

# Homework #1 ECE 461 / 661

Ladder Logic. Due Monday, August 30th

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

Note: For this assignment, you may use

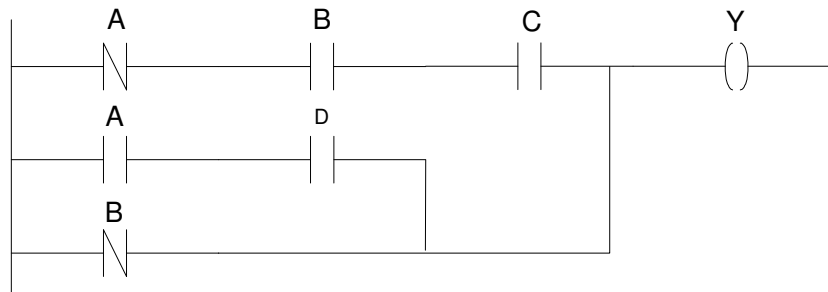
- Allen Bradley Micro810 PLCs ( ECE room 211 or check one out ), or
- PLC Fiddle ( <https://www.plcfiddle.com/> )

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

- $Y = 1$  if ABCD is a prime number,
- $Y = 0$  otherwise

		CD			
		00	01	11	10
AB	00	0	1	1	1
	01	0	1	1	0
	11	0	1	0	0
	10	0	0	1	0

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



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 a multiple of 3 {0, 3, 6, 9, 12, 15}
- The yellow light turns on if the binary number is a multiple of 5 {0, 5, 10, 15}
- The green light turns on if the binary number is a multiple of 3 and 5 { 0, 15 }