26.7	1.52	17.1	-
2024 Safenlp	636	UNSAT	7.63	3.70	1.09	1.24	23.7	1.55	17.1	-
2024 Safenlp	637	UNSAT	8.12	3.66	X	1.27	-	1.53	16.6	-
2024 Safenlp	638	UNSAT	7.75	3.62	1.09	1.24	-	-	17.2	-
2024 Safenlp	639	UNSAT	8.38	3.72	X	1.25	-	1.52	-	-
2024 Safenlp	640	UNSAT	8.14	3.69	3.10	1.26	-	1.53	-	-
2024 Safenlp	641	UNSAT	8.83	-	7.10	-	-	-	-	-
2024 Safenlp	642	UNSAT	8.26	5.46	X	1.81	-	-	14.9	-
2024 Safenlp	643	UNSAT	8.95	-	8.11	17.7	-	-	-	-
2024 Safenlp	644	UNSAT	7.83	3.60	1.09	1.08	24.0	1.53	14.4	-
2024 Safenlp	645	UNSAT	8.18	3.65	X	1.37	-	1.52	-	-
2024 Safenlp	646	UNSAT	8.32	4.14	X	1.32	-	-	-	-
2024 Safenlp	647	UNSAT	8.35	10.8	6.09	2.31	-	-	-	-
2024 Safenlp	648	UNSAT	8.46	4.10	6.09	1.67	-	-	14.5	-
2024 Safenlp	649	UNSAT	7.11	3.77	7.10	1.12	25.5	1.53	17.5	-
2024 Safenlp	650	UNSAT	8.34	3.63	1.09	1.33	-	1.53	17.0	-
2024 Safenlp	651	UNSAT	7.17	3.81	6.09	1.09	26.0	1.52	16.5	-
2024 Safenlp	652	UNSAT	7.12	3.75	6.09	1.07	26.5	1.52	17.2	-
2024 Safenlp	653	UNSAT	8.25	-	3.10	1.25	-	-	-	-
2024 Safenlp	654	UNSAT	7.63	3.64	1.09	1.22	24.7	1.53	14.6	-
2024 Safenlp	655	UNSAT	8.16	3.66	3.10	1.25	-	1.52	-	-
2024 Safenlp	656	UNSAT	8.33	17.9	6.09	2.27	-	-	15.0	-
2024 Safenlp	657	UNSAT	7.15	3.74	X	1.17	26.3	1.52	17.6	-
2024 Safenlp	658	UNSAT	7.10	3.84	6.09	1.20	26.4	1.52	16.6	-
2024 Safenlp	659	UNSAT	7.46	4.06	X	1.22	26.4	-	16.9	-
2024 Safenlp	660	UNSAT	8.48	12.3	6.09	3.09	-	-	-	-
2024 Safenlp	661	UNSAT	8.33	3.73	3.10	1.37	-	1.53	-	-
2024 Safenlp	662	UNSAT	8.15	3.65	X	1.33	-	1.53	-	-
2024 Safenlp	663	UNSAT	8.34	4.03	3.10	1.44	-	1.53	-	-
2024 Safenlp	664	UNSAT	7.12	3.73	6.09	1.17	25.5	1.52	14.4	-
2024 Safenlp	665	UNSAT	7.83	3.58	1.09	1.42	24.8	1.53	17.4	-
2024 Safenlp	666	UNSAT	8.12	3.68	X	1.38	-	1.53	16.4	-
2024 Safenlp	667	UNSAT	7.85	3.59	1.09	1.42	-	1.53	16.1	-
2024 Safenlp	668	UNSAT	7.13	3.75	6.09	1.14	26.1	1.52	17.1	-
2024 Safenlp	669	UNSAT	8.31	3.63	3.10	1.34	-	1.52	17.0	-
2024 Safenlp	670	UNSAT	7.86	3.67	X	1.35	-	1.52	16.9	-
2024 Safenlp	671	UNSAT	7.87	3.58	1.09	1.40	23.9	-	17.9	-
2024 Safenlp	672	UNSAT	8.30	13.3	X	2.56	-	-	16.2	-
2024 Safenlp	673	UNSAT	7.69	3.63	1.09	1.39	24.0	-	16.7	-
2024 Safenlp	674	UNSAT	8.13	3.68	3.10	1.38	-	1.53	-	-
2024 Safenlp	675	UNSAT	8.08	3.71	X	1.39	-	1.53	-	-
2024 Safenlp	676	UNSAT	7.84	3.63	1.09	1.39	-	-	15.4	-
2024 Safenlp	677	UNSAT	8.44	17.2	X	2.56	-	-	17.9	-
2024 Safenlp	678	UNSAT	7.82	3.66	1.09	1.41	23.6	1.53	16.8	-
2024 Safenlp	679	UNSAT	8.43	8.01	6.09	2.25	-	-	27.8	-
2024 Safenlp	680	UNSAT	8.94	-	8.11	14.1	-	-	-	-
2024 Safenlp	681	UNSAT	7.13	3.81	6.09	1.09	26.7	1.53	15.3	-
2024 Safenlp	682	UNSAT	7.13	3.79	X	1.18	25.4	1.59	17.8	-
2024 Safenlp	683	UNSAT	7.83	3.69	1.09	1.29	24.3	-	17.3	-
2024 Safenlp	684	UNSAT	8.20	-	X	1.27	-	1.52	-	-
2024 Safenlp	685	UNSAT	8.28	4.13	X	1.29	-	-	15.0	-
2024 Safenlp	686	UNSAT	7.79	3.67	1.09	1.32	24.1	-	17.9	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	687	UNSAT	8.34	3.68	X	1.30	-	1.53	16.8	-
2024 Safenlp	688	UNSAT	8.18	-	X	1.35	-	1.53	-	-
2024 Safenlp	689	UNSAT	8.06	3.63	X	1.39	-	1.53	-	-
2024 Safenlp	690	UNSAT	8.26	-	X	1.33	-	-	-	-
2024 Safenlp	691	UNSAT	8.09	3.62	X	1.38	-	1.53	-	-
2024 Safenlp	692	UNSAT	10.0	-	X	-	-	-	-	-
2024 Safenlp	693	UNSAT	7.89	3.70	1.09	1.43	24.1	1.53	14.4	-
2024 Safenlp	694	UNSAT	8.34	7.99	6.09	2.06	-	-	19.0	-
2024 Safenlp	695	UNSAT	8.26	3.75	X	1.36	-	1.53	-	-
2024 Safenlp	696	UNSAT	8.32	3.69	3.10	1.36	-	1.52	-	-
2024 Safenlp	697	UNSAT	9.46	-	15.2	-	-	-	-	-
2024 Safenlp	698	UNSAT	8.38	3.69	3.10	1.23	-	1.52	-	-
2024 Safenlp	699	UNSAT	7.76	3.64	1.09	1.10	25.0	1.83	15.7	-
2024 Safenlp	700	UNSAT	7.78	3.64	X	1.33	24.8	1.53	16.9	-
2024 Safenlp	701	UNSAT	7.82	3.60	1.09	1.30	-	1.53	17.3	-
2024 Safenlp	702	UNSAT	7.17	3.79	6.09	1.11	26.4	1.52	16.9	-
2024 Safenlp	703	UNSAT	8.23	3.72	3.10	1.31	-	1.53	-	-
2024 Safenlp	704	UNSAT	8.30	3.74	3.10	1.34	-	1.52	-	-
2024 Safenlp	705	UNSAT	8.40	14.9	X	2.29	-	-	15.1	-
2024 Safenlp	706	UNSAT	8.52	6.23	6.09	2.04	-	-	17.9	-
2024 Safenlp	707	UNSAT	8.33	3.72	3.10	1.26	-	1.54	-	-
2024 Safenlp	708	UNSAT	10.8	-	24.2	-	-	-	-	-
2024 Safenlp	709	UNSAT	7.12	3.76	X	1.19	26.1	1.52	15.1	-
2024 Safenlp	710	UNSAT	7.64	3.57	2.10	1.38	-	1.53	-	-
2024 Safenlp	711	UNSAT	8.91	-	7.10	12.2	-	-	-	-
2024 Safenlp	712	UNSAT	8.35	3.63	3.10	1.36	-	1.53	-	-
2024 Safenlp	713	UNSAT	8.32	3.57	2.10	1.30	-	-	15.0	-
2024 Safenlp	714	UNSAT	8.32	3.65	X	1.24	-	-	-	-
2024 Safenlp	715	UNSAT	9.55	-	7.10	-	-	-	-	-
2024 Safenlp	716	UNSAT	7.13	3.74	6.09	1.22	25.7	1.58	14.6	-
2024 Safenlp	717	UNSAT	8.09	3.62	X	1.28	-	1.52	-	-
2024 Safenlp	718	UNSAT	8.21	3.64	X	1.27	-	1.52	16.2	-
2024 Safenlp	719	UNSAT	8.24	3.65	X	1.28	-	1.53	-	-
2024 Safenlp	720	UNSAT	8.38	3.72	X	1.28	-	1.53	-	-
2024 Safenlp	721	UNSAT	8.13	3.71	X	1.24	-	1.53	-	-
