

8)

→ A regular expression is a shorthand way of showing how a regular language is built from the base set of regular languages

→ For each RE (E) , there is a RL $(L(E))$

Properties

1) Additive (+)

$$R + E = E + R$$

$$R + \emptyset = \emptyset + R = R$$

2) Product (.)

$$R \emptyset = \emptyset R = \emptyset$$

$$R \Lambda = \Lambda R = R$$

$$(R E) F = R (E F)$$

3) Distributive

$$R(E + F) = RE + RF$$

$$(R + E)F = RF + EF$$

4) Closure

$$\emptyset^* = \Lambda^* = \Lambda$$

$$R^* = R^* R^* = (R^*)^* = R + R^*$$

$$R R^* = R^* R$$

$$R(E R)^* = (R E)^* R$$

5) Identity

$$\emptyset + \emptyset = \emptyset$$

$$\emptyset \cdot \emptyset = \emptyset \cdot \emptyset = \emptyset$$

$$\epsilon \cdot \emptyset = \emptyset \cdot \epsilon = \emptyset$$

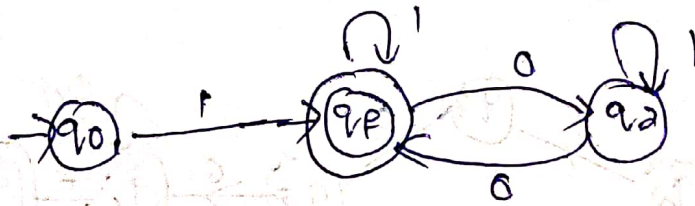
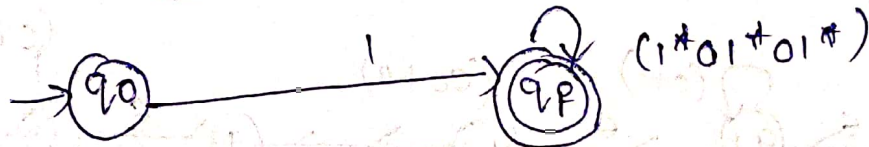
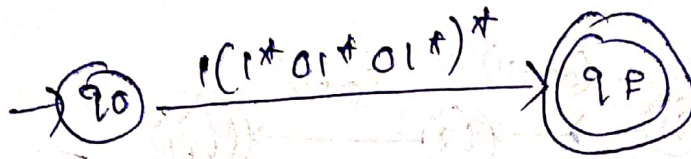
$$\emptyset + \emptyset = \emptyset$$

$$\emptyset^* \cdot \emptyset^* = \emptyset^*$$

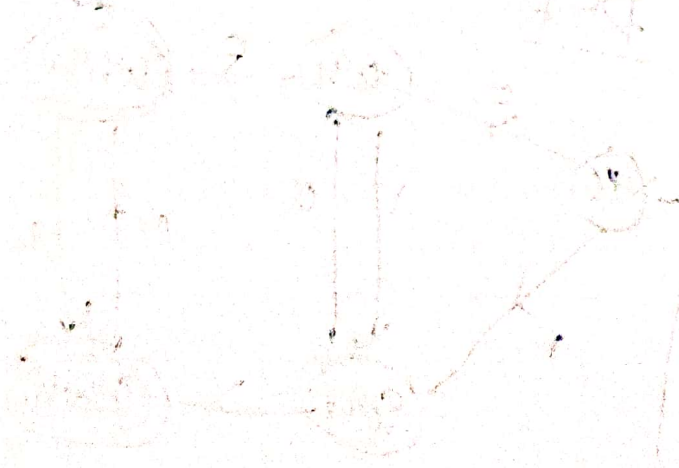
$$(\emptyset^*)^* = \emptyset^*$$

Ex: Regular Express to Finite Automate

$$(1^* 0 1^* 0 1^*)^*$$



	1	0
q0	q1	q2
q1	q1	q2
q2	q1	q2



	1	0	0
q0	q1	q2	q3
q1	q1	q2	q3
q2	q1	q2	q3
q3	q1	q2	q3