PLC Ladder Programming Course

Task 1

Requirements: 1. We would to fill tank to level by pump 1 and pump 2

2. After this will have to operate mixer to mix two fluids together
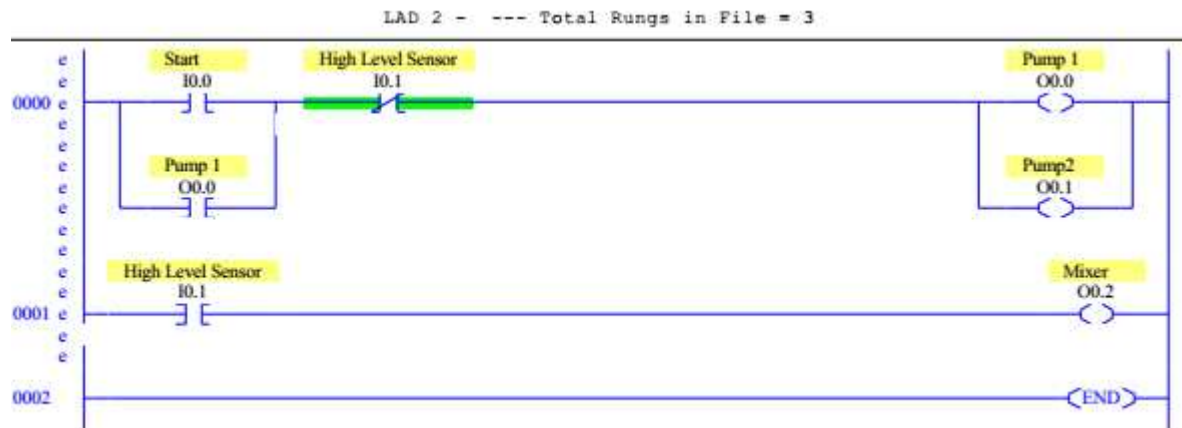
PLC Ladder Logic

Step 1: With the help of start button we have to start both pumps

Step 2: latching of output to keep that pumps operating

Step 3: when fluid reaches high level then system will be turn (NC contact in series with first two steps)

Step 4: as high level become 'Logic 1' then Mixer will be start.

Ladder Diagram

PLC Ladder Programming Course

Task 2

Requirements: 1. Fill the tank using pump 1

2. After filling tank pump 3 will start emptying the tank

PLC Ladder Logic

Step 1: Start & stop button given to pump 1

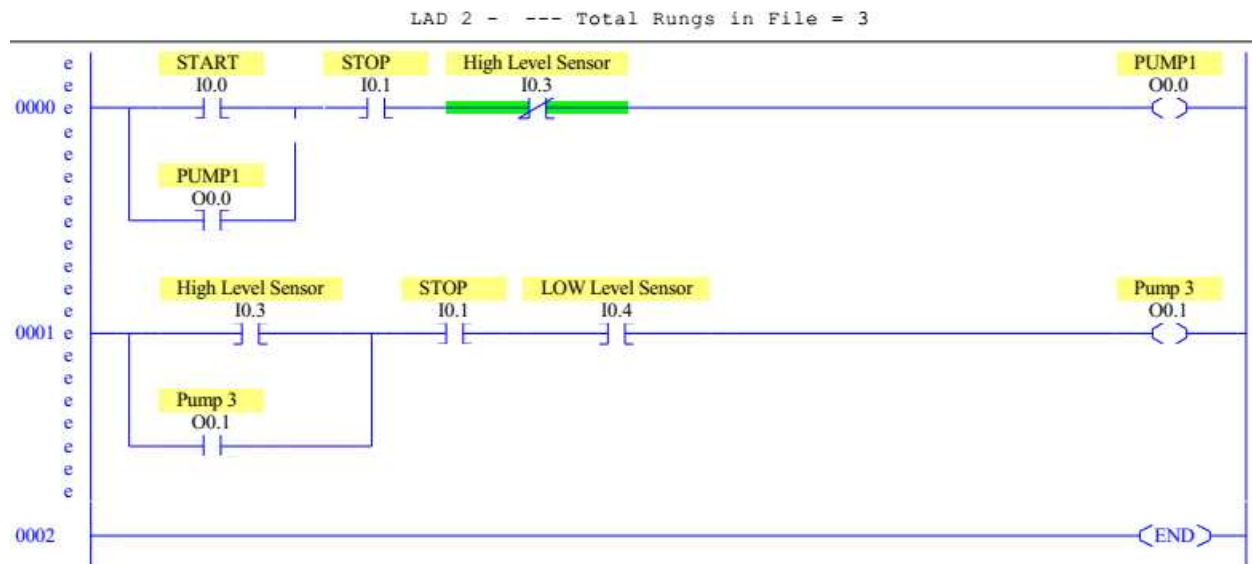Step 2: Latching of output to keep that pumps operating

