CSE331

ASSIGNMENT 01

SECTION 16

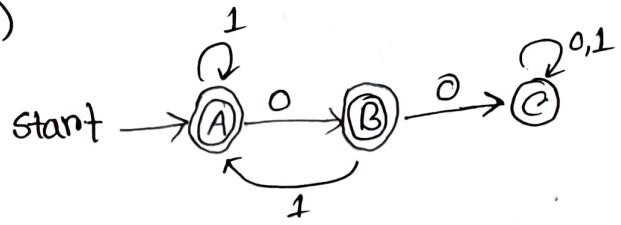
SUMMER'24

B M RAUF

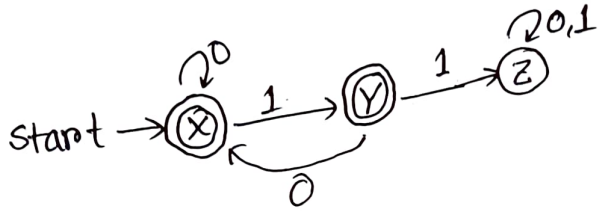
ID: 22201782

(1)

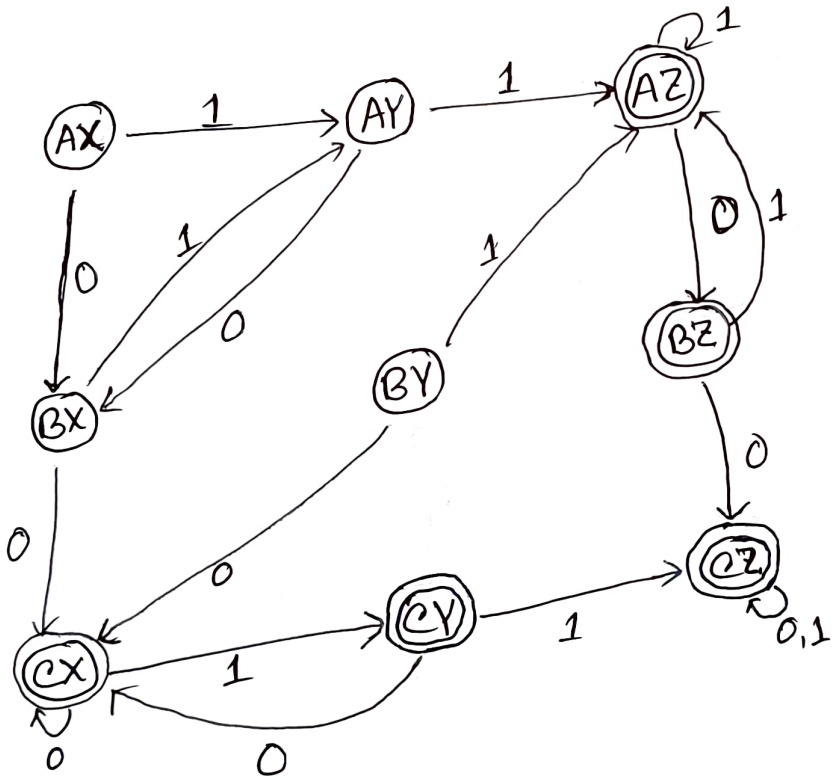
A $L_1(M)$



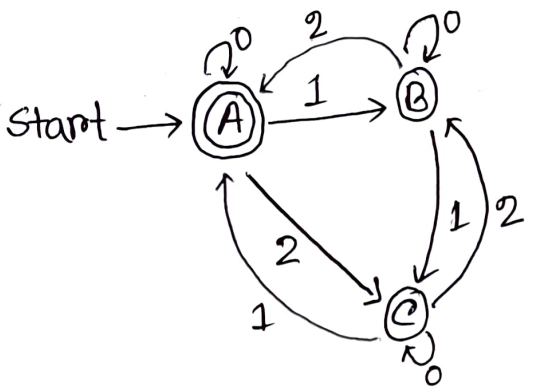
$L_2(M)$



$(L_1(M) \cap L_2(M))'$



B

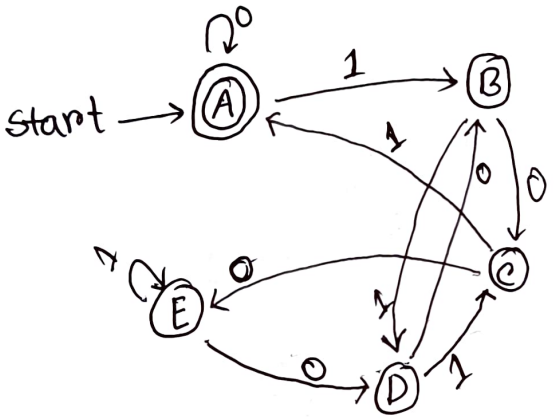


A → %3 = 0

B → %3 = 1

C → %3 = 2

C



A → %5 = 0

B → %5 = 1

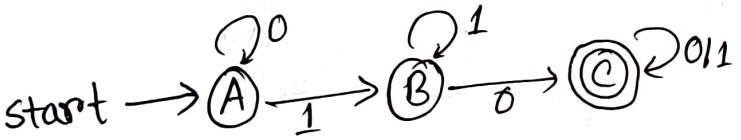
C → %5 = 2

D → %5 = 3

E → %5 = 4

(2n+0, 2n+1)

D



(2)

A $L1(M) \rightarrow (\Sigma\Sigma 1)^* (1|01|\epsilon)(1|01|\epsilon)$

$L2(M) \rightarrow 0^* (1000^*)^*$

$L(M) \rightarrow L1 \cap L2$

$\rightarrow (001)^*00$

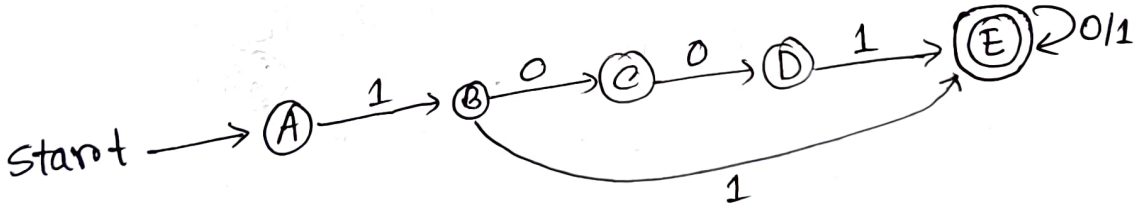
