CS 371
Assignment #4
Digital Design
Due 2/28/20, in class

1. Goal
The goal of this assignment is to build some “real(TM)” circuits.

2. Breadboard work — to be done in pairs
The following are to be done on the breadboards and demonstrated in well narrated videos.

   (1) Wire up the following circuit and check the truth table. Use only two chips, a 7408 and a 7486.
       \[ F(A, B, C, D) = \sum(5, 6, 9, 10) \]

   (2) Build a circuit which generates a parity bit which is 1 if the number of 1’s in a 4 bit word is odd and
       0 if the number of 1’s in the word is even (even parity). Check the truth table. Use a single 7486
       chip.

   (3) Build a 2-input XOR circuit (gate) out of four 2-input NAND gates. Prove it is an XOR by showing
       that the two truth table columns are the same.

3. Book Problems — to be done individually
Do Problems 15ac, 16ac, and 24ac from Chapter 2 (Pages 105-106) as well as Problems 1 and 2 from
Chapter 3 (Page 184) of Mano and Kime 5th ed.

4. What to hand in
   (1) Hand in a paper copy of your individual book work.
   (2) Upload to moodle the three videos each named with both partner’s names. Both partners don’t
       need to upload the same video :)

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