Lab 6
NAND / NOR Implementation

Lab report due before your lab period on October 12 or 14

- For this lab, only use the 74HC00 and 74HC02 ICs to implement your logic, the bar LEDs as outputs, and the switches as inputs
- Find the minimal SOP expression of f using a Karnaugh map (you may draw the groups)

$$f(a,b,c,d) = \sum m(0,2,8,10,12,13,14,15)$$

- Convert the minimal SOP expression of f to use only two-input NAND gates using Boolean algebra
- Implement f using only NAND (74HC00) gates and demonstrate it to your lab TA
- Find the minimal representation of f using only two-input NOR gates (you may draw the groups on any Karnaugh map used)
  - Describe how you found the representation
  - Provide the final boolean expression using only two-input NOR gates
- Implement f using only NOR (74HC02) gates and demonstrate it to your lab TA
- Verify your two implementations of f yield the same outputs by using a truth table

The report for this lab should include the following sections:

1. Description/Objectives
2. Procedure, which must include
   (a) The Karnaugh maps you used to minimize any expressions
   (b) The boolean algebra to convert to only NAND/NOR
   (c) The truth table you used to test your implementations
3. Observations
4. Conclusions