2024 Safenlp	722	UNSAT	7.11	3.70	6.09	1.09	25.7	1.57	14.9	-
2024 Safenlp	723	UNSAT	7.11	3.81	6.09	1.10	26.7	1.55	19.0	-
2024 Safenlp	724	UNSAT	8.53	8.94	6.09	2.54	-	-	17.3	-
2024 Safenlp	725	UNSAT	7.83	3.57	X	1.35	24.6	1.53	17.3	-
2024 Safenlp	726	UNSAT	8.35	8.93	6.09	2.58	-	-	17.9	-
2024 Safenlp	727	UNSAT	7.84	3.66	1.09	1.35	24.7	1.53	17.4	-
2024 Safenlp	728	UNSAT	8.18	3.62	1.09	1.33	-	1.53	-	-
2024 Safenlp	729	UNSAT	8.17	3.69	3.10	1.37	-	1.53	16.1	-
2024 Safenlp	730	UNSAT	8.13	3.66	X	1.41	-	1.53	-	-
2024 Safenlp	731	UNSAT	8.60	-	X	-	-	-	-	-
2024 Safenlp	732	UNSAT	8.83	-	7.10	14.6	-	-	-	-
2024 Safenlp	733	UNSAT	7.12	3.84	6.09	1.16	26.5	1.56	15.7	-
2024 Safenlp	734	UNSAT	7.11	3.87	X	1.20	27.1	1.52	17.4	-
2024 Safenlp	735	UNSAT	7.13	3.83	X	1.13	26.7	1.58	16.8	-
2024 Safenlp	736	UNSAT	8.32	3.62	3.10	1.27	-	1.53	-	-
2024 Safenlp	737	UNSAT	8.50	-	X	-	-	-	-	-
2024 Safenlp	738	UNSAT	8.24	3.64	X	1.34	24.4	-	15.3	-
2024 Safenlp	739	UNSAT	8.17	3.64	3.10	1.39	-	1.53	18.1	-
2024 Safenlp	740	UNSAT	8.33	3.97	X	1.80	-	-	-	-
2024 Safenlp	741	UNSAT	7.11	3.78	6.09	1.08	26.8	1.54	15.6	-
2024 Safenlp	742	UNSAT	9.50	-	7.10	-	-	-	-	-
2024 Safenlp	743	UNSAT	8.31	3.68	X	1.26	-	-	-	-
2024 Safenlp	744	UNSAT	8.31	3.68	3.10	1.27	-	-	-	-
2024 Safenlp	745	UNSAT	8.32	-	X	2.35	-	-	-	-
2024 Safenlp	746	UNSAT	8.10	4.03	X	1.38	-	1.53	-	-
2024 Safenlp	747	UNSAT	8.34	3.60	X	1.27	-	1.52	-	-
2024 Safenlp	748	UNSAT	8.16	3.67	X	1.47	-	-	-	-
2024 Safenlp	749	UNSAT	7.87	3.56	1.09	1.23	24.2	1.53	15.5	-
2024 Safenlp	750	UNSAT	7.83	3.60	1.09	1.26	-	-	18.3	-
2024 Safenlp	751	UNSAT	9.62	-	16.2	-	-	-	-	-
2024 Safenlp	752	UNSAT	8.77	-	7.10	-	-	-	-	-
2024 Safenlp	753	UNSAT	8.23	3.71	X	1.37	-	1.53	-	-
2024 Safenlp	754	UNSAT	8.28	3.65	X	1.35	-	1.53	-	-



Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	755	UNSAT	7.14	3.80	6.09	1.10	27.2	1.52	16.2	-
2024 Safenlp	756	UNSAT	7.73	3.61	1.09	1.24	24.9	1.53	18.7	-
2024 Safenlp	757	UNSAT	8.33	8.21	6.09	2.34	-	-	17.0	-
2024 Safenlp	758	UNSAT	8.55	-	7.10	9.97	-	-	-	-
2024 Safenlp	759	UNSAT	8.23	3.62	3.10	1.36	24.5	1.53	14.2	-
2024 Safenlp	760	UNSAT	8.35	-	3.10	1.53	-	-	-	-
2024 Safenlp	761	UNSAT	8.11	3.61	X	1.31	-	-	-	-
2024 Safenlp	762	UNSAT	16.8	-	39.4	-	-	-	-	-
2024 Safenlp	763	UNSAT	7.14	3.78	X	1.12	27.0	1.52	15.5	-
2024 Safenlp	764	UNSAT	8.19	3.66	X	1.24	-	1.53	-	-
2024 Safenlp	765	UNSAT	7.82	3.61	1.09	1.25	-	1.53	15.7	-
2024 Safenlp	766	UNSAT	7.13	3.78	6.09	1.07	27.3	1.52	16.7	-
2024 Safenlp	767	UNSAT	7.14	3.76	6.19	1.07	25.5	1.56	15.9	-
2024 Safenlp	768	UNSAT	8.11	-	X	-	-	-	-	-
2024 Safenlp	769	UNSAT	8.99	-	7.10	-	-	-	-	-
2024 Safenlp	770	UNSAT	7.40	3.78	6.09	1.15	27.1	1.52	15.1	-
2024 Safenlp	771	UNSAT	7.14	3.83	6.09	1.12	27.3	1.52	18.2	-
2024 Safenlp	772	UNSAT	8.33	3.66	X	1.31	-	1.53	-	-
2024 Safenlp	773	UNSAT	7.11	3.76	7.10	1.12	-	1.53	16.2	-
2024 Safenlp	774	UNSAT	8.32	-	3.10	1.29	-	1.53	-	-
2024 Safenlp	775	UNSAT	7.88	3.66	1.09	1.27	-	1.55	15.1	-
2024 Safenlp	776	UNSAT	8.78	-	7.10	14.9	-	-	-	-
2024 Safenlp	777	UNSAT	8.04	3.62	X	1.36	-	1.52	-	-
2024 Safenlp	778	UNSAT	8.36	6.59	6.09	1.96	-	-	16.0	-
2024 Safenlp	779	UNSAT	8.32	3.70	X	1.33	-	1.53	-	-
2024 Safenlp	780	UNSAT	8.25	4.10	X	1.33	-	-	-	-
2024 Safenlp	781	UNSAT	7.11	3.76	6.09	1.16	25.7	1.52	15.6	-
2024 Safenlp	782	UNSAT	8.12	3.69	3.10	1.29	-	1.52	-	-
2024 Safenlp	783	UNSAT	7.97	3.57	X	1.33	-	1.52	17.6	-
2024 Safenlp	784	UNSAT	8.24	4.06	3.10	1.74	-	-	-	-
2024 Safenlp	785	UNSAT	8.12	3.66	X	1.38	-	1.53	-	-
2024 Safenlp	786	UNSAT	8.29	3.66	3.10	1.33	-	1.53	14.6	-
2024 Safenlp	787	UNSAT	7.13	3.79	7.10	1.16	25.4	1.51	17.5	-
2024 Safenlp	788	UNSAT	8.34	3.69	3.10	1.27	-	1.53	-	-
2024 Safenlp	789	UNSAT	7.11	3.88	X	1.08	27.2	1.52	15.7	-
2024 Safenlp	790	UNSAT	8.34	7.34	6.09	2.35	-	-	26.1	-
2024 Safenlp	791	UNSAT	8.30	3.66	X	1.33	-	1.53	-	-
2024 Safenlp	792	UNSAT	8.43	8.43	6.09	2.49	-	-	-	-
2024 Safenlp	793	UNSAT	7.68	3.60	X	1.17	24.7	1.53	15.6	-
2024 Safenlp	794	UNSAT	7.83	3.63	1.09	1.45	24.8	1.52	19.1	-
2024 Safenlp	795	UNSAT	7.84	3.69	1.09	1.34	24.8	1.53	17.6	-
2024 Safenlp	796	UNSAT	8.23	3.65	X	1.32	-	1.52	-	-
2024 Safenlp	797	UNSAT	8.32	3.69	X	1.42	-	1.53	-	-
2024 Safenlp	798	UNSAT	7.13	3.78	6.09	1.25	26.9	1.52	16.0	-
2024 Safenlp	799	UNSAT	8.11	3.68	X	1.36	-	1.53	-	-
2024 Safenlp	800	UNSAT	8.36	-	3.10	1.88	-	-	-	-
2024 Safenlp	801	UNSAT	7.11	3.78	X	1.15	26.7	1.52	15.9	-
2024 Safenlp	802	UNSAT	8.38	-	6.09	6.99	-	-	-	-
2024 Safenlp	803	UNSAT	7.12	3.79	6.09	1.16	26.1	1.53	15.7	-
2024 Safenlp	804	UNSAT	8.54	-	7.10	14.5	-	-	-	-
2024 Safenlp	805	UNSAT	8.25	3.72	X	1.30	-	1.53	-	-
2024 Safenlp	806	UNSAT	7.84	3.72	1.09	1.32	-	1.53	16.1	-
2024 Safenlp	807	UNSAT	9.49	-	11.1	-	-	-	-	-
2024 Safenlp	808	UNSAT	7.12	3.80	6.09	1.17	26.9	1.52	16.0	-
