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CSCE686 - Dr. Lamont

Spr 2020 - Homework 3

**Exercise 1.4 Size of an instance versus its structure.** The size of an instance

is not the unique indicator that describes the difficulty of a problem, but also its

structure. For a given problem, small instances cannot be solved to optimality while

large instances may be solved exactly. Showfor some classical optimization problems

(e.g., satisfiability, knapsack, bin packing, vehicle routing, and set covering) that

some small instances are not solved exactly while some large instances are solved to optimality by the state-of-the-art exact optimization methods.

MIS AND CLIQUE PROBLEMS ONLY

1. – Time complexity of graphplan for MIS w/ different sized graphs

* Pics of a graph or two
* Measures – time vs #nodes / #edges / graphcompleteness?
* Reporting – plot of above measures

• **Experimental design:** In the first step, the goals of the experiments, the selected

instances, and factors have to be defined.

• **Measurement:** In the second step, the measures to compute are selected. After

executing the different experiments, statistical analysis is applied to the obtained

results. The performance analysis must be done with state-of-the-art optimization

algorithms dedicated to the problem.

• **Reporting:** Finally, the results are presented in a comprehensive way, and an

analysis is carried out following the defined goals. Another main issue here is to

ensure the *reproducibility* of the computational experiments.