Step 3: When fluid reaches high level then high level sensor gives "1" then system will be turn on (NC contact in series with first two steps)

Step 4: As high level become 'Logic 1' then Pump 3 will be start.

Step 5: Latch Pump 3 to high level sensor

Step 6: Connect low level in series with 4th and 5th step (NO contact) for triggering the pump 1

Ladder Diagram

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Task 3

Requirements: 1. Click open to Open the door but close button is not activated during this period

2. Click close to Close the door but open button is not activated during this period

3. This can be done by interlock between 2 motors

PLC Ladder Logic

Step 1: "OPEN" button is used to operate "MOTOR UP"

Step 2: Latching of output to keep that Motor up operating

Step 3: When door reaches high level then high level sensor gives "1" then system will be turn on (NO contact in series with first two steps)
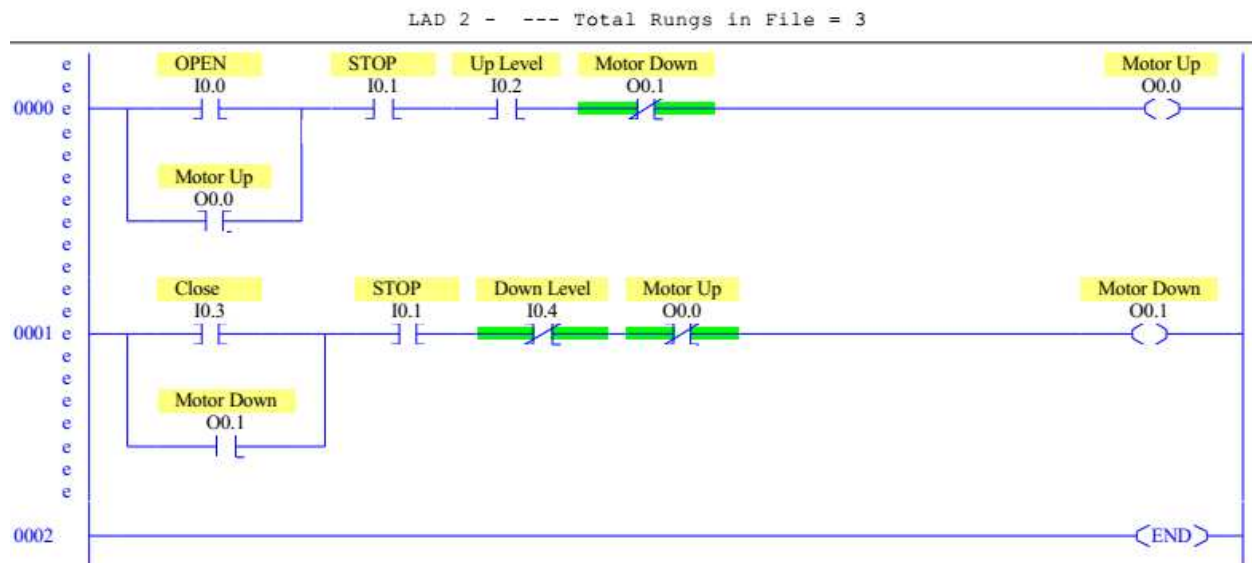
Step 4: "CLOSE" button is connected to " MOTOR DOWN" with Latching

Step 5: "CLOSE" Button is connected in series with step 4 (NO Contact)

Step 6: Lower Level(NC Contact)is connected I series with step 5

Step 7: Interlocking will be done by putting NC contact in step 3 and step 6(interchange the output)