2024 Safenlp	809	UNSAT	8.15	3.69	3.10	1.36	-	-	-	-
2024 Safenlp	810	UNSAT	7.14	3.76	X	1.20	25.7	1.53	15.9	-
2024 Safenlp	811	UNSAT	9.60	-	8.11	-	-	-	-	-
2024 Safenlp	812	UNSAT	12.1	-	67.6	-	-	-	-	-
2024 Safenlp	813	UNSAT	8.28	-	X	1.74	-	-	-	-
2024 Safenlp	814	UNSAT	9.09	-	7.10	-	-	-	-	-
2024 Safenlp	815	UNSAT	8.18	3.67	X	1.29	-	1.53	-	-
2024 Safenlp	816	UNSAT	7.64	3.64	1.09	1.15	24.4	1.84	15.9	-
2024 Safenlp	817	UNSAT	7.12	3.83	X	1.15	27.0	1.52	19.8	-
2024 Safenlp	818	UNSAT	8.91	-	7.10	-	-	-	-	-
2024 Safenlp	819	UNSAT	7.11	3.78	6.09	1.15	26.2	1.59	15.4	-
2024 Safenlp	820	UNSAT	8.31	3.62	1.09	1.44	24.3	1.52	18.8	-
2024 Safenlp	821	UNSAT	8.47	9.71	6.09	2.50	-	-	-	-
2024 Safenlp	822	UNSAT	8.35	-	X	1.35	-	-	-	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$	$\beta$	C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	823	UNSAT	8.08	3.63		X	1.36	-	1.53	-	-	-
2024 Safenlp	824	UNSAT	8.23	4.04		X	1.48	-	-	-	-	-
2024 Safenlp	825	UNSAT	8.29	3.72	1.09		1.27	24.7	1.53	15.8	-	-
2024 Safenlp	826	UNSAT	8.54	-		X	-	-	-	-	-	-
2024 Safenlp	827	UNSAT	8.31	3.73		X	1.54	-	1.53	-	-	-
2024 Safenlp	828	UNSAT	7.13	3.76		X	1.19	27.0	1.52	15.8	-	-
2024 Safenlp	829	UNSAT	8.26	3.69	1.09		1.32	-	1.52	-	-	-
2024 Safenlp	830	UNSAT	8.15	3.68		X	1.39	-	1.53	-	-	-
2024 Safenlp	831	UNSAT	9.74	-	11.1		-	-	-	-	-	-
2024 Safenlp	832	UNSAT	8.51	4.69	6.09		1.74	-	-	15.5	-	-
2024 Safenlp	833	UNSAT	7.58	3.61		X	1.22	-	1.53	18.4	-	-
2024 Safenlp	834	UNSAT	8.18	3.63		X	1.26	-	1.53	-	-	-
2024 Safenlp	835	UNSAT	8.40	3.67		X	1.29	-	1.52	-	-	-
2024 Safenlp	836	UNSAT	8.10	3.58	3.10		1.47	-	1.53	-	-	-
2024 Safenlp	837	UNSAT	8.15	3.65		X	1.34	-	1.53	-	-	-
2024 Safenlp	838	UNSAT	7.87	3.72	1.09		1.39	24.0	1.53	16.2	-	-
2024 Safenlp	839	UNSAT	7.88	3.65	1.09		1.37	23.8	1.53	18.8	-	-
2024 Safenlp	840	UNSAT	7.77	3.67		X	1.33	-	1.52	16.9	-	-
2024 Safenlp	841	UNSAT	8.22	-	3.10		1.79	-	-	-	-	-
2024 Safenlp	842	UNSAT	8.48	4.68	6.09		1.49	-	-	16.1	-	-
2024 Safenlp	843	UNSAT	8.41	8.83	6.09		8.00	-	-	19.2	-	-
2024 Safenlp	844	UNSAT	8.55	9.47	6.09		2.20	-	-	16.9	-	-
2024 Safenlp	845	UNSAT	7.13	3.75		X	1.14	26.3	1.57	17.5	-	-
2024 Safenlp	846	UNSAT	7.88	3.64	1.09		1.38	-	1.53	-	-	-
2024 Safenlp	847	UNSAT	7.14	3.78		X	1.08	25.8	1.52	16.2	-	-
2024 Safenlp	848	UNSAT	8.16	3.63		X	1.41	-	-	-	-	-
2024 Safenlp	849	UNSAT	8.14	4.08	3.10		1.26	-	1.53	-	-	-
2024 Safenlp	850	UNSAT	8.21	3.72		X	1.36	-	1.53	-	-	-
2024 Safenlp	851	UNSAT	8.33	4.16	6.09		1.41	-	-	16.4	-	-
2024 Safenlp	852	UNSAT	7.17	3.78	6.09		1.20	26.2	1.52	18.7	-	-
2024 Safenlp	853	UNSAT	15.0	-	25.2		-	-	-	-	-	-
2024 Safenlp	854	UNSAT	8.35	3.65	3.10		1.31	-	1.52	-	-	-
2024 Safenlp	855	UNSAT	8.19	3.68		X	1.32	-	1.52	-	-	-
2024 Safenlp	856	UNSAT	8.48	8.79	6.09		2.49	-	-	16.7	-	-
2024 Safenlp	857	UNSAT	8.01	4.07	3.10		1.39	-	1.52	-	-	-
2024 Safenlp	858	UNSAT	8.33	3.67		X	1.37	-	1.53	-	-	-
2024 Safenlp	859	UNSAT	8.35	-	3.10		-	-	-	-	-	-
2024 Safenlp	860	UNSAT	9.10	-	7.10		-	-	-	-	-	-
2024 Safenlp	861	UNSAT	10.7	-	9.11		-	-	-	-	-	-
2024 Safenlp	862	UNSAT	7.75	3.68	1.09		1.33	25.4	1.52	16.4	-	-
2024 Safenlp	863	UNSAT	7.12	3.79		X	1.16	26.3	1.52	19.4	-	-
2024 Safenlp	864	UNSAT	10.4	32.3	9.11		-	-	-	-	-	-
2024 Safenlp	865	UNSAT	8.17	3.62		X	1.41	-	1.53	-	-	-
2024 Safenlp	866	UNSAT	9.51	-	9.11		-	-	-	-	-	-
2024 Safenlp	867	UNSAT	8.29	17.1	6.09		3.75	-	-	-	-	-
2024 Safenlp	868	UNSAT	7.66	3.65	1.09		1.43	24.9	-	16.0	-	-
2024 Safenlp	869	UNSAT	8.93	-	7.10		-	-	-	-	-	-
2024 Safenlp	870	UNSAT	7.68	3.56	1.09		1.31	25.1	1.54	16.6	-	-
2024 Safenlp	871	UNSAT	21.3	-	-		-	-	-	-	-	-
2024 Safenlp	872	UNSAT	8.09	-	6.09		1.28	-	1.53	-	-	-
2024 Safenlp	873	UNSAT	8.32	-		X	1.39	-	-	-	-	-
2024 Safenlp	874	UNSAT	8.26	8.51	6.09		2.59	-	-	16.4	-	-
2024 Safenlp	875	UNSAT	7.12	3.86	6.09		1.16	26.6	1.52	18.7	-	-
2024 Safenlp	876	UNSAT	8.32	3.67	2.10		1.45	-	1.53	18.4	-	-
2024 Safenlp	877	UNSAT	7.68	3.59	1.09		1.26	25.0	-	17.9	-	-
2024 Safenlp	878	UNSAT	7.10	3.77	6.09		1.07	25.8	1.53	18.0	-	-
2024 Safenlp	879	UNSAT	7.11	3.75	6.09		1.12	26.6	1.52	16.1	-	-
2024 Safenlp	880	UNSAT	8.17	3.65		X	1.39	-	-	-	-	-
2024 Safenlp	881	UNSAT	8.34	3.68		X	1.36	-	1.52	-	-	-
2024 Safenlp	882	UNSAT	8.39	6.32	6.09		1.94	-	-	17.1	-	-
2024 Safenlp	883	UNSAT	7.15	3.83		X	1.18	25.7	1.52	19.5	-	-
2024 Safenlp	884	UNSAT	8.26	4.09	3.10		1.31	-	1.53	-	-	-
2024 Safenlp	885	UNSAT	7.82	3.68	1.09		1.26	-	1.53	15.6	-	-
2024 Safenlp	886	UNSAT	10.2	-	11.1		-	-	-	-	-	-
2024 Safenlp	887	UNSAT	8.35	4.05	3.10		1.84	-	-	-	-	-
2024 Safenlp	888	UNSAT	7.10	3.83		X	1.19	26.0	1.52	16.3	-	-
2024 Safenlp	889	UNSAT	9.37	-	7.10		-	-	-	-	-	-
2024 Safenlp	890	UNSAT	8.08	-	3.10		1.96	-	-	-	-	-



Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$	$\beta$	C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	891	UNSAT	7.17	3.82		X	1.15	25.9	1.52	16.5	-	-
2024 Safenlp	892	UNSAT	7.11	3.78		6.09	1.17	26.1	1.52	19.4	-	-
2024 Safenlp	893	UNSAT	7.66	3.64		1.09	1.38	24.7	1.53	16.7	-	-
2024 Safenlp	894	UNSAT	10.1	-		8.11	-	-	-	-	-	-
2024 Safenlp	895	UNSAT	8.37	9.72		6.09	2.45	-	-	16.5	-	-
2024 Safenlp	896	UNSAT	7.73	3.69		X	1.40	24.7	1.53	19.1	-	-
2024 Safenlp	897	UNSAT	8.17	3.70		X	1.29	-	1.52	-	-	-
2024 Safenlp	898	UNSAT	8.37	3.58		3.10	1.28	-	1.53	-	-	-
2024 Safenlp	899	UNSAT	8.26	10.3		6.09	2.50	-	-	27.5	-	-
2024 Safenlp	900	UNSAT	7.14	3.70		X	1.09	27.1	1.52	16.8	-	-
2024 Safenlp	901	UNSAT	8.33	3.68		X	1.25	24.0	1.53	18.8	-	-
2024 Safenlp	902	UNSAT	8.35	3.71		3.10	1.30	-	1.53	-	-	-
2024 Safenlp	903	UNSAT	8.25	3.56		X	1.31	-	1.53	-	-	-
2024 Safenlp	904	UNSAT	8.85	-		7.10	8.55	-	-	-	-	-
2024 Safenlp	905	UNSAT	8.36	3.63		X	1.34	-	1.53	-	-	-
2024 Safenlp	906	UNSAT	7.11	3.76		6.09	1.20	25.8	1.59	16.3	-	-
2024 Safenlp	907	UNSAT	7.80	3.67		X	1.42	-	1.53	19.8	-	-
2024 Safenlp	908	UNSAT	8.22	3.68		X	1.37	-	1.53	-	-	-
2024 Safenlp	909	UNSAT	8.55	4.61		6.09	1.67	-	-	16.6	-	-
2024 Safenlp	910	UNSAT	8.47	-		X	4.70	-	-	19.6	-	-
2024 Safenlp	911	UNSAT	8.32	3.65		X	1.34	-	-	-	-	-
2024 Safenlp	912	UNSAT	8.35	3.65		3.10	1.37	-	1.53	16.4	-	-
2024 Safenlp	913	UNSAT	8.28	3.64		X	1.44	-	1.53	-	-	-
2024 Safenlp	914	UNSAT	8.03	3.66		3.10	1.36	-	-	-	-	-
2024 Safenlp	915	UNSAT	8.25	3.69		X	1.33	-	-	-	-	-
2024 Safenlp	916	UNSAT	8.24	3.69		X	1.34	24.7	1.54	16.8	-	-
2024 Safenlp	917	UNSAT	8.97	-		7.10	-	-	-	-	-	-
2024 Safenlp	918	UNSAT	7.11	3.78		X	1.18	26.7	1.59	15.7	-	-
2024 Safenlp	919	UNSAT	8.14	-		3.10	2.53	-	-	-	-	-
2024 Safenlp	920	UNSAT	8.22	3.69		1.09	1.24	24.0	1.53	17.1	-	-
2024 Safenlp	921	UNSAT	7.68	3.65		1.09	1.26	24.4	1.53	18.9	-	-
2024 Safenlp	922	UNSAT	8.51	5.04		6.09	1.68	-	-	18.2	-	-
2024 Safenlp	923	UNSAT	8.19	3.71		X	1.34	-	1.52	-	-	-
2024 Safenlp	924	UNSAT	8.37	-		X	14.3	-	-	19.6	-	-
2024 Safenlp	925	UNSAT	7.81	3.69		1.09	1.27	-	1.53	-	-	-
2024 Safenlp	926	UNSAT	8.68	-		X	-	-	-	-	-	-
2024 Safenlp	927	UNSAT	7.87	3.68		X	1.29	-	1.52	-	-	-
2024 Safenlp	928	UNSAT	7.58	3.59		1.09	1.29	23.9	-	16.8	-	-
2024 Safenlp	929	UNSAT	8.11	-		X	2.22	-	-	-	-	-
2024 Safenlp	930	UNSAT	8.33	3.70		3.10	1.28	-	1.53	16.9	-	-
2024 Safenlp	931	UNSAT	8.24	3.66		3.10	1.28	-	1.53	-	-	-
2024 Safenlp	932	UNSAT	8.17	3.58		1.09	1.39	-	1.53	-	-	-
2024 Safenlp	933	UNSAT	7.10	3.79		X	1.15	26.3	1.52	17.1	-	-
2024 Safenlp	934	UNSAT	8.22	3.63		X	1.25	23.9	1.53	19.6	-	-
2024 Safenlp	935	UNSAT	7.11	3.81		6.09	1.10	26.2	1.52	17.9	-	-
2024 Safenlp	936	UNSAT	7.66	3.60		1.09	1.39	24.1	-	17.3	-	-
2024 Safenlp	937	UNSAT	8.38	-		X	8.33	-	-	30.6	-	-
2024 Safenlp	938	UNSAT	8.31	3.70		X	1.34	-	1.53	-	-	-
2024 Safenlp	939	UNSAT	7.13	3.72		X	1.18	26.5	1.52	16.0	-	-
2024 Safenlp	940	UNSAT	8.31	3.67		X	1.33	-	-	-	-	-
2024 Safenlp	941	UNSAT	8.42	4.72		X	1.67	-	-	16.6	-	-
2024 Safenlp	942	UNSAT	8.28	3.73		X	1.38	-	1.52	18.7	-	-
2024 Safenlp	943	UNSAT	8.55	-		X	-	-	-	-	-	-
2024 Safenlp	944	UNSAT	9.08	-		7.10	-	-	-	-	-	-
2024 Safenlp	945	UNSAT	7.73	3.72		1.09	1.33	24.8	1.52	16.3	-	-
2024 Safenlp	946	UNSAT	17.5	-		-	-	-	-	-	-	-
2024 Safenlp	947	UNSAT	7.85	3.68		3.10	1.40	-	1.53	-	-	-
2024 Safenlp	948	UNSAT	8.40	3.60		1.09	1.43	-	1.53	17.4	-	-
2024 Safenlp	949	UNSAT	9.08	-		X	-	-	-	-	-	-
2024 Safenlp	950	UNSAT	7.14	3.80		7.10	1.19	26.5	1.52	16.7	-	-
2024 Safenlp	951	UNSAT	8.34	-		X	1.60	-	-	-	-	-
2024 Safenlp	952	UNSAT	7.97	3.65		3.10	1.32	-	1.53	-	-	-
2024 Safenlp	953	UNSAT	8.24	-		3.10	-	-	-	-	-	-
2024 Safenlp	954	UNSAT	8.19	3.71		3.10	1.40	-	-	-	-	-
2024 Safenlp	955	UNSAT	8.24	3.66		3.10	1.33	-	1.53	-	-	-
2024 Safenlp	956	UNSAT	7.85	3.60		1.09	1.32	24.7	1.53	17.2	-	-
2024 Safenlp	957	UNSAT	8.50	-		X	-	-	-	-	-	-
2024 Safenlp	958	UNSAT	7.83	3.64		1.09	1.42	24.3	1.53	17.4	-	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$	$\beta$	C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	959	UNSAT	7.15	3.81		X	1.14	26.0	1.52	20.0	-	-
2024 Safenlp	960	UNSAT	7.81	3.67		1.09	1.36	24.9	1.53	17.5	-	-
2024 Safenlp	961	UNSAT	8.45	12.9		7.10	3.50	-	-	-	-	-
2024 Safenlp	962	UNSAT	7.85	3.64		1.09	1.40	24.7	-	15.7	-	-
2024 Safenlp	963	UNSAT	7.79	3.66		1.09	1.38	24.5	1.53	18.9	-	-
2024 Safenlp	964	UNSAT	8.03	3.59		X	1.38	-	1.52	-	-	-
2024 Safenlp	965	UNSAT	8.20	3.66		3.10	1.34	-	-	-	-	-
2024 Safenlp	966	UNSAT	8.32	-		X	8.89	-	-	16.7	-	-
2024 Safenlp	967	UNSAT	7.84	3.64		1.09	1.38	-	1.53	19.0	-	-
2024 Safenlp	968	UNSAT	8.38	-		X	5.77	-	-	-	-	-
2024 Safenlp	969	UNSAT	7.13	3.77		6.09	1.21	26.9	1.52	16.9	-	-
2024 Safenlp	970	UNSAT	7.68	3.67		1.09	1.34	25.6	-	19.6	-	-
2024 Safenlp	971	UNSAT	7.11	3.78		6.09	1.16	26.1	1.57	17.4	-	-