B $0\Sigma^*0|1\Sigma^*1|011$

C $0\Sigma^*0|1\Sigma^*1|011$

D $(011)^*(\epsilon|0|00|11|110)^*$

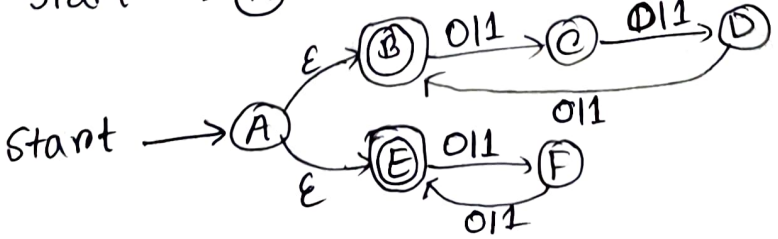
(3)

A



B

C



④

A

Start state = $\{A\} = S$

$\delta(S,0) = \{A\} = S$

$\delta(S,1) = \{A,B\} \xrightarrow{\varepsilon} \{A,B,C\} = M$

$\delta(M,0) = \{A,C\} = N$

$\delta(M,1) = \{A,B,D\} \xrightarrow{\varepsilon} \{A,B,C,D\} = P$

$\delta(N,0) = \{A\} = S$

$\delta(N,1) = \{A,B,D\} \xrightarrow{\varepsilon} \{A,B,C,D\} = P$

$\delta(P,0) = \{A,C,D\} = Q$

$\delta(P,1) = \{A,B,D\} \xrightarrow{\varepsilon} \{A,B,C,D\} = P$

$\delta(Q,0) = \{A,D\} = R$

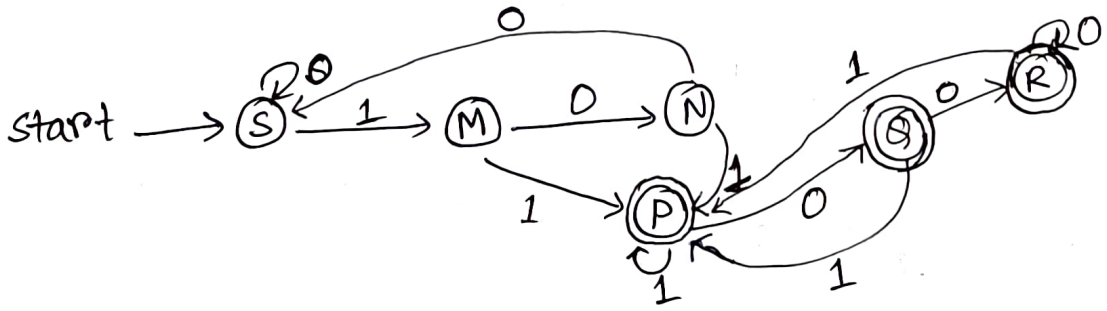
$\delta(Q,1) = \{A,B,D\} \xrightarrow{\varepsilon} \{A,B,C,D\} = P$

