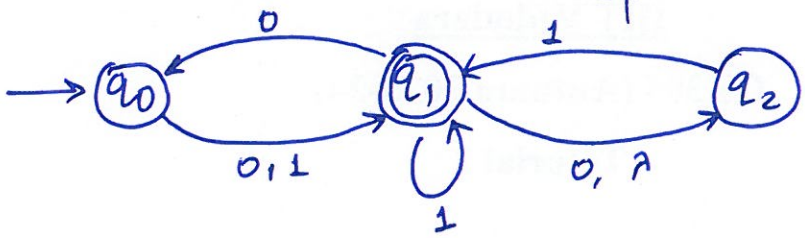
CS-305 Tutorial-2

1. Convert given NFA to DFA. Also find language accepted.



2. Prove that for every NFA with an arbitrary no. of final states, there is an equivalent NFA with only one final state. Can similar claim for DFAs hold?

3. Find an NFA without λ-transitions and with a single final state that accepts the set $\{a\} \cup \{b^n : n \geq 1\}$.

4. Prove that all finite languages are Regular.

5. Show that if L is regular, so is L^R.

6. From a language L, create a new language chop2(L) by removing the two leftmost symbols of every string in L. specifically,

$$chop2(L) = \{w : vw \in L, \text{ with } |v| = 2\}.$$

Show that if L is regular, then chop2(L) is also regular.

7. Design an algorithm to remove λ-transitions from given NFA while keeping power of new system same.

8. Design NFA for the following:
   a. $L = 0^* 1^* 0^+$ with three states.
   b. $L = 1^* (00 1^+)^*$ with three states.
   c. $L = \{w \mid w$ contains substring 0101, $\Sigma = \{0, 1\}\}$ with five states.