Ladder Diagram

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Task 4

Requirements: 1. To Understand Marker which is imaginary input

2. if tank is empty, fill it by pump 1

3. if tank is full, empty by using pump 3

PLC Ladder Logic

Step 1: with the help of start button start the pump1

Step 2: Latch the output to input & Low level sensor(NC Contact)

Step 3: To stop the pump 1 after filling use High level sensor(NC Contact) in series

Step 4: As tank is full we have to empty tank with the help of pump3,as high level sensor is '1' then operate 'Pump3'

Step 5: Latch output to step 4

Step 6: Add stop button to step 3 & step 5 in series (NO Contact)

Step 7: Add Low level sensor (NO contact) in series for shutting off the pump 3 as tank is empty

Above process will happen once if we need this process continuously then we need use imaginary inputs(Markers)

Step 8: if we need above process in loop then remove 'Start' button from step 1

Step 9: Start button (NO contact) for Marker B3/11 & Latching done of marker

Step 10: As marker operates then both process i.e. step 3 & step 8 will operates by connecting marker (NO contact) in series

In above process if we apply stop button then process will stop but will not resume from last position for that purpose we need to follow the following steps

Step 11: Add rung below for step 3 & step 8

Step 12: As pump 1(NO contact) saves that data in marker B3/12 with latching

Step 13: As pump 3(NO contact) saves that data in marker B3/14 with latching

Step 14:Add 'start(NO contact)' and 'markerB3/12(No contact)' in series and parallel to latching in step 3

Step 15: Add 'start (NO contact)' and 'marker B3/14 (No contact)' in series and parallel to latching in step 8

After this if we see output at the time of emptying the tank pump 3 must operates alone but both pump 1 & pump 3 operating at the same time, to overcome this we need to follow following steps

Step 16: Add NC contact in series at step 12 for Pump1 output marker connected output of pump3 & pump 3 output marker connected to output of pump 1

Step 17: inter-locking of both pumps by connecting NC contact in series

Ladder Diagram
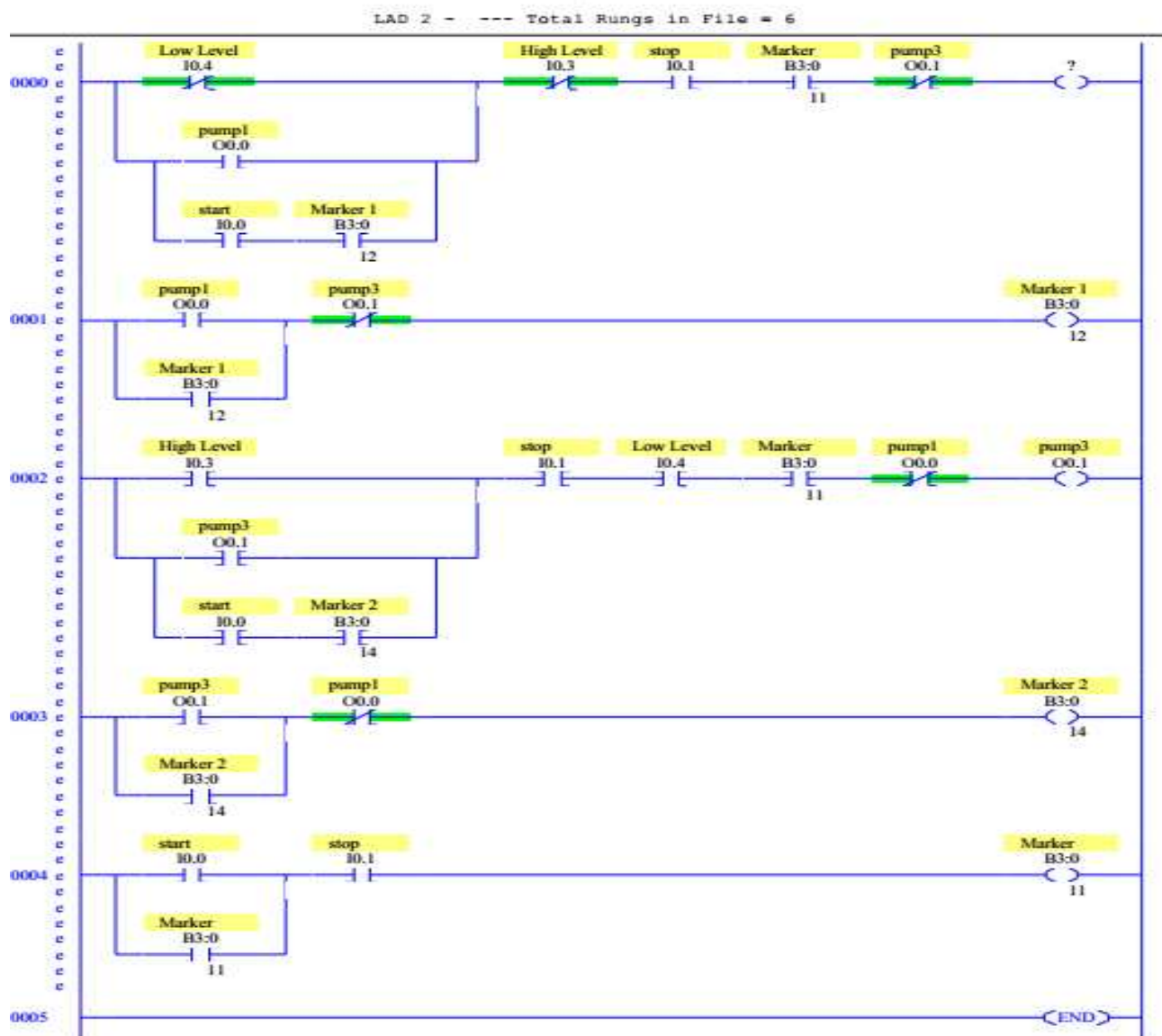
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Task 5