$\delta(R,0) = \{A,D\} = R$

$\delta(R,1) = \{A,B,D\} \xrightarrow{\varepsilon} \{A,B,C,D\} = P$

Total states: $\{A\} = S$; $\{A,B,C\} = M$; $\{A,C\} = N$; $\{A,B,C,D\} = P$

$\{A,C,D\} = Q$; $\{A,D\} = R$



B

Start state = {A,B} = S

$\delta(S,0) = \{A\} \xrightarrow{\varepsilon} \{A,B\} = S$

$\delta(S,1) = \{C\} = M$

$\delta(M,0) = \{B,C\} = N$

$\delta(M,1) = \{B\} = P$

$\delta(N,0) = \{A,B,C\} \xrightarrow{\varepsilon} \{A,B,C\} = Q$

$\delta(N,1) = \{B\} = P$

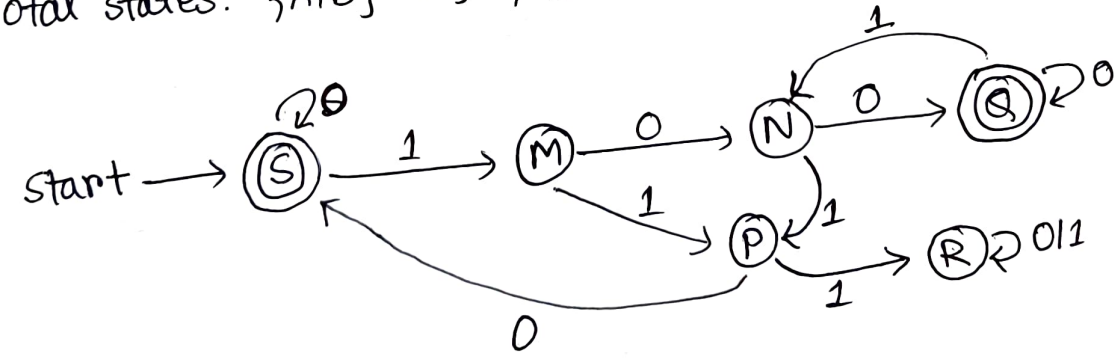
$\delta(P,0) = \{A\} \xrightarrow{\varepsilon} \{A,B\} = S$

