Homework #1 ECE 461 / 661

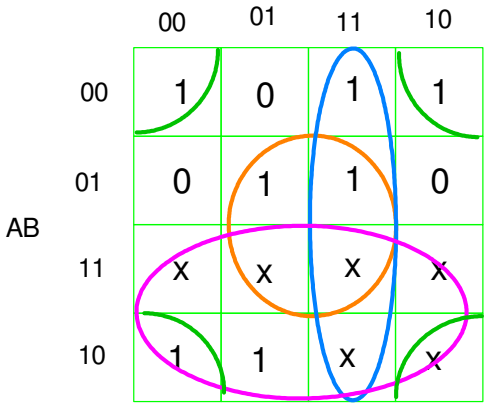
Ladder Logic. Due Monday, August 31st

(will accept any time before December 1st so you can use the Micro810 PLC's)

Note: For this assignment, you may use

- Allen Bradley Micro810 PLCs (ECE room 211 or check one out), or
- PLC Fiddle (https://www.plcfiddle.com/)

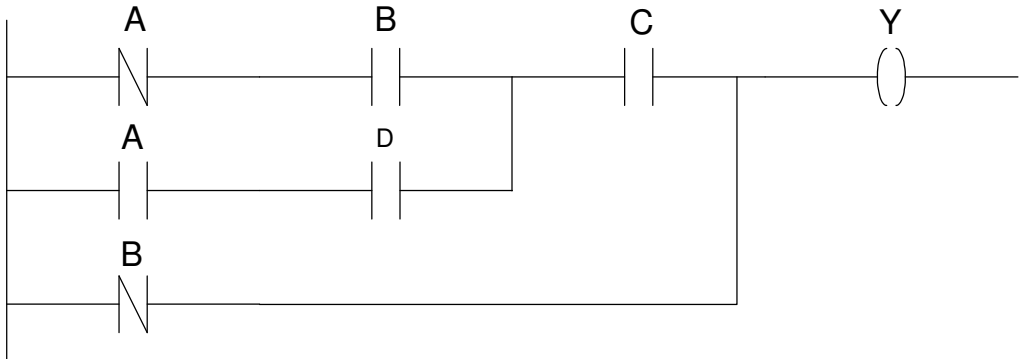
1) Write a Ladder Logic program to implement the following logic function: Y = f(A,B,C,D)



$$Y = A + BD + CD + B'D'$$

Using PLC Fiddle:

2) Determine the logic function which corresponds to the following ladder logic program:



$$Y = B' + C(A'B + AD)$$

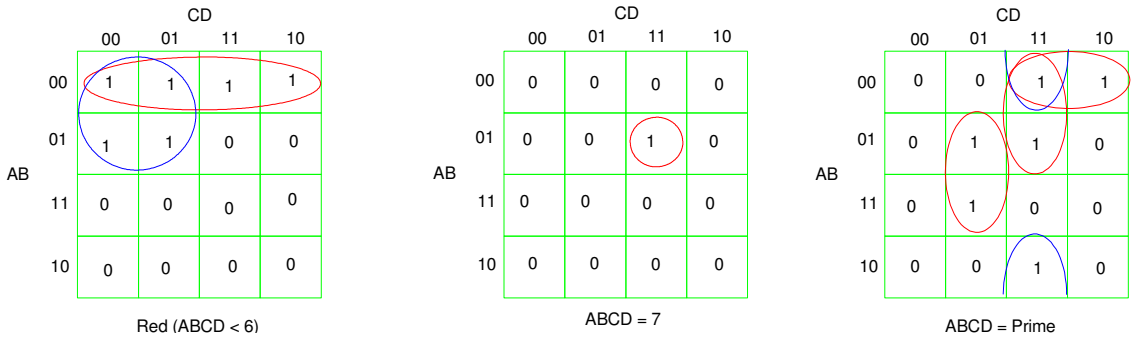
3) Write a ladder logic program to meet the following requirements:

I/O:

- Input: Button 1, 2, 3, 4 (binary number from 0000 to 1111 with the MSB being button 1)
- Output: 1 (red), 2 (yellow), and 3 (green)

How they relate:

- The red light turns on if the binary number is less than 6 {0, 1, 2, 3, 4, 5}
- Theyellow light turns on if the binary number is equal to 7 {7 }
- The green light turns on if the binary number is prime { 2, 3, 5, 7, 11, 13 }



$$Red = A'C' + A'B'$$

$$Yellow = A'BCD$$

$$Green = BC'D + A'CD + B'CD + A'B'C$$