**CS 3173 Assignment 5 14 points**

**chapter 8**

**Due 9/30**

**Email your homework to me at** [**harringp@nsuok.edu**](mailto:harringp@nsuok.edu)

**Part 1: Problem Solving: Type your answers (8 points):**

1. What is an adder? – **A circuit used to add binary numbers.**
2. What is a seven segment display? – **An array of seven line segments that can be individually turned on or off to display numbers, most commonly used to make a digital clock.**
3. How many bits per segment are needed for input? – **4 bits per segment.**
4. What is an active low circuit? – **A circuit is disabled when power is being sent to it, and it is active when there is no power being sent to it. The signal is ‘low’ and the circuit is active.**
5. What is a decoder? – **A circuit that takes an input of n bits and outputs 2n bits.**
6. What is a multiplexer? – **A circuit that routes multiple inputs to a single output. Selection lines are used to choose which data input is transmitted to the data output.**
7. What is a demultiplexer? – **The opposite of a multiplexer; it takes a single input and routes it to multiple outputs.**
8. What is an integrated circuit? – **A small chip with all of the logic gates required for circuits integrated inside of it, with pins on the outside for input and output.**

**Part 2: Java Programming (6 points):**

Write a Java program to create the full-adder on page 146 of the course textbook PDF. It is also shown below: carryout and sum equations:

use the Boolean data type for A and B and C. Be sure to get input from the user.

In the above, use ! to represent negation , || to represent + (OR), && to represent multiplication (AND) in the above equation.