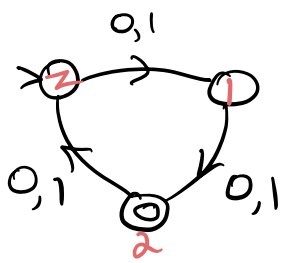
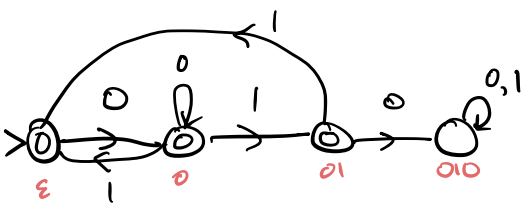
How to construct a DFA D that accepts $L(M_1) \cup L(M_2)$, where M_1 and M_2 are DFAs.

Eg M_1 :

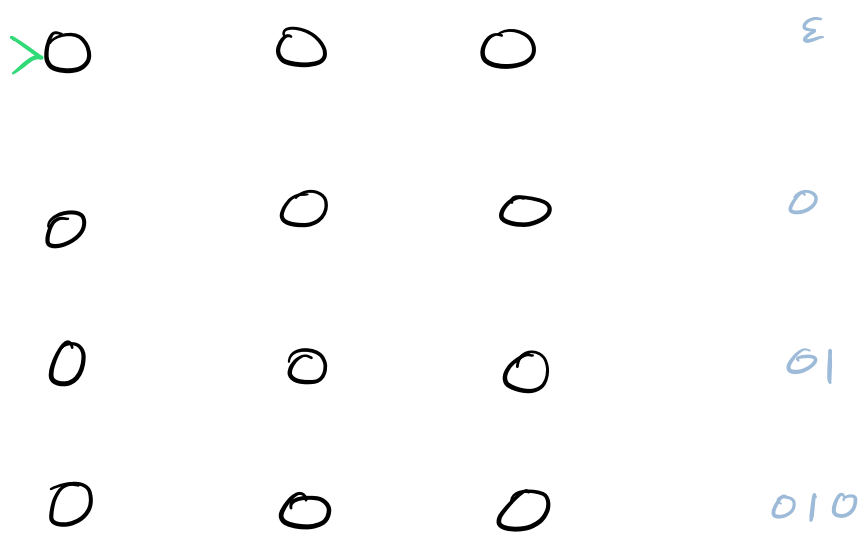


$L(\quad) = \{ w \in \{0,1\}^* \mid$ $\}$

M_2 :



"length $\equiv_3 0$" "length $\equiv_3 1$" "length $\equiv_3 2$"



$M_1 = (Q_1, \Sigma, \delta_1, s_1, F_1)$ ← a DFA

$M_2 = (Q_2, \Sigma, \delta_2, s_2, F_2)$ ← a DFA

Then we can construct a DFA M that accepts $L(M_1) \cup L(M_2)$ as follows:

$M = (\quad \times \quad , \quad , \delta , (\quad) , \quad \times \quad \cup \quad \times \quad)$

where $\delta((\quad), \quad) =$