

# Milestone 3

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## 1. Usage

- a. to compile:  
make
- b. to test some cnf file:  
./yasat <filename.cnf>
- c. **to test all the following benchmarks**  
**./test\_all**
- d. to test benchmark in milestone 2  
./test\_benchmarks
- e. to test 1\_easy benchmark  
./test\_easy
- f. to test 2\_medium benchmark  
./test\_medium
- g. to test 3\_hard benchmark  
./test\_hard

## 2. Features

- a. VSIDS score strategy with integer type, score decaying
- b. BCP with two literal watching
- c. Conflict Driven Clause Learning with Non-chronological backtracking
- d. Random Restart
- e. Random Parallel Clause Learning
  - Random Branch
  - Random Resolution Stage
  - Random Backtracking
  - Simulated Annealing

## 3. Summary

- a. Parameters for Randomness Really Matters
- b. Size of Clause database really hurts the Speed, may need to add some clause evaluation method to determine whether add the learnt clause or not. I think this could help improve the performance because some papers presented by other classmates show better Results when they applied some strategies to the learnt clauses.
- c. The following table are the test time in seconds for some benchmarks. Timelimit is set to be 15 minutes. Blank means the execution time exceeds the timelimit. The sudoku benchmarks are from milestone 1.

for_milestone_2		easy		medium		hard		sudoku	
aim-100-1_6-no-1	0.00675	aim-50-1_6-no-1	0.001295	aim-100-1_6-no-1	0.005147	ii16a1	0.051553	sudoku/9	0.001696
aim-100-1_6-yes1-1	0.022637	aim-50-1_6-no-2	0.001026	aim-100-1_6-no-2	0.003303	ii16a2	3.477528	sudoku/16	0.058267
aim-200-1_6-no-1	0.008765	aim-50-1_6-no-3	0.001347	aim-100-1_6-no-3	0.004445	ii16b1	22.428543	sudoku/25	
aim-200-1_6-yes1-1	0.122907	aim-50-1_6-no-4	0.001328	aim-100-1_6-no-4	0.005896	ii16b2			
aim-50-1_6-no-1	0.001228	aim-50-1_6-yes1-1	0.004215	aim-100-1_6-yes1-1	0.016208	ii32b1	0.00335		
aim-50-1_6-yes1-1	0.009773	aim-50-1_6-yes1-2	0.01053	aim-100-1_6-yes1-2	0.028229	ii32b2	4.623845		
dubois100	61.752933	aim-50-1_6-yes1-3	0.009279	aim-100-1_6-yes1-3	0.01381	ii32b3	330.624922		
dubois20	0.315506	aim-50-1_6-yes1-4	0.004995	aim-100-1_6-yes1-4	0.015524	ii32b4			
ii16a1	0.054402	dubois26	0.571243	aim-200-1_6-no-1	0.010278	par16-1-c			
ii32a1		dubois27	0.443268	aim-200-1_6-no-2	0.005882	par16-2-c			
ii8a1	0.000652	dubois28	0.554833	aim-200-1_6-no-3	0.009021	par16-3-c			
jnh10	0.028073	dubois29	0.714017	aim-200-1_6-no-4	0.01339	par16-4-c			
jnh11	0.076771	hole6		aim-200-1_6-yes1-1	0.082561	par32-1-c			
jnh1	0.242374	hole7		aim-200-1_6-yes1-2	0.107637	par32-2-c			
par16-1-c		hole8		aim-200-1_6-yes1-3	0.110081	par32-3-c			
par16-1		hole9		aim-200-1_6-yes1-4	0.18516	par32-4-c			
par32-1-c		ii8a1	0.000513	jnh201	0.101359				
par32-1		ii8a2	0.001266	jnh210	0.029927				
par8-1-c	0.02044	ii8a3	0.001326	jnh301	0.394743				
par8-1	3.212436	ii8a4	0.005612	jnh310	0.003884				
		par8-1-c	0.032101						
		par8-2-c	0.023081						
		par8-3-c	0.065533						
		par8-4-c	0.015096						