

FORMAL LANGUAGE AND AUTOMATA - LT 1

NAME: Rahul Gred

Reg No: RA1911030010094.

Section: 02

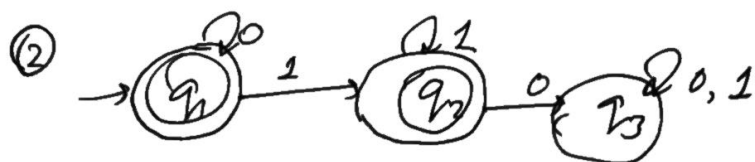
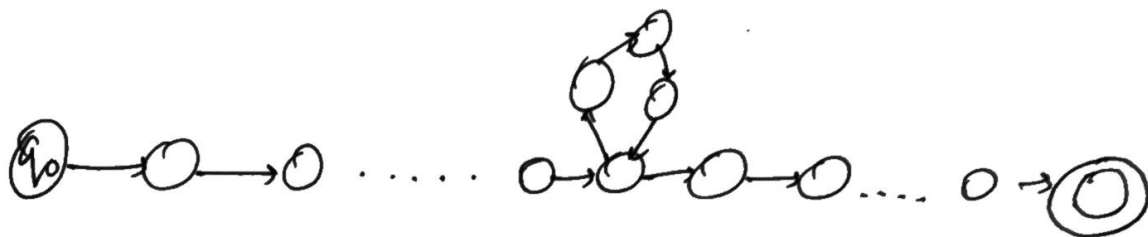
③ $L_1 = \{0^n 1^n \mid n \geq 0\}$ is non regular.

→ Assume L_1 is regular.

→ Then there is a DFA $M = (Q, \Sigma, \delta, q_0, R)$ recognizing L_1 .

→ 0^i and 0^j lead the same state.

→ Then since M accepts $0^i 1^i$, it also accepts $0^j 1^i$, which is incorrect, contradiction.



$$q_1 = \epsilon + q_1 0 \rightarrow \textcircled{1}$$

$$q_2 = q_1 1 + q_2 1 \rightarrow \textcircled{2}$$

$$q_3 = q_2 0 + q_3 0 + q_3 1 \rightarrow \textcircled{3}$$

Final state (q_1)

$$q_1 = \epsilon + q_1 0$$

$$R = Q + RP$$

$$R = Q + RP$$

$$R = QP^*$$

$$q_1 = \epsilon \cdot 0^*$$

$$q_1 = 0^*$$

$\rightarrow \textcircled{1}$

$$\epsilon R = R$$

Final state (q_2)

$$q_2 = q_1 1 + q_2 1$$

$$q_2 = 0^* 1 + q_2 1$$

$$R = Q + RP$$

$$R = Q + RP$$

$$R = QP^*$$

$$q_2 = 0^* 1 (1)^*$$

$$R = 0^* + 0^* 1 1^*$$

$$= 0^* (\epsilon + 11^*)$$

$$\epsilon + RP^* = R^*$$

$$= 0^* 1^* \text{ (Regular Expression) }.$$