Problem 1, Implementing an FSM in Picosoft

In the FSM quiz from day 20, you were given the task of **creating** a finite state machine for a vending machine (that problem is repeated below as a reference). In this problem you will be using **our** solution to that problem to **implement an FSM** in Picosoft. This will be very similar to challenges you completed in Lab 9.

Here was the problem from the quiz (repeated as a reference, you only need our solution):

For this problem you will be building a finite state machine for a drink vending machine. The drinks cost 10¢ and it only accepts dimes and nickels. (Yes, it is a very old vending machine and you are preparing to update it with a microcontroller.☺)

Your finite state machine should handle the three possible combinations of coins:

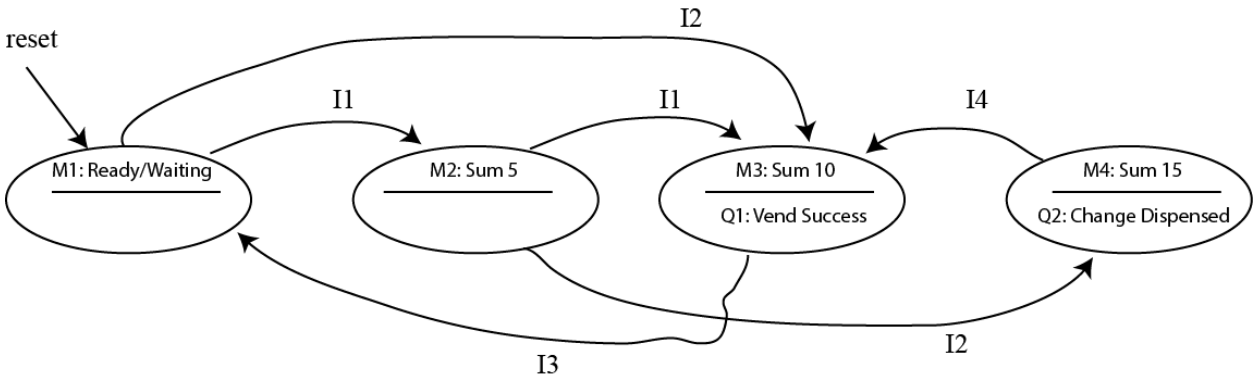
- 5¢ + 5¢
- 5¢ + 10¢
- 10¢

When exact change is given it should vend a drink. When excess money is given it should vend a drink and give correct change. Your system should automatically reset.

Inputs: nickel sensor (I1)
dime sensor (I2)
vend success sensor (I3)
change dispensed sensor (I4)

Outputs: vend the drink (Q1) and give change (Q2)

Here is our solution to this problem:

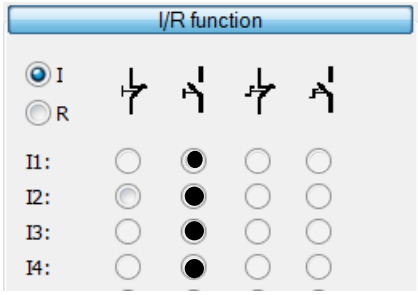


Use **THIS** solution to implement your Ladder Logic. Number ***and label*** each state as follows:

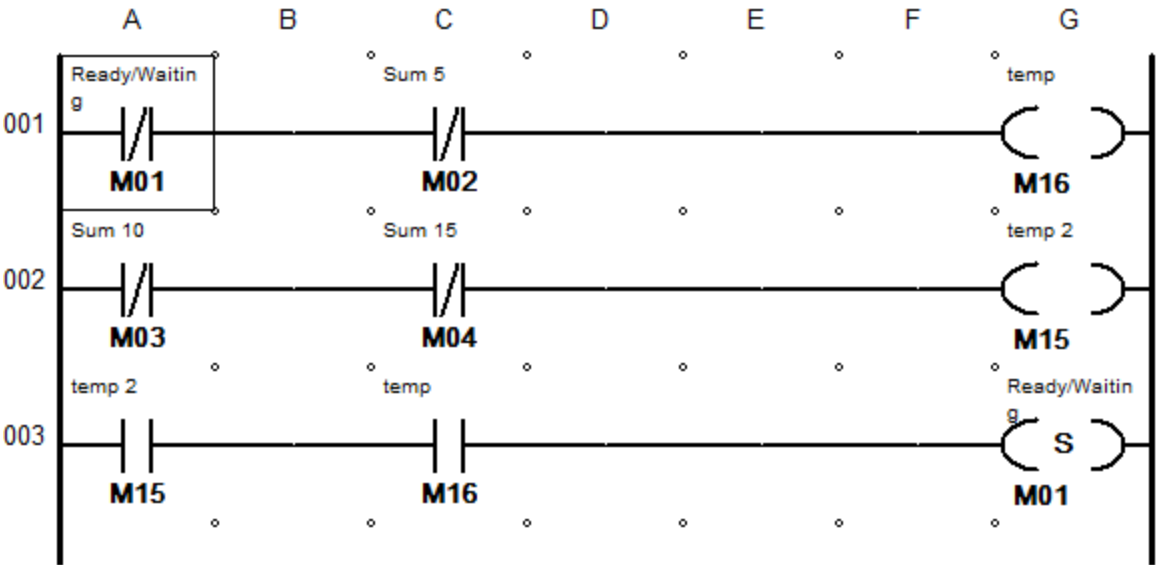
M1 – Ready / Waiting
M2 – Sum 5
M3 – Sum 10
M4 – Sum 15

(continued)

Set up the all input switches as momentary normally open switches.



Your program needs to start in State 1 (Marker 1 on, all others off). Use the following initialization code to cause this to occur:



Your grade on this problem will be based on how much you can <u>demo</u>. This rubric will be used to assign your score. You must check off parts in order until something fails or you finish all steps.

3 pts – **M1 comes on when the system starts**. Pressing I1 makes M2 come on and M1 go off (careful not to hold I1 too long)
5 pts – Pressing I1 again makes M3 come on and M2 go off
7 pts – While M3 is on, Q1 is on. (Q1 is ONLY on while M3 is on.)
10 pts – Pressing I3 makes M1 go on and M3 go off
12 pts – **Start a new run, M1 comes on.** Pressing I2 goes to M3.
15 pts – **Start a new run, M1 comes on**. Pressing I1 goes to M2, then pressing I2 goes to M4.
17 pts – While M4 is on, Q2 is on. (Q2 is ONLY on while M4 is on.)
20 pts – Pressing I4 makes M3 go on and M4 go off. It works! Well done.

Instructor Checkoff on front page.