2024 Safenlp	972	UNSAT	8.73	-		7.10	7.09	-	-	-	-	-
2024 Safenlp	973	UNSAT	7.14	3.87		6.09	1.07	26.7	1.52	17.2	-	-
2024 Safenlp	974	UNSAT	8.20	-		3.10	2.03	-	-	-	-	-
2024 Safenlp	975	UNSAT	7.13	3.82		X	1.08	26.8	1.52	16.4	-	-
2024 Safenlp	976	UNSAT	8.19	3.69		X	1.25	-	-	-	-	-
2024 Safenlp	977	UNSAT	7.69	3.63		1.09	1.32	24.8	1.53	17.0	-	-
2024 Safenlp	978	UNSAT	7.12	3.81		6.09	1.13	26.5	1.51	19.9	-	-
2024 Safenlp	979	UNSAT	8.16	-		X	1.27	-	1.52	-	-	-
2024 Safenlp	980	UNSAT	7.70	3.62		X	1.36	-	1.53	17.2	-	-
2024 Safenlp	981	UNSAT	7.11	3.80		6.09	1.18	27.1	1.53	19.8	-	-
2024 Safenlp	982	UNSAT	7.15	3.80		7.10	1.19	26.2	1.53	18.9	-	-
2024 Safenlp	983	UNSAT	7.83	3.72		1.09	1.35	25.0	-	18.5	-	-
2024 Safenlp	984	UNSAT	8.33	5.76		6.09	2.19	-	-	17.8	-	-
2024 Safenlp	985	UNSAT	9.71	-		9.11	-	-	-	-	-	-
2024 Safenlp	986	UNSAT	7.13	3.81		X	1.10	27.2	1.52	17.1	-	-
2024 Safenlp	987	UNSAT	7.81	3.62		1.09	1.24	24.7	1.53	20.2	-	-
2024 Safenlp	988	UNSAT	7.11	3.82		19.2	1.08	27.2	1.52	18.1	-	-
2024 Safenlp	989	UNSAT	8.36	3.68		X	1.30	-	1.53	-	-	-
2024 Safenlp	990	UNSAT	7.69	3.63		1.09	1.41	25.2	1.53	17.0	-	-
2024 Safenlp	991	UNSAT	8.33	-		X	1.34	-	-	-	-	-
2024 Safenlp	992	UNSAT	9.15	-		X	-	-	-	-	-	-
2024 Safenlp	993	UNSAT	8.35	3.65		3.10	1.32	-	1.53	-	-	-
2024 Safenlp	994	UNSAT	8.51	15.9		6.09	3.39	-	-	-	-	-
2024 Safenlp	995	UNSAT	7.11	3.81		X	1.13	26.1	1.52	17.4	-	-
2024 Safenlp	996	UNSAT	7.12	3.79		6.09	1.11	26.3	1.51	18.2	-	-
2024 Safenlp	997	UNSAT	8.11	3.73		3.10	1.25	-	1.53	-	-	-
2024 Safenlp	998	UNSAT	8.20	3.70		3.10	1.25	-	1.52	-	-	-
2024 Safenlp	999	UNSAT	8.30	3.66		X	1.72	-	1.53	-	-	-
2024 Safenlp	1000	UNSAT	8.34	3.72		X	1.38	-	1.52	-	-	-
2024 Safenlp	1001	UNSAT	8.14	3.63		X	1.32	-	1.53	-	-	-
2024 Safenlp	1002	UNSAT	8.48	-		X	10.7	-	-	-	-	-
2024 Safenlp	1003	UNSAT	8.15	3.62		X	1.34	-	1.53	-	-	-
2024 Safenlp	1004	UNSAT	8.29	6.48		X	2.00	-	-	17.4	-	-
2024 Safenlp	1005	UNSAT	8.30	16.3		X	2.33	-	-	19.0	-	-
2024 Safenlp	1006	UNSAT	7.70	3.56		1.09	1.34	24.2	1.53	18.1	-	-
2024 Safenlp	1007	UNSAT	8.53	7.65		6.09	2.03	-	-	18.7	-	-
2024 Safenlp	1008	UNSAT	8.33	3.67		3.10	1.33	-	1.53	-	-	-
2024 Safenlp	1009	UNSAT	8.19	3.65		1.09	1.42	-	-	17.5	-	-
2024 Safenlp	1010	UNSAT	7.75	3.60		1.09	1.36	24.4	1.53	19.9	-	-
2024 Safenlp	1011	UNSAT	8.37	3.58		2.10	1.35	-	1.53	-	-	-
2024 Safenlp	1012	UNSAT	8.15	3.70		3.10	1.38	-	1.53	16.9	-	-
2024 Safenlp	1013	UNSAT	8.26	3.64		X	1.47	24.7	1.53	20.5	-	-
2024 Safenlp	1014	UNSAT	8.21	3.66		3.10	1.56	-	-	-	-	-
2024 Safenlp	1015	UNSAT	8.41	4.61		X	1.51	-	-	16.8	-	-
2024 Safenlp	1016	UNSAT	8.31	-		3.10	-	-	-	-	-	-
2024 Safenlp	1017	UNSAT	8.36	3.71		3.10	1.31	-	1.53	-	-	-
2024 Safenlp	1018	UNSAT	8.34	3.65		3.10	1.41	-	1.52	-	-	-
2024 Safenlp	1019	UNSAT	8.31	3.66		X	1.35	-	1.52	-	-	-
2024 Safenlp	1020	UNSAT	17.4	-		17.2	-	-	-	-	-	-
2024 Safenlp	1021	UNSAT	7.70	3.65		1.09	1.36	24.6	-	16.7	-	-
2024 Safenlp	1022	UNSAT	7.13	3.80		6.09	1.15	26.8	1.52	20.0	-	-
2024 Safenlp	1023	UNSAT	7.13	3.74		6.09	1.16	26.0	1.52	19.3	-	-
2024 Safenlp	1024	UNSAT	8.34	3.69		3.10	1.32	-	1.53	-	-	-
2024 Safenlp	1025	UNSAT	8.25	4.47		X	1.58	-	-	-	-	-
2024 Safenlp	1026	UNSAT	8.31	5.65		6.09	1.87	-	-	16.7	-	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Safenlp	1027	UNSAT	16.2	-	35.3	-	-	-	-	-
2024 Safenlp	1028	UNSAT	8.08	3.72	X	1.37	-	-	-	-
2024 Safenlp	1029	UNSAT	7.59	3.62	1.09	1.29	24.9	-	17.7	-
2024 Safenlp	1030	UNSAT	7.61	3.60	1.09	1.32	24.4	-	19.2	-
2024 Safenlp	1031	UNSAT	7.84	3.59	1.09	1.36	-	-	18.5	-
2024 Safenlp	1032	UNSAT	7.11	3.82	6.09	1.18	26.6	1.52	16.5	-
2024 Safenlp	1033	UNSAT	8.42	12.6	6.10	2.93	-	-	-	-
2024 Safenlp	1034	UNSAT	7.83	3.59	1.09	1.39	24.1	1.53	17.3	-
2024 Safenlp	1035	UNSAT	8.72	-	7.10	4.09	-	-	-	-
2024 Safenlp	1036	UNSAT	8.03	3.65	3.10	1.41	-	1.52	-	-
2024 Safenlp	1037	UNSAT	7.83	3.62	1.09	1.32	24.4	1.52	17.2	-
2024 Safenlp	1038	UNSAT	8.23	-	X	1.80	-	-	-	-
2024 Safenlp	1039	UNSAT	8.90	-	7.10	17.7	-	-	-	-
2024 Safenlp	1040	UNSAT	7.83	3.58	1.09	1.38	-	1.53	16.1	-
2024 Safenlp	1041	UNSAT	7.71	3.72	1.09	1.34	-	1.53	-	-
2024 Safenlp	1042	UNSAT	8.33	3.66	3.10	1.32	-	1.53	-	-
2024 Safenlp	1043	UNSAT	8.31	3.64	X	1.32	-	1.53	-	-
2024 Safenlp	1044	UNSAT	7.14	3.80	6.09	1.15	26.5	1.55	16.2	-
2024 Safenlp	1045	UNSAT	7.85	3.61	1.09	1.28	-	1.53	20.1	-
2024 Safenlp	1046	UNSAT	8.25	3.64	X	1.43	-	-	-	-
2024 Safenlp	1047	UNSAT	8.36	4.34	X	1.59	-	-	17.4	-
2024 Safenlp	1048	UNSAT	8.36	3.64	3.10	1.31	-	-	-	-
2024 Safenlp	1049	UNSAT	8.43	4.29	6.09	1.29	-	-	17.6	-
2024 Safenlp	1050	UNSAT	8.23	3.66	X	1.24	-	1.53	-	-
2024 Safenlp	1051	UNSAT	7.76	3.64	6.09	1.23	24.5	1.53	16.8	-
2024 Safenlp	1052	UNSAT	8.29	3.62	X	1.29	-	1.52	-	-
2024 Safenlp	1053	UNSAT	8.48	11.9	6.09	2.19	-	-	-	-
