

Tutorial 1

6th August, 2025

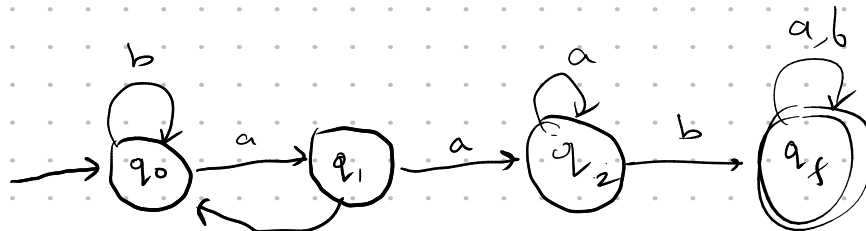
DFA : (Q, Σ, A, q_0, q_f)

$\delta : Q \times A \rightarrow Q$

Q1) $L = \{w \in \{a, b\}^* \mid w \text{ contains "aab" substring}\}$

Construct a DFA which accepts L.

Solⁿ:



Q2

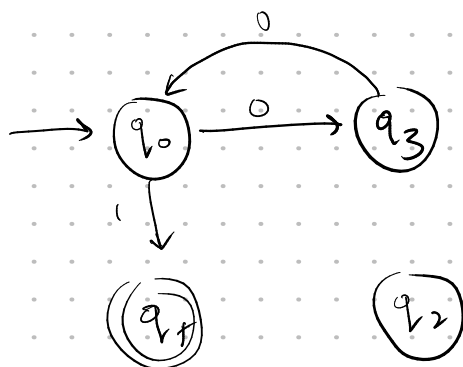
$L = \{w \in \{0,1\}^* \mid w \text{ contains even no of 0's and odd no of 1's}\}$

Construct DFA

Solⁿ:

The cases are:

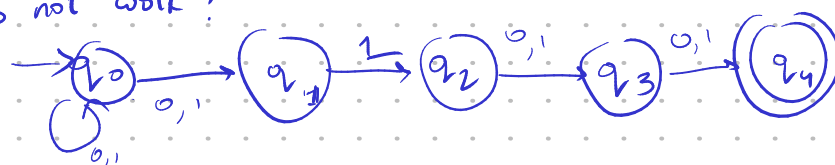
- (even 0s, odd 1s)
- (even 0s, even 1s)
- (odd 0s, odd 1s)
- (odd 0s, even 1s)



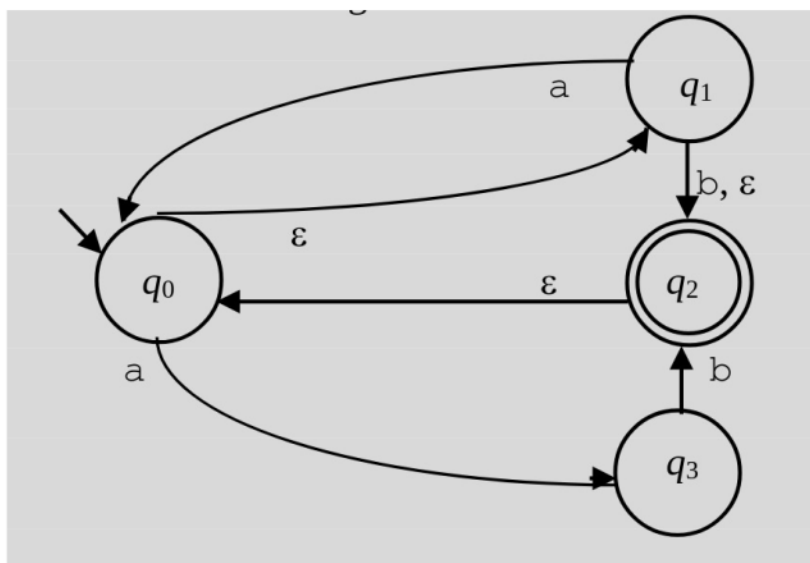
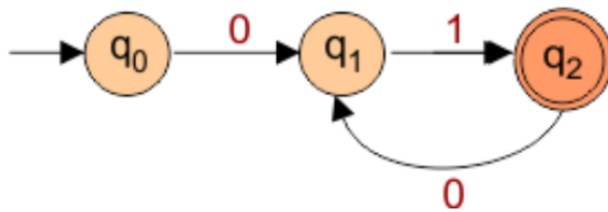
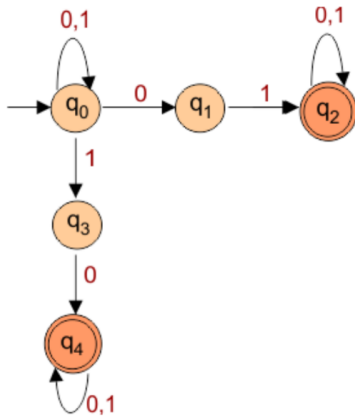
$L = \{w \in \{0,1\}^* \mid w \text{ has its third last symbol as 1}\}$