Requirements: 1. Fill the tank by pump 1 until high level

2. After reaching high level, Mixer & Heater start to work together,

3. After reaching 40° Celsius, stop the heater & Mixer

4. Empty the tank by pump 3

PLC Ladder Logic

Step 1: start (NO contact) is connected to marker B3/11& latch the output then add stop (NO contact) in series with start and latching

Step 2: Low level (NC contact) is for operating pump1 latch the output after latching connects markerB3/11(NO contact) in series.

Step 3: As the tanks reaches high level, it stops pump 1(for this connect High level –NC contact in series with above step) & operates mixer & Heater

Step 4 : To operate mixer & heater we need to connect High level sensor (NO contact) to mixer & heater through marker B3/11
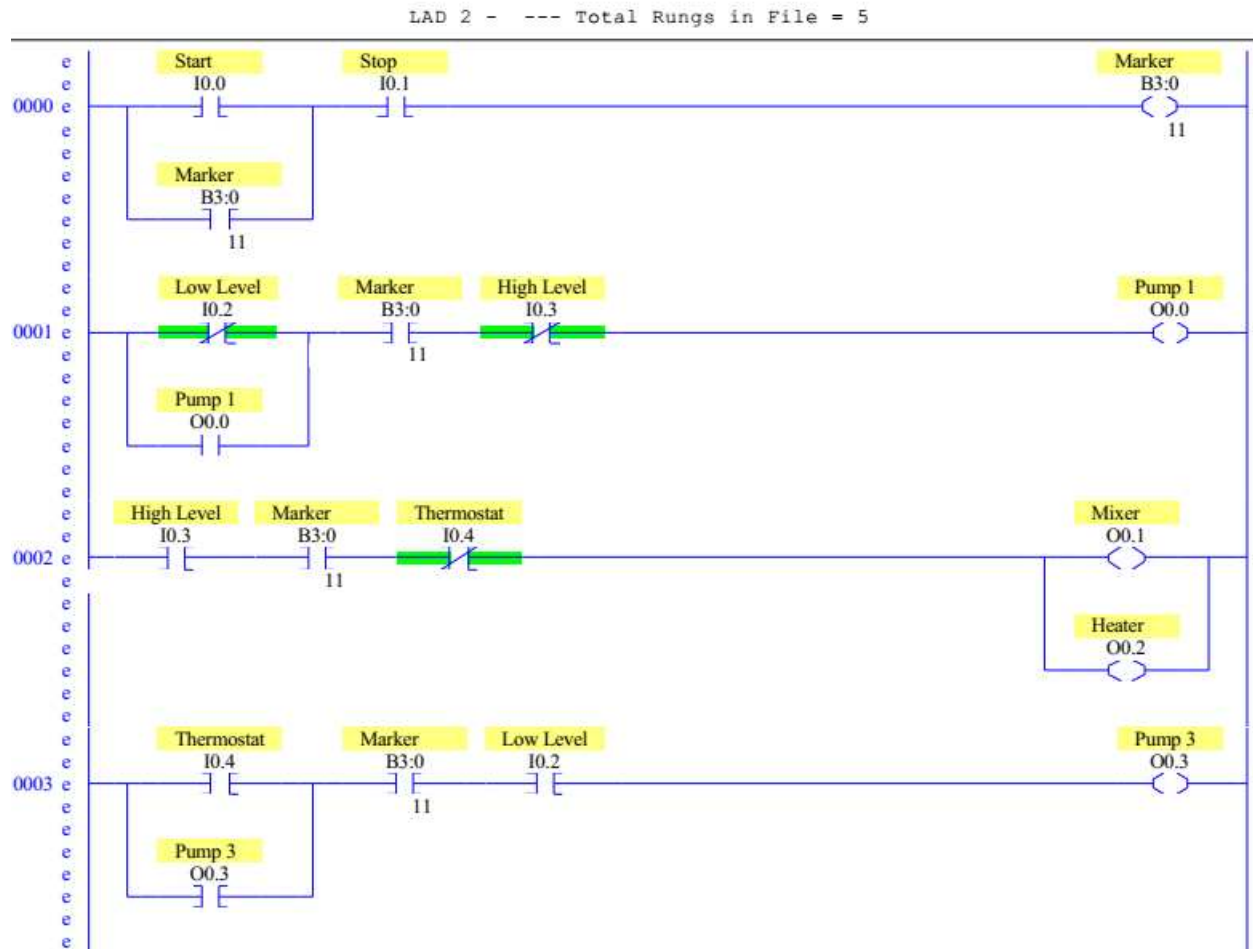
Step 5: after reaching 40° Celsius stop heater & mixer connect thermostat (NC contact) in series with step 4

Step 6: for operating Pump 3 after reaching 40°C, thermostat(NO Contact) is connected in series with Pump3 with latch output Pump 3,then marker(NO Contact) is connected in series,repetitive cycle connect Low level (NO Contact) in series with step 5