2024 Safenlp	1054	UNSAT	8.36	3.69	3.10	1.32	-	1.53	-	-
2024 Safenlp	1055	UNSAT	8.34	3.64	1.09	1.26	-	1.52	17.4	-
2024 Safenlp	1056	UNSAT	8.33	-	3.10	1.84	-	-	-	-
2024 Safenlp	1057	UNSAT	7.12	3.77	X	1.13	26.1	1.52	17.7	-
2024 Safenlp	1058	UNSAT	8.32	3.71	3.10	1.31	-	1.53	-	-
2024 Safenlp	1059	UNSAT	7.86	3.59	1.09	1.24	24.2	1.52	17.3	-
2024 Safenlp	1060	UNSAT	8.25	4.20	6.09	1.28	-	-	19.6	-
2024 Safenlp	1061	UNSAT	7.10	3.84	6.09	1.11	26.5	1.57	19.5	-
2024 Safenlp	1062	UNSAT	8.34	3.67	X	1.31	-	-	-	-
2024 Safenlp	1063	UNSAT	8.26	3.59	3.10	1.26	-	1.53	-	-
2024 Safenlp	1064	UNSAT	7.17	3.81	6.09	1.22	27.6	1.51	16.9	-
2024 Safenlp	1065	UNSAT	7.11	3.77	X	1.23	25.8	1.52	20.1	-
2024 Safenlp	1066	UNSAT	8.17	3.66	X	1.44	-	1.53	-	-
2024 Safenlp	1067	UNSAT	7.12	3.82	X	1.17	26.4	1.52	17.3	-
2024 Safenlp	1068	UNSAT	8.43	-	7.10	14.9	-	-	-	-
2024 Safenlp	1069	UNSAT	8.37	4.10	X	1.40	-	1.52	-	-
2024 Safenlp	1070	UNSAT	8.33	3.74	3.10	1.35	-	1.53	17.1	-
2024 Safenlp	1071	UNSAT	7.10	3.75	X	1.22	26.7	1.52	19.9	-
2024 Safenlp	1072	UNSAT	7.87	3.62	1.09	1.42	-	1.53	19.1	-
2024 Safenlp	1073	UNSAT	8.32	3.70	3.10	1.35	-	1.53	-	-
2024 Safenlp	1074	UNSAT	8.13	3.70	X	1.33	-	1.52	-	-
2024 Safenlp	1075	UNSAT	8.23	3.63	X	1.32	-	1.53	-	-
2024 Safenlp	1076	UNSAT	8.25	4.05	X	1.30	-	-	-	-
2024 Safenlp	1077	UNSAT	8.20	3.72	X	1.30	-	1.54	-	-
2024 Safenlp	1078	UNSAT	7.12	3.76	X	1.08	26.0	1.52	17.7	-
2024 Safenlp	1079	UNSAT	7.12	3.79	6.09	1.08	25.7	1.59	19.7	-
2024 Tinyimagenet	0	UNSAT	22.6	98.5	-	-	-	-	-	60.3
2024 Tinyimagenet	1	UNSAT	22.6	-	-	-	-	-	-	54.0
2024 Tinyimagenet	2	UNSAT	10.5	6.62	4.10	-	-	-	-	-
2024 Tinyimagenet	3	UNSAT	9.95	6.59	3.10	-	-	-	-	X
2024 Tinyimagenet	4	UNSAT	22.9	109	-	-	-	-	-	40.1
2024 Tinyimagenet	5	UNSAT	10.7	6.72	8.13	-	-	-	-	-
2024 Tinyimagenet	6	UNSAT	10.1	6.64	3.10	-	-	-	-	-
2024 Tinyimagenet	7	UNSAT	33.4	-	-	-	-	-	-	78.2
2024 Tinyimagenet	8	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	9	UNSAT	23.5	-	-	-	-	-	-	39.6
2024 Tinyimagenet	10	UNSAT	22.4	-	-	-	-	-	-	37.9
2024 Tinyimagenet	11	UNSAT	9.91	-	20.2	-	-	-	-	60.9
2024 Tinyimagenet	12	UNSAT	25.1	-	-	-	-	-	-	44.3
2024 Tinyimagenet	13	UNSAT	22.5	104	-	-	-	-	-	39.6
2024 Tinyimagenet	14	UNSAT	24.2	-	-	-	-	-	-	44.5

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Tinyimagenet	15	UNSAT	10.1	-	42.3	-	-	-	-	-
2024 Tinyimagenet	16	UNSAT	9.90	6.76	4.11	-	-	-	-	X
2024 Tinyimagenet	17	UNSAT	23.2	110	-	-	-	-	-	-
2024 Tinyimagenet	18	UNSAT	23.0	-	-	-	-	-	-	55.1
2024 Tinyimagenet	19	UNSAT	10.3	-	26.2	-	-	-	-	-
2024 Tinyimagenet	20	UNSAT	42.9	-	-	-	-	-	-	87.6
2024 Tinyimagenet	21	UNSAT	20.8	68.8	-	-	-	-	-	48.5
2024 Tinyimagenet	22	UNSAT	48.8	-	-	-	-	-	-	89.1
2024 Tinyimagenet	23	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	24	UNSAT	22.8	-	-	-	-	-	-	39.8
2024 Tinyimagenet	25	UNSAT	10.1	-	35.3	-	-	-	-	-
2024 Tinyimagenet	26	UNSAT	22.3	99.2	-	-	-	-	-	56.3
2024 Tinyimagenet	27	UNSAT	9.98	6.63	9.13	-	-	-	-	X
2024 Tinyimagenet	28	UNSAT	20.6	32.7	-	-	-	-	-	45.3
2024 Tinyimagenet	29	UNSAT	9.46	6.58	4.11	-	-	-	-	X
2024 Tinyimagenet	30	UNSAT	10.2	6.76	4.11	-	-	-	-	-
2024 Tinyimagenet	31	UNSAT	26.8	-	-	-	-	-	-	-
2024 Tinyimagenet	32	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	33	UNSAT	10.1	6.56	3.10	-	-	-	-	-
2024 Tinyimagenet	34	UNSAT	23.3	-	-	-	-	-	-	54.2
2024 Tinyimagenet	35	UNSAT	10.9	6.56	3.10	-	-	-	-	-
2024 Tinyimagenet	36	UNSAT	10.7	6.59	3.10	-	-	-	-	-
2024 Tinyimagenet	37	UNSAT	9.87	-	22.2	-	-	-	-	X
2024 Tinyimagenet	38	UNSAT	23.1	55.3	-	-	-	-	-	39.1
2024 Tinyimagenet	39	UNSAT	31.9	-	-	-	-	-	-	71.5
2024 Tinyimagenet	40	UNSAT	36.8	-	-	-	-	-	-	-
2024 Tinyimagenet	41	UNSAT	31.2	-	-	-	-	-	-	54.2
2024 Tinyimagenet	42	UNSAT	12.9	15.9	-	-	-	-	-	25.5
2024 Tinyimagenet	43	UNSAT	26.4	-	-	-	-	-	-	59.4
2024 Tinyimagenet	44	UNSAT	26.2	-	-	-	-	-	-	-
2024 Tinyimagenet	45	UNSAT	32.1	-	-	-	-	-	-	-
2024 Tinyimagenet	46	UNSAT	57.4	-	-	-	-	-	-	-
2024 Tinyimagenet	47	UNSAT	9.93	6.59	29.3	-	-	-	-	X
2024 Tinyimagenet	48	UNSAT	9.88	-	19.2	-	-	-	-	X
2024 Tinyimagenet	49	UNSAT	27.7	-	-	-	-	-	-	-
2024 Tinyimagenet	50	UNSAT	41.9	-	-	-	-	-	-	95.8
2024 Tinyimagenet	51	UNSAT	10.9	6.77	9.14	-	-	-	-	-
2024 Tinyimagenet	52	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	53	UNSAT	33.2	-	-	-	-	-	-	57.2
2024 Tinyimagenet	54	UNSAT	25.1	-	-	-	-	-	-	41.1
2024 Tinyimagenet	55	UNSAT	9.86	6.65	5.11	-	-	-	-	X
2024 Tinyimagenet	56	UNSAT	70.7	-	-	-	-	-	-	-
2024 Tinyimagenet	57	UNSAT	23.0	111	-	-	-	-	-	41.6
2024 Tinyimagenet	58	UNSAT	23.4	85.6	-	-	-	-	-	-
2024 Tinyimagenet	59	UNSAT	25.1	-	-	-	-	-	-	42.9
2024 Tinyimagenet	60	UNSAT	23.1	81.0	-	-	-	-	-	34.1
2024 Tinyimagenet	61	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	62	UNSAT	21.2	60.6	-	-	-	-	-	-