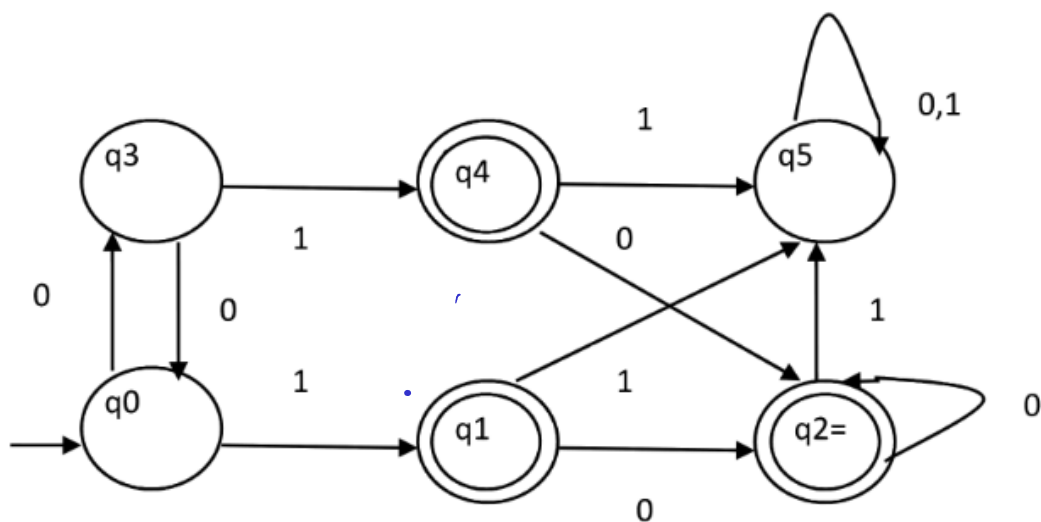


Why does this not work?



The above DFA won't accept "100".
 DFA which accepts the language





(Q) Minimize the above DFA.

Solⁿ:

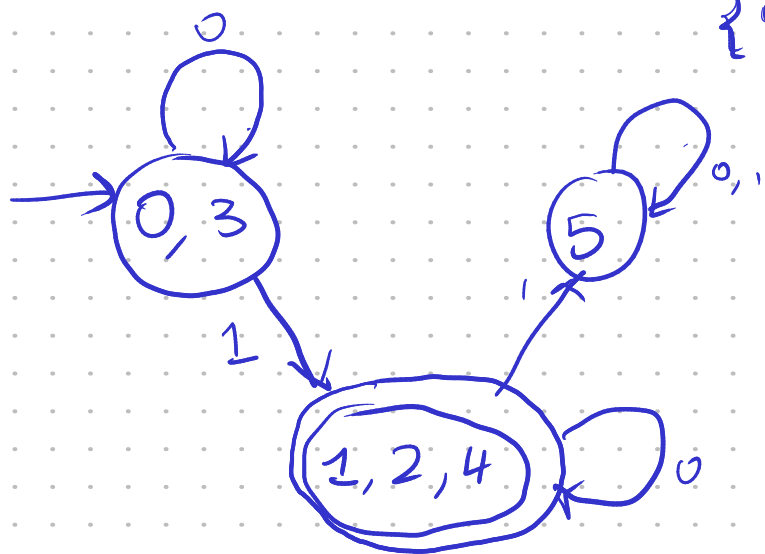
Separate states into groups / equivalence classes.

Step 1: Group all the final & non final states

I $\rightarrow \{0, 3, 5\}$, $\{1, 2, 4\}$ \leftarrow II

$\{0, 3\}$ $\{5\}$ $\{1, 2, 4\}$

$\{0, 3\}$ $\{5\}$ $\{1, 2, 4\}$



NB: Remove all unreachable states before starting the algo.