

ECE 461 / 661 - Test #1

Due Monday, September 21st (Take Home) - You may work in groups of 1 - 3. One test per group.

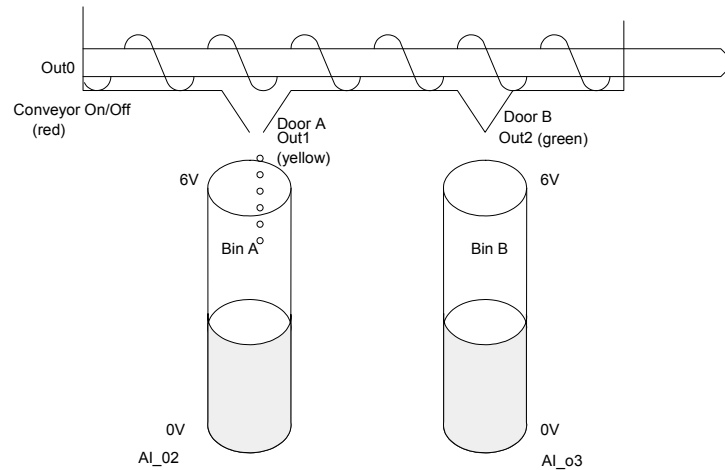
1) Write a ladder-logic program which outputs

- DO_00 on (red) if an odd number of buttons are pressed (button 0..5)
- DO_01 on (yellow) if an even number of buttons are pressed (button 0..5)

Please turn in

- Your work for obtaining the logic functions,
- Resulting ladder logic program
- Test results to verify your program works correctly.

2) Two grain bins are to be filled using a PLC. To keep the bins balanced, you are to alternate between filling each bin.



Write a ladder-logic program to implement the following function

Input: (note: the two potentiometers simulate grain filling up the bins)

- DI_00: Start button.
- AI_02: Bin A 0V = empty, 6V = full
- AI_03: Bin B 0V = empty, 6V = full

Output:

- DO_00: Conveyor belt on
- DO_01: Door to bin A is open (A is filling)
- DO_02: Door to bin B is open (B is filling)
- DO_03: Both bins full

Requirements

- On power up, the conveyor belt is off and both doors closed.
- When you hit the start button, the conveyor belt turns on and door A opens.

- When the level in bin A is 1V (100 A/D counts) more than B, door A closes and door B opens. You start filling bin B.
- When the level in bin B is 1V (100 A/D counts) more than A, door B closes and door A opens. You start filling bin A.
- When bin A or B reaches 6V or more, the door remains closed.
- When both bins reach 6V or more, the conveyor turns off and the full light turns on (DO_03 Blue)

Write-Up:

- Explain your logic for your ladder-logic program
- Test your program: does it meet each requirement
- Demonstrate: Show your program works in person or with a video

