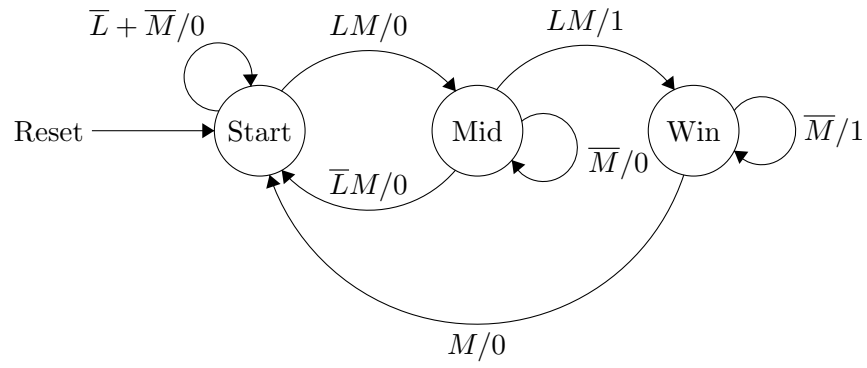


**Exercise 1 – Implementing Light Game FSM**

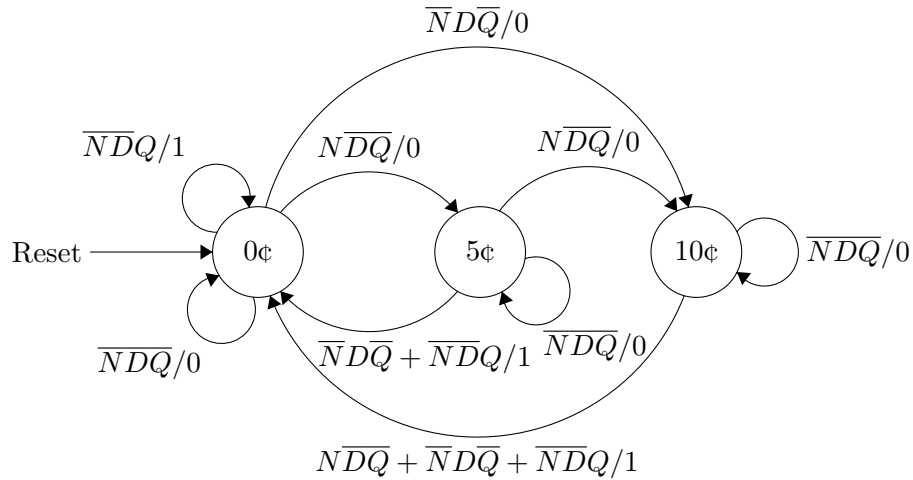
The following FSM represents a Red Light, Green Light game, where a player is only allowed to move forward ( $M = 1$ ) when the light is green ( $L = 1$ ). Here, the player wins (output  $W = 1$ ) after successfully moving twice; moving when the light is red ( $L = 0$ ) results in returning to the start



Implement this system in a module called `light_game`.

## Exercise 2 – Implementing vend15 FSM

Below is an FSM for a modified vending machine with increased cost of 15¢ for gumballs that also accepting quarters (Q: 25¢); it still does not give change and can only take one coin at a time.



Implement this system in a module called `vend15`.

### **Exercise 3 – vend15 Test Bench**

Create a test bench for vend15.

What's the minimum number of clock cycles required to thoroughly test it?