# Test #1: ECE 461 / 661

PLC Programming.: Due Monday, September 19th

Note: This is a midterm so please work alone or in groups of 2. If you work in a group of 2, please turn in one solution with both of your names on your solution. If another student needs help with something basic, like getting the PLC to communicate with the PC, feel free to help. If another student needs help doing the test, please ask them to see the instructor (Jake Glower).
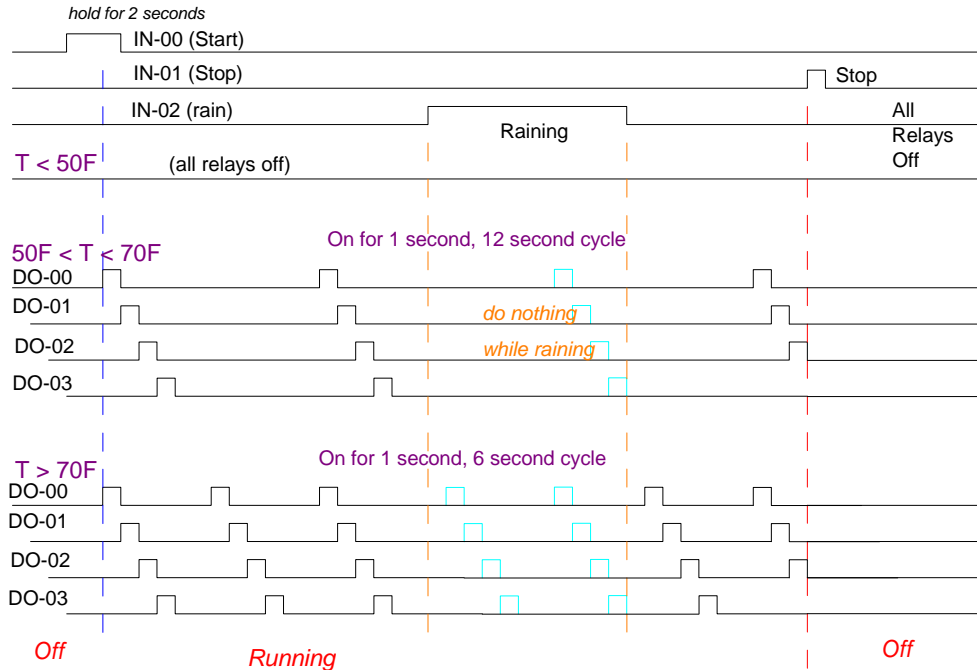


Write a PLC program (ladder diagram or structured text) to implement an irrigation system:

**Input:**
- AI03: Temperature 0F (0000) to 100F (1000)
- DI-00: On. Turn on the irrigation system. Button must be held for 2 seconds to turn on.
- DI-01: Stop: Turn off immediately (no delay) and it remains off until turned on
- DI-02: Rain Sensor. It's raining if the button is pressed.

**Output:** Four relays which control four separate sprinklers - only one of which should be on at any time.

**Function:**

When off or its raining, all sprinklers are turned off (relay = off)

When on and it's not raining
- If the temperature is less than 50F, all sprinklers are turned off.
- If the temperature is between 50F and 70F (A/D reads 500 to 700), turn on the sprinklers sequentially for one second every 12 seconds.
- If the temperature is above 70F (A/D reads 701 or more), turn on the sprinklers sequentially for one second every 6 seconds.

At any time, hitting Stop (DI-01) will turn off all relays immediately (safety kill switch).