2024 Tinyimagenet	63	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	64	UNSAT	26.3	-	-	-	-	-	-	47.2
2024 Tinyimagenet	65	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	66	UNSAT	21.9	-	-	-	-	-	-	38.5
2024 Tinyimagenet	67	UNSAT	22.2	-	-	-	-	-	-	57.9
2024 Tinyimagenet	68	UNSAT	24.0	114	-	-	-	-	-	73.9
2024 Tinyimagenet	69	UNSAT	21.8	50.4	-	-	-	-	-	36.9
2024 Tinyimagenet	70	UNSAT	10.9	-	4.11	-	-	-	-	-
2024 Tinyimagenet	71	UNSAT	10.6	6.61	4.11	-	-	-	-	-
2024 Tinyimagenet	72	UNSAT	9.96	-	32.3	-	-	-	-	-
2024 Tinyimagenet	73	UNSAT	27.4	-	-	-	-	-	-	-
2024 Tinyimagenet	74	UNSAT	8.86	13.3	-	-	-	-	-	18.8
2024 Tinyimagenet	75	UNSAT	11.0	6.79	5.12	-	-	-	-	-
2024 Tinyimagenet	76	UNSAT	23.6	-	-	-	-	-	-	61.0
2024 Tinyimagenet	77	UNSAT	36.9	-	-	-	-	-	-	63.5
2024 Tinyimagenet	78	UNSAT	30.9	-	-	-	-	-	-	-
2024 Tinyimagenet	79	UNSAT	21.6	24.3	-	-	-	-	-	32.5
2024 Tinyimagenet	80	UNSAT	28.3	-	-	-	-	-	-	49.4
2024 Tinyimagenet	81	UNSAT	12.8	6.58	3.10	-	-	-	-	-
2024 Tinyimagenet	82	?	-	-	-	-	-	-	-	-

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Tinyimagenet	83	UNSAT	27.3	-	-	-	-	-	-	-
2024 Tinyimagenet	84	UNSAT	23.8	108	-	-	-	-	-	42.7
2024 Tinyimagenet	85	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	86	UNSAT	22.9	57.8	-	-	-	-	-	-
2024 Tinyimagenet	87	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	88	UNSAT	8.90	14.3	-	-	-	-	-	18.8
2024 Tinyimagenet	89	UNSAT	26.7	-	-	-	-	-	-	-
2024 Tinyimagenet	90	UNSAT	24.0	-	-	-	-	-	-	59.2
2024 Tinyimagenet	91	UNSAT	24.3	-	-	-	-	-	-	62.3
2024 Tinyimagenet	92	UNSAT	40.9	-	-	-	-	-	-	65.4
2024 Tinyimagenet	93	UNSAT	14.3	13.8	-	-	-	-	-	25.1
2024 Tinyimagenet	94	UNSAT	21.1	68.8	-	-	-	-	-	50.1
2024 Tinyimagenet	95	UNSAT	23.2	-	-	-	-	-	-	54.9
2024 Tinyimagenet	96	UNSAT	10.3	6.78	78.5	-	-	-	-	-
2024 Tinyimagenet	97	UNSAT	10.0	6.79	43.3	-	-	-	-	-
2024 Tinyimagenet	98	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	99	UNSAT	23.7	-	-	-	-	-	-	59.1
2024 Tinyimagenet	100	UNSAT	23.2	-	-	-	-	-	-	40.8
2024 Tinyimagenet	101	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	102	UNSAT	25.1	-	-	-	-	-	-	-
2024 Tinyimagenet	103	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	104	UNSAT	27.2	-	-	-	-	-	-	54.5
2024 Tinyimagenet	105	UNSAT	39.4	-	-	-	-	-	-	83.7
2024 Tinyimagenet	106	UNSAT	23.5	-	-	-	-	-	-	44.4
2024 Tinyimagenet	107	UNSAT	29.0	-	-	-	-	-	-	67.0
2024 Tinyimagenet	108	UNSAT	25.6	-	-	-	-	-	-	-
2024 Tinyimagenet	109	UNSAT	10.1	6.76	16.2	-	-	-	-	-
2024 Tinyimagenet	110	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	111	UNSAT	24.9	-	-	-	-	-	-	-
2024 Tinyimagenet	112	UNSAT	10.1	6.67	3.10	-	29.2	-	17.0	-
2024 Tinyimagenet	113	UNSAT	21.0	51.7	-	-	-	-	-	34.9
2024 Tinyimagenet	114	UNSAT	23.6	-	-	-	-	-	-	44.4
2024 Tinyimagenet	115	UNSAT	27.2	-	-	-	-	-	-	-
2024 Tinyimagenet	116	UNSAT	21.9	73.4	-	-	-	-	-	38.0
2024 Tinyimagenet	117	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	118	UNSAT	24.0	31.1	-	-	-	-	-	65.3
2024 Tinyimagenet	119	UNSAT	9.02	6.50	1.09	-	30.3	-	18.0	X
2024 Tinyimagenet	120	UNSAT	29.3	-	-	-	-	-	-	55.0
2024 Tinyimagenet	121	UNSAT	25.1	-	-	-	-	-	-	-
2024 Tinyimagenet	122	UNSAT	21.6	42.9	-	-	-	-	-	48.4
2024 Tinyimagenet	123	UNSAT	21.4	110	-	-	-	-	-	50.6
2024 Tinyimagenet	124	UNSAT	10.9	6.59	4.11	-	-	-	-	-
2024 Tinyimagenet	125	UNSAT	13.2	13.4	-	-	-	-	-	26.7
2024 Tinyimagenet	126	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	127	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	128	UNSAT	41.9	-	-	-	-	-	-	-
2024 Tinyimagenet	129	UNSAT	10.9	6.57	4.11	-	-	-	-	-
2024 Tinyimagenet	130	UNSAT	22.5	18.8	-	-	-	-	-	35.1
2024 Tinyimagenet	131	UNSAT	13.6	13.5	-	-	-	-	-	23.2
2024 Tinyimagenet	132	UNSAT	84.8	-	-	-	-	-	-	-
2024 Tinyimagenet	133	UNSAT	13.6	6.75	5.11	-	-	-	-	-
2024 Tinyimagenet	134	UNSAT	10.2	6.65	3.10	-	-	-	-	-
2024 Tinyimagenet	135	UNSAT	10.0	-	42.3	-	-	-	-	-
2024 Tinyimagenet	136	UNSAT	33.9	-	-	-	-	-	-	75.6
2024 Tinyimagenet	137	UNSAT	48.1	-	-	-	-	-	-	-
2024 Tinyimagenet	138	UNSAT	22.6	19.3	-	-	-	-	-	33.7
2024 Tinyimagenet	139	UNSAT	22.3	109	-	-	-	-	-	51.3
2024 Tinyimagenet	140	UNSAT	26.5	-	-	-	-	-	-	46.6
2024 Tinyimagenet	141	UNSAT	23.1	75.1	-	-	-	-	-	56.3
2024 Tinyimagenet	142	UNSAT	24.9	-	-	-	-	-	-	47.2
2024 Tinyimagenet	143	UNSAT	27.1	-	-	-	-	-	-	-
2024 Tinyimagenet	144	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	145	UNSAT	29.7	-	-	-	-	-	-	-
2024 Tinyimagenet	146	UNSAT	15.5	21.6	-	-	-	-	-	27.3
2024 Tinyimagenet	147	UNSAT	23.2	-	-	-	-	-	-	39.5
2024 Tinyimagenet	148	UNSAT	41.6	-	-	-	-	-	-	98.9
2024 Tinyimagenet	149	UNSAT	14.6	20.1	-	-	-	-	-	26.1
2024 Tinyimagenet	150	UNSAT	30.9	-	-	-	-	-	-	69.5

Table 29: Instance Runtimes. Fastest times are blue. Second fastest are green. Penalties are red crosses (X).

