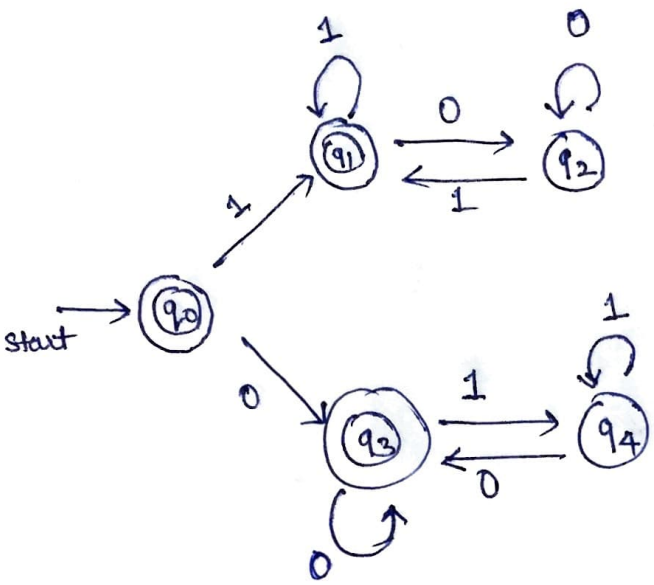
CS340 Midterm 180014 Abhay

Ans 9. Consider the DFA below.



The machine in left has a Language as $x \in \{0,1\}^* \mid x$ contain equal no. of occurences of substrings 01 and 10.

The state q_0 is for null string If the string starts with 1 it will go to q_1, rest q_3.

Now, note that q_1 is reached with a '1'. If we obtain 1, then there is no inc. in occurence of 10, 01 either. Suppose it obtain 0, then it moves to q_2. q_2 state means we have one occurence of 10 more. If it recives 0, then it remains at 0, but if we recieve 1, then it will go back to q_1, since it got the substring 01. Hence q_1 is a finish state Similar is the case when string starts with 0 (ie q_3 and q_4).

Following the algo done in class.

q_0 ✓

q_1

q_2 ✓ ✓

q_3 ✓ ✓ ✓

q_4 ✓ ✓ ✓ ✓

Min-DFA. Hence, all states are marked.