

# Homework #1 ECE 461 / 661

Ladder Logic. Due Monday, August 29th

(will accept any time before December 5th so you can use the Micro810 PLC's)

Note: For this assignment, you may use

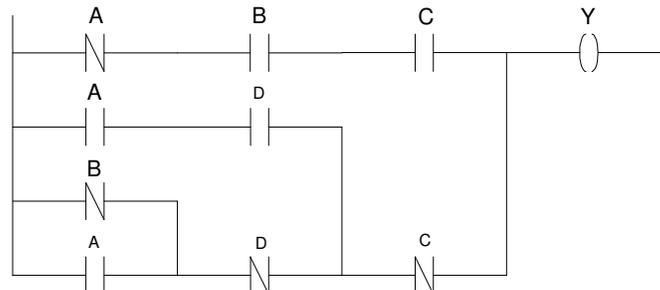
- Allen Bradley Micro810 PLCs ( ECE room 211 or check one out ), or
- PLC Fiddle ( <https://www.plcfiddle.com/> )

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

- $Y = 1$  if ABCD is a multiple of 5 or 7,
- $Y = 0$  otherwise

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

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 one button is pressed { 1, 2, 4, 8 }
- The yellow light turns on if two buttons are pressed { 3, 5, 6, 9, 10, 12, 14 }
- The green light turns on if three buttons are pressed { 7, 11, 13 }