Homework Assignment 7
Total Points: 100

Professor Karem A. Sakallah

EECS 598-002: Formal Verification of Hardware & Software Systems

Assigned: March 26, 2024
Due: April 2, 2024

Guidelines

- The College of Engineering Honor Code applies to all work in this course.
- The due date is firm. Follow submission instructions (at the end).

Objectives

This assignment involves the use of the marco MUS enumerator. For each of the 10 zipped UNSAT CNF files below, run marco to generate all of its MUSes. For each benchmarks, record the number of variables and clauses, the number of MUSes and marco's run time in seconds.

Benchmark	#Variables	#Clauses	#MUSes	RunTime, s
barrel2.cnf.gz				
C168_FW_UT_851.cnf.gz				
C208_FA_UT_3254.cnf.gz				
c2670.cnf.gz				
dlx2_aa.cnf.gz				
edn_5371_4.cnf_0.21000000.unsat.cnf.gz				
fpu2-problem.dimacs_16.filtered.cnf.gz				
longmult0.cnf.gz				
minand016.cnf.gz				
ssa2670-140.cnf.gz				

Marco can be run from the Unix command line by typing `$ marco filename.cnf.` It can also read the zipped CNF files directly. The `-h` command line option displays short explanations for all available options. Figure 1 shows a sample run of marco.

```
c test.cnf
p cnf 2 5
1 0
-1 0
2 0
-2 0
1 2 0

(/afs/umich.edu/class/eecs598a/w23/env27) bash-4.4\$ marco --cnf -s test.cnf
U
U
S
U
S
S
S
check  :    0.000
seed   :    0.000
block  :    0.001
setup  :    0.005
shrink :    0.017
total  :    0.048
block count  :        7
block per    :  0.00008
check count  :        7
check per    :  0.00004
seed count   :        8
seed per     :  0.00005
setup count  :        1
setup per    :  0.00523
shrink count :        3
shrink per   :  0.00560
delta.checkA.down min : 0.000000
delta.checkA.down max : 0.600000
delta.checkA.down avg : 0.333333
delta.checkA.up min   : 0.000000
delta.checkA.up max   : 0.000000
delta.checkA.up avg   : 0.000000
delta.shrink.down min : 0.000000
delta.shrink.down max : 0.000000
delta.shrink.down avg : 0.000000
```

Figure 1: Sample run of marco

Submission Instructions

Organize the data from running marco according to the tabular format above. Use a text editor to generate a PDF file named <your uniquname>_hw7.pdf and upload the file to Canvas.