CS 270 Lab 5 (Boolean Expressions and a Tautology Checker)

Week 5 - Oct. 23 – Oct. 27, 2017.

Name 1:_____

Drexel Username 1:_____

Name 2:_____

Drexel Username 2:_____

Name 3:_____

Drexel Username 3:_____

Grading:

Part 1 (25pts) _____

Part 2 (25pts) _____

Part 3 (25pts) _____

Part 4 (25pts) _____

Instructions: For this exercise you are encouraged to work in groups of two or three so that you can discuss the problems, help each other when you get stuck and check your partners work. In this lab students will implement a Racket program to check to see if a Boolean expression is a tautology. I.E. whether all assignments of the variables occurring in the expression evaluate to true. The file lab5.rkt contains a complete description, along with helper functions that you may use and hints on how to solve each part.

This will be accomplished by the following steps:

1) Part 2. Determine the variables occurring in the Boolean expression.

2) Part 3. Construct all possible assignments for the variables in (1). Each possible assignment will be stored in an environment, which is a list of bindings.

3) Part 4. Evaluate the boolean expression for each environment constructed in (2) and check to see that the expression is true for all of the environments. The list of environments along with the corresponding boolean values is a truth table for the given boolean expression.

In Part 1 students will study and make a small modification to the boolean evaluation function provided in lecture which is provided below.