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

$M'$

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 $L(M) = \Sigma^* - L(M')$. 
=) 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: 011 011 011 011

You can modify the previous machine

Prove that it works correctly
Another clean soln

\[ \delta (9_{x_1, x_2, x_3}, 0) = 9_{x_2 x_3 0} \]

\[ \delta (9_{x_1, x_2, x_3}, 1) = 9_{x_2 x_3 1} \]

\( x_1, x_2, x_3 \) are the most recent 3 inputs

Add some more states to initialize