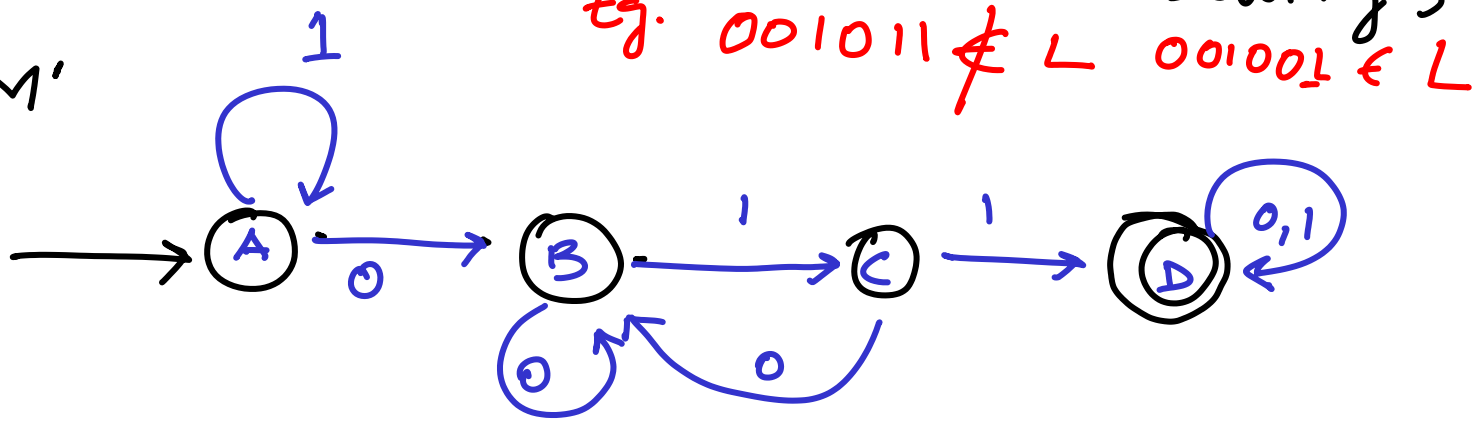
COL 352 Lecture 6 Jan 10

Design a DFA M for the language $L = \{ w \in \{0,1\}^* \mid w$ does not contain 011 as a substring $\}$

Eg. $001011 \notin L$ $001001 \in L$

M'



With a little effort, you can see that M' accepts all strings containing the pattern 011

(Try proving it rigorously)

Observation: M can be obtained from M' by flipping the accept/non-accept states since

$L(M) = \Sigma^* - L(M')$

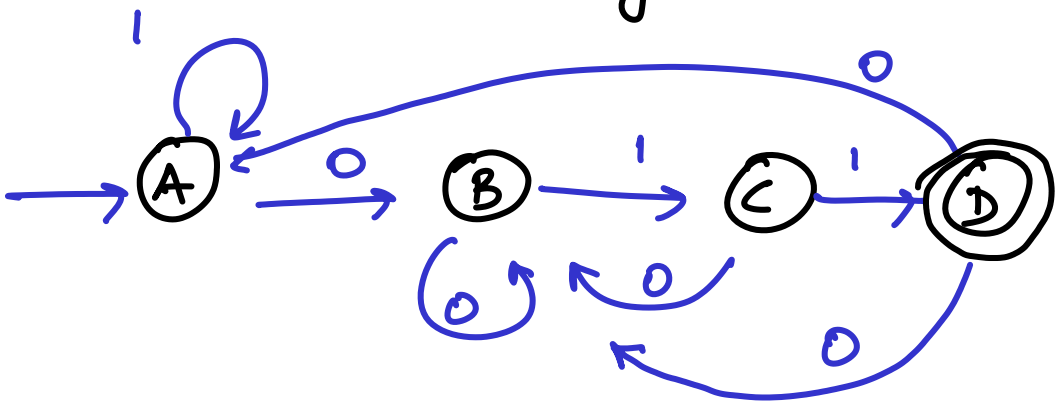
$\Rightarrow$ if there is a DFA for L then there is a DFA for $\overline{L} = \Sigma^* - L$ (complement of L)

Problem 2: Design a machine that accepts all strings ending with 011

Example $011\,011\,011\,01 \notin L$ $\{0, 00, 10, 11\} \notin L$

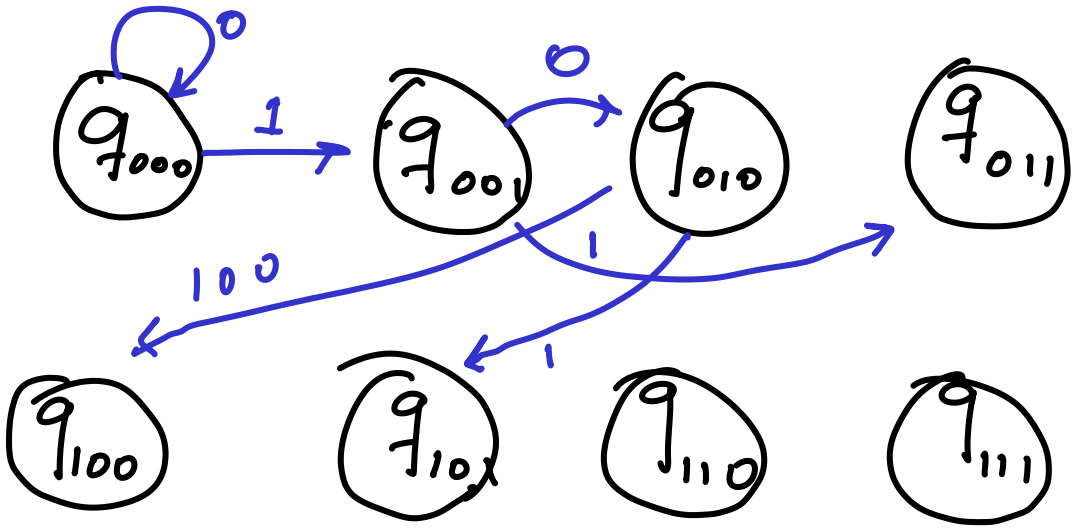
$001100011 \in L$

You can modify the previous machine



Prove that it works correctly

Another clean soln



$$\delta(q_{x_1x_2x_3}, 0) = q_{x_2x_30}$$

$$\delta(q_{x_1x_2x_3}, 1) = q_{x_2x_31}$$

$x_1 x_2 x_3$ are the most recent 3 inputs

Add some more states to initialize