

Homework #1 ECE 461 / 661

Ladder Logic. Due Monday, August 29th

(will accept any time before December 8th so you can use the Micro810 PLC's)

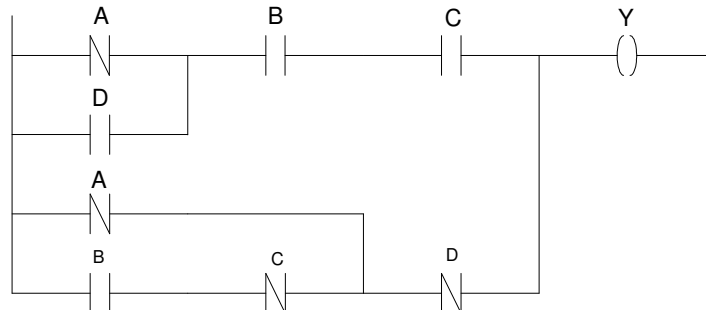
Note: For this assignment, you may use

- 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: $Y = f(A,B,C,D)$

| | | CD | | | |
|----|----|----|----|----|----|
| | | 00 | 01 | 11 | 10 |
| AB | 00 | 1 | 0 | 0 | 0 |
| | 01 | 1 | 0 | 1 | 0 |
| | 11 | 1 | x | 1 | 0 |
| | 10 | 0 | x | 1 | 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 the binary value is a multiple of three {0, 3, 6, 9, 12, 15}
- The yellow light turns on if the binary value is a multiple of four {0, 4, 8, 12}
- The green light turns on if the binary value is a multiple of five { 0, 5, 10, 15 }