Ladder Diagram

```
                      LAD 2 -   --- Total Rungs in File = 5

        e    Start              Stop                                              Marker
        e    I0.0               I0.1                                              B3:0
 0000   e    ─┤ ├──────────────┤ ├───                                            ─( )─
        e                                                                          11
        e
        e    Marker
        e    B3:0
        e    ─┤/├──
        e      11
        e
        e    Low Level          Marker        High Level                         Pump 1
        e    I0.2               B3:0          I0.3                               O0.0
 0001   e    ─┤/├──────────────┤ ├──────────┤/├───                              ─( )─
        e                        11
        e    Pump 1
        e    O0.0
        e    ─┤ ├──
        e
        e    High Level  Marker        Thermostat                               Mixer
        e    I0.3        B3:0          I0.4                                      O0.1
 0002   e    ─┤ ├───────┤ ├──────────┤/├───                                     ─( )─
        e                 11
        e                                                                        Heater
        e                                                                        O0.2
        e                                                                       ─( )─
        e
        e    Thermostat         Marker        Low Level                         Pump 3
        e    I0.4               B3:0          I0.2                               O0.3
 0003   e    ─┤ ├──────────────┤ ├──────────┤ ├───                              ─( )─
        e                        11
        e    Pump 3
        e    O0.3
        e    ─┤ ├──
        e
```
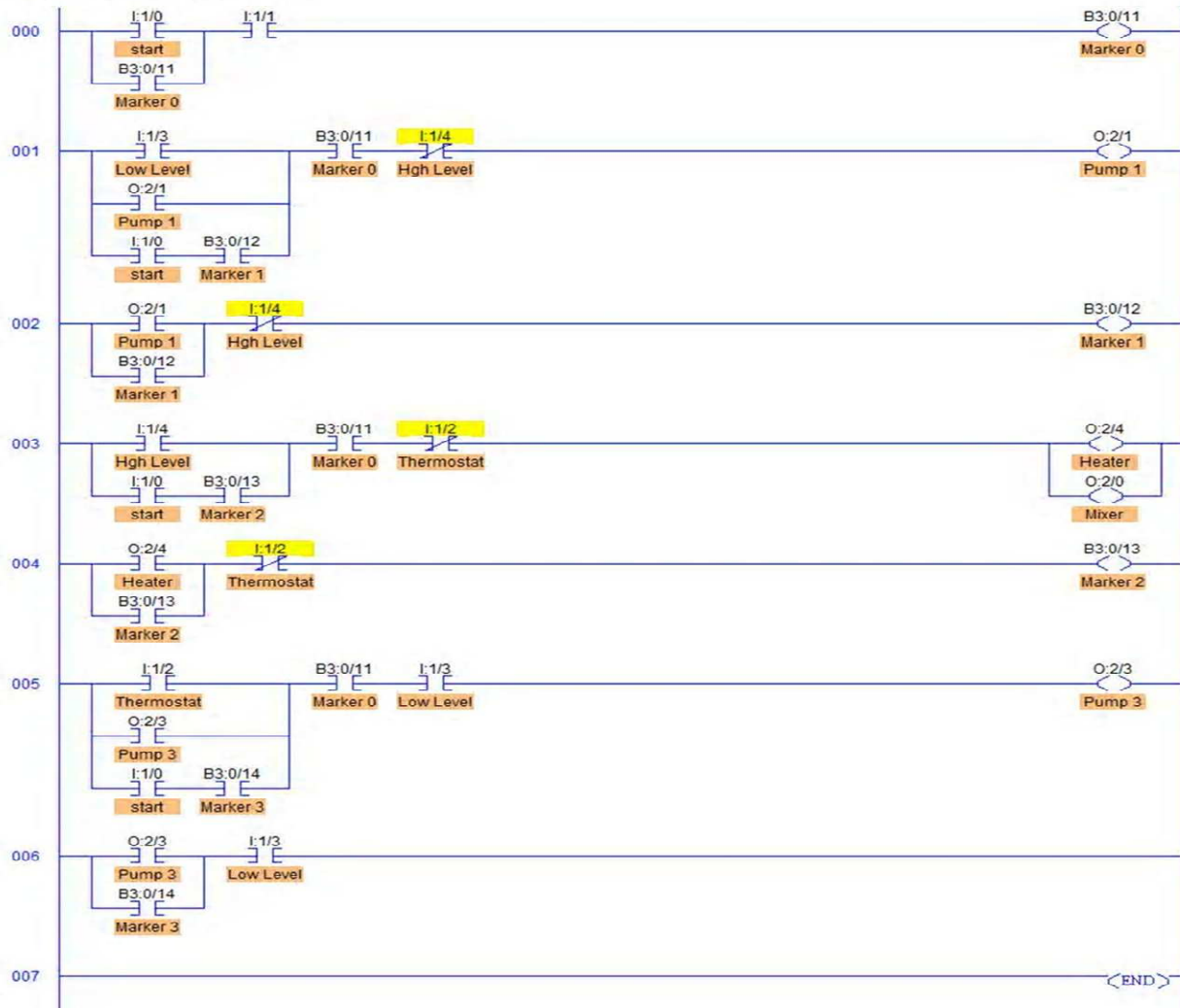
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Task 6

Requirements: 1. if we need the process from Task 5 continuous then we need to add markers in each important steps.

Ladder Diagram

LogixPro: 11/11/2019 11:51:56 AM -- -- LAD 2:

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Task 7

Requirements: 1. Turn on motor 1 for 5sec.

2. Turn off motor 1 & turn on motor 2 for 4 sec

3. Turn off Motor 2 & Turn on Motor 3 for 3sec

Ladder Diagram