Category	Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Tinyimagenet	151	UNSAT	14.4	15.2	-	-	-	-	-	25.1
2024 Tinyimagenet	152	UNSAT	28.9	-	-	-	-	-	-	68.5
2024 Tinyimagenet	153	UNSAT	30.9	-	-	-	-	-	-	-
2024 Tinyimagenet	154	UNSAT	43.2	-	-	-	-	-	-	-
2024 Tinyimagenet	155	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	156	UNSAT	22.9	109	-	-	-	-	-	39.6
2024 Tinyimagenet	157	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	158	UNSAT	10.2	6.58	3.10	-	-	-	-	-
2024 Tinyimagenet	159	UNSAT	9.95	6.76	4.11	-	-	-	-	-
2024 Tinyimagenet	160	UNSAT	24.3	-	-	-	-	-	-	55.4
2024 Tinyimagenet	161	UNSAT	23.6	-	-	-	-	-	-	61.6
2024 Tinyimagenet	162	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	163	UNSAT	23.7	-	-	-	-	-	-	59.3
2024 Tinyimagenet	164	UNSAT	22.6	-	-	-	-	-	-	53.2
2024 Tinyimagenet	165	UNSAT	25.6	-	-	-	-	-	-	-
2024 Tinyimagenet	166	UNSAT	13.1	6.63	3.10	-	-	-	-	-
2024 Tinyimagenet	167	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	168	UNSAT	22.0	35.7	-	-	-	-	-	64.1
2024 Tinyimagenet	169	UNSAT	25.4	-	-	-	-	-	-	46.3
2024 Tinyimagenet	170	UNSAT	22.7	15.1	-	-	-	-	-	36.0
2024 Tinyimagenet	171	UNSAT	37.4	-	-	-	-	-	-	78.7
2024 Tinyimagenet	172	UNSAT	26.2	-	-	-	-	-	-	60.7
2024 Tinyimagenet	173	UNSAT	21.6	59.7	-	-	-	-	-	33.3
2024 Tinyimagenet	174	UNSAT	43.1	-	-	-	-	-	-	-
2024 Tinyimagenet	175	UNSAT	14.0	16.2	-	-	-	-	-	24.5
2024 Tinyimagenet	176	UNSAT	13.7	14.1	-	-	-	-	-	23.5
2024 Tinyimagenet	177	UNSAT	26.6	-	-	-	-	-	-	-
2024 Tinyimagenet	178	UNSAT	23.3	73.6	-	-	-	-	-	-
2024 Tinyimagenet	179	UNSAT	13.8	14.0	-	-	-	-	-	24.0
2024 Tinyimagenet	180	UNSAT	20.5	112	-	-	-	-	-	33.2
2024 Tinyimagenet	181	UNSAT	30.1	-	-	-	-	-	-	-
2024 Tinyimagenet	182	UNSAT	23.1	82.6	-	-	-	-	-	68.6
2024 Tinyimagenet	183	UNSAT	10.0	-	6.12	-	-	-	-	X
2024 Tinyimagenet	184	UNSAT	21.9	59.2	-	-	-	-	-	54.8
2024 Tinyimagenet	185	UNSAT	13.7	14.8	-	-	-	-	-	23.5
2024 Tinyimagenet	186	UNSAT	10.0	-	77.5	-	-	-	-	-
2024 Tinyimagenet	187	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	188	UNSAT	9.96	6.67	4.11	-	-	-	-	-
2024 Tinyimagenet	189	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	190	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	191	UNSAT	31.9	-	-	-	-	-	-	-
2024 Tinyimagenet	192	?	-	-	-	-	-	-	-	-
2024 Tinyimagenet	193	UNSAT	9.96	-	19.2	-	-	-	-	X
2024 Tinyimagenet	194	UNSAT	10.3	6.71	10.1	-	-	-	-	-
2024 Tinyimagenet	195	UNSAT	35.9	-	-	-	-	-	-	-
2024 Tinyimagenet	196	UNSAT	24.7	-	-	-	-	-	-	-
2024 Tinyimagenet	197	UNSAT	23.8	-	-	-	-	-	-	-
2024 Tinyimagenet	198	UNSAT	30.9	-	-	-	-	-	-	-
2024 Tinyimagenet	199	UNSAT	32.8	-	-	-	-	-	-	67.7
2024 Tllverifybench	2023 0	UNSAT	6.99	8.70	1.09	1.20	25.8	2.06	11.0	X
2024 Tllverifybench	2023 1	UNSAT	8.71	12.4	7.10	-	-	1.58	11.7	4.27
2024 Tllverifybench	2023 2	UNSAT	8.06	8.47	6.10	1.85	-	1.57	11.2	4.25
2024 Tllverifybench	2023 3	UNSAT	8.03	19.0	7.10	2.63	-	1.57	11.2	4.26
2024 Tllverifybench	2023 4	UNSAT	8.23	43.5	29.2	-	-	2.02	11.4	4.55
2024 Tllverifybench	2023 5	UNSAT	6.98	6.88	1.09	1.20	27.0	1.99	10.7	X
2024 Tllverifybench	2023 6	UNSAT	8.13	11.9	9.11	-	-	2.03	11.3	4.49
2024 Tllverifybench	2023 7	UNSAT	6.98	6.80	1.11	1.22	25.9	1.72	10.7	X
2024 Tllverifybench	2023 8	UNSAT	7.01	6.95	1.09	2.00	26.4	2.85	10.9	X
2024 Tllverifybench	2023 9	UNSAT	7.02	6.93	1.09	1.90	28.0	3.76	10.9	X
2024 Tllverifybench	2023 10	UNSAT	6.99	6.99	1.10	1.43	27.2	2.82	10.9	X
2024 Tllverifybench	2023 11	UNSAT	8.50	30.3	24.2	-	-	3.77	11.5	4.91
2024 Tllverifybench	2023 12	UNSAT	7.37	15.2	1.10	-	27.1	9.04	11.0	X
2024 Tllverifybench	2023 13	UNSAT	7.03	7.26	1.09	1.84	27.9	8.98	11.2	X
2024 Tllverifybench	2023 14	UNSAT	8.52	73.6	135	-	-	9.13	12.5	4.97
2024 Tllverifybench	2023 15	UNSAT	8.57	76.4	150	-	-	9.07	12.8	5.09
2024 Tllverifybench	2023 16	UNSAT	8.82	36.9	104	-	-	26.2	14.2	5.80
2024 Tllverifybench	2023 17	UNSAT	9.28	151	432	-	-	26.7	21.3	7.14
2024 Tllverifybench	2023 18	UNSAT	9.39	113	402	-	-	26.6	20.4	6.91

Table 29: Instance Runtimes. Fastest times are [blue](#). Second fastest are [green](#). Penalties are red crosses ([X](#)).

Category		Id	Result	$\alpha$ - $\beta$ -C	PyRAT	Marab	NNen	NNV	NeVer2	CORA	NSAT
2024 Tllverifybench 2023	19	UNSAT	7.17	8.31	1.09	3.36	27.5	23.3	11.2	<a href="#">X</a>	
2024 Tllverifybench 2023	20	UNSAT	7.46	10.6	1.09	6.16	27.4	63.0	11.5	<a href="#">X</a>	
2024 Tllverifybench 2023	21	UNSAT	7.44	13.4	1.09	6.23	27.6	67.5	12.7	<a href="#">X</a>	
2024 Tllverifybench 2023	22	UNSAT	10.0	119	548	-	-	67.1	27.5	8.14	
2024 Tllverifybench 2023	23	UNSAT	7.47	13.2	1.09	9.85	27.6	62.8	11.4	<a href="#">X</a>	
2024 Tllverifybench 2023	24	UNSAT	9.07	178	1.09	16.7	28.3	147	14.5	<a href="#">X</a>	
2024 Tllverifybench 2023	25	UNSAT	10.4	76.5	528	-	-	149	37.7	9.20	
2024 Tllverifybench 2023	26	UNSAT	11.3	314	-	-	-	149	50.6	11.6	
2024 Tllverifybench 2023	27	UNSAT	7.84	14.0	1.09	11.5	29.0	142	12.4	<a href="#">X</a>	
2024 Tllverifybench 2023	28	UNSAT	8.40	19.8	2.10	22.4	28.2	415	13.4	<a href="#">X</a>	
2024 Tllverifybench 2023	29	UNSAT	11.7	348	-	-	-	415	64.4	13.6	
2024 Tllverifybench 2023	30	UNSAT	8.43	22.9	2.10	21.7	30.3	416	13.9	<a href="#">X</a>	
2024 Tllverifybench 2023	31	UNSAT	8.44	21.6	2.10	27.2	28.4	409	13.0	<a href="#">X</a>	