LAB Assignment #4 for CMPE 312L

Description: Investigating XOR gates.
Total 200 points.

Problem 1 (70 points): Parity Generation: Design a four-bit even parity generator that uses exclusive-OR circuits. This circuit should have four inputs and an output that is HIGH only when an odd number of inputs are HIGH.

Problem 2 (30 points): Controlled inverters: The circuit should have four inputs and one control input. The output of the circuit should be same as the input if the control input is zero. The output should be the inverse of the input if the control input is 1.

Problem 3 (100 points): Binary comparator: Design a 3-bit relative magnitude detector that determines if two numbers are equal and, if not, which number is larger. The circuit has three outputs as follows:
1. M = 1 only if the two input numbers are equal.
2. N = 1 only if \( X_2X_1X_0 \) is greater than \( Y_2Y_1Y_0 \).
3. P = 1 only if \( Y_2Y_1Y_0 \) is greater than \( X_2X_1X_0 \).
   where \( X_2X_1X_0 \) and \( Y_2Y_1Y_0 \) are the two 3-bit inputs.

Show your outputs to the instructor or the TA.

Revise Flip-flops and latches for the next lab.

THE LABS ARE INDIVIDUAL EFFORTS. INSTANCES OF CHEATING WILL RESULT IN YOU FAILING THE COURSE.S