CSE 235H SAT Homework 02 Spring 2019

Due: Monday, February 4, 2019 Written by Daniel Geschwender

Name 1 (Print) _____ **CSE Login** _____

Name 2 (Print) _____ **CSE Login** _____

Problem	Page	Points	Score
A	-	6	
B	-	10	
Typesetting (bonus)		2	
Total		16	

Instructions Follow instructions *carefully*, failure to do so may result in points being deducted.

- This homework is one of the 'honors' component of this course. It should not take more than two (2) hours to complete. If it does, please let us know.
- The homework must be submitted on paper. Homework *neatly* formatted in LaTeXwill receive a 10 percent bonus. When formatting in LaTeX, submit both the .tex and .pdf files via handin, in addition to the hard copy. You will not receive the bonus points if you work with a partner (see below).
- Clearly label each problem and submit answers *in order*.
- Staple this cover page to the front of your assignment for easier grading.
- Late submissions will *not* be accepted.
- When you are asked to prove something, you must give a formal, rigorous, and complete a proof as possible. Each step in your proof must contain explanation that would allow us to understand what theorem/logic you have applied to arrive at that step.
- You are to work individually and all work should be your own. Check partner policy below.
- The CSE academic dishonesty policy is in effect (see `http://cse.unl.edu/ugrad/resources/academic_integrity.php`).

Partner Policy You may work in pairs as long as follow the guidelines below:

1. You must work *all* problems *together*. You may not simply partition the work between you.
2. You must use LaTeXand you may divide the typing duties however you wish.
3. You may not discuss the problems with other groups or individuals.
4. Hand in only one hard copy with both authors' names.

Problem A: Write a CNF formula to model the following scenario:

1. There are four choices of desserts: ice cream, fruit bowl, cake, pie.
2. Exactly one dessert must be selected (i.e., one and only one).

Proceed following the four steps below:

1. First state the propositions and what they represent.
2. State the sentence.
3. Explain the meaning of the clauses.
4. Is the sentence satisfiable? Explain why or why not.

Problem B: Write a CNF formula to model the following scenario:

1. The four states (NE, IA, KS, MO) on the map shown in Figure 1 must be colored using three colors: red, green, and blue.

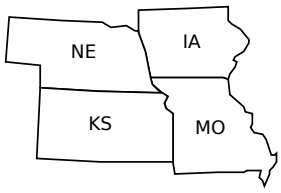

Figure 1: Four states (NE, IA, KS, MO)

2. Each state must be colored with exactly one color.
3. Adjacent states (i.e., states sharing a border line) cannot have the same color.

Proceed following the four steps of Problem A.