$\delta(P,1) = \emptyset = R$

$\delta(Q,0) = \{A,B,C\} \xrightarrow{\varepsilon} \{A,B,C\} = Q$

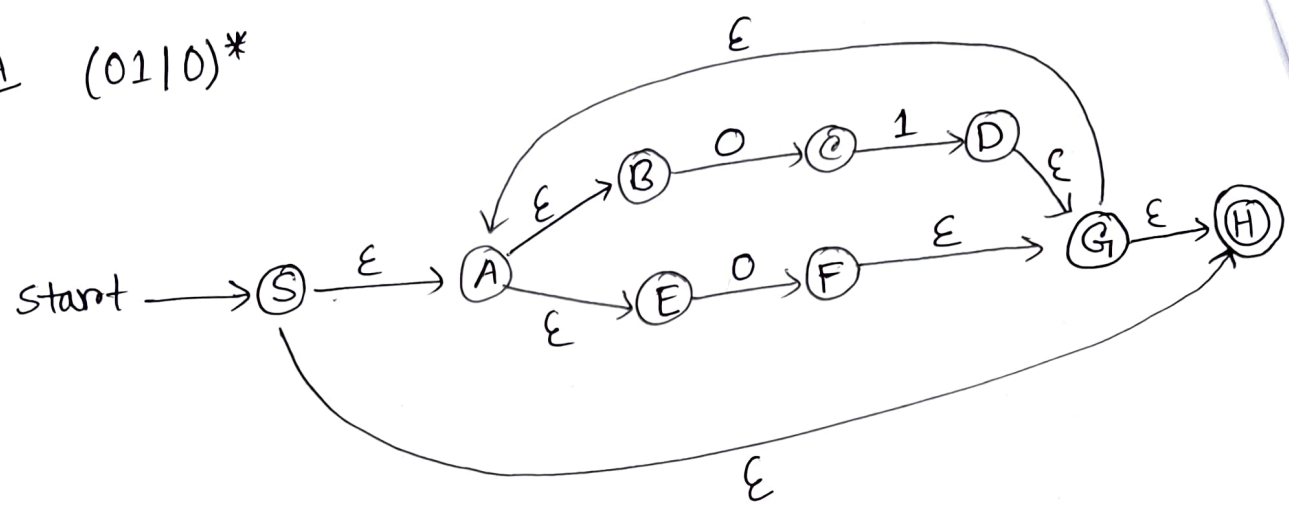
$\delta(Q,1) = \{C,B\} = \{B,C\} = N$

Total states: {A,B} = S; {C} = M; {B,C} = N; {B} = P; {A,B,C} = Q

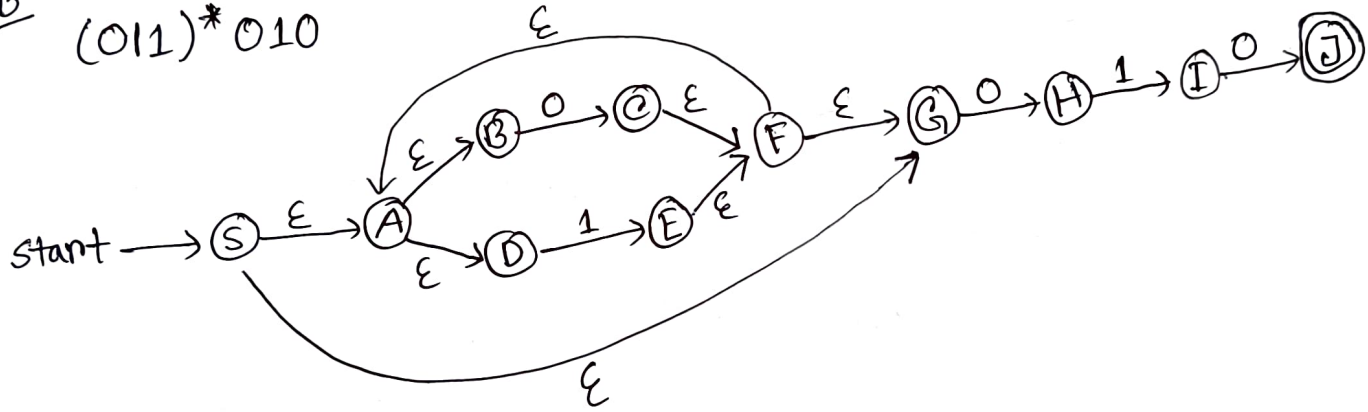


(5)

A (01|0)*

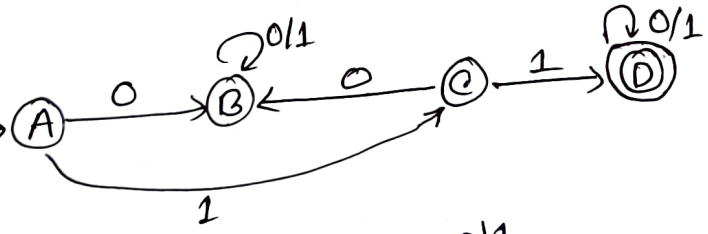


B (011)*010



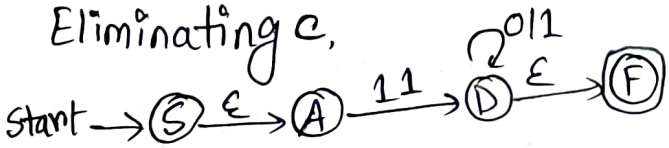
(6)

A

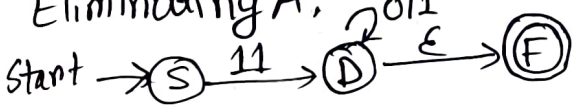


Eliminating B,

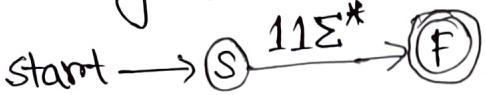
Eliminating C,



Eliminating A,

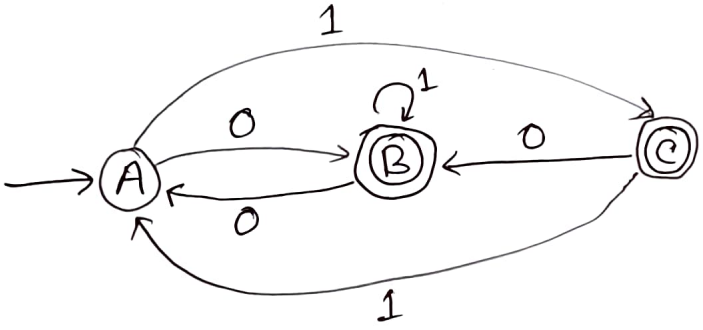


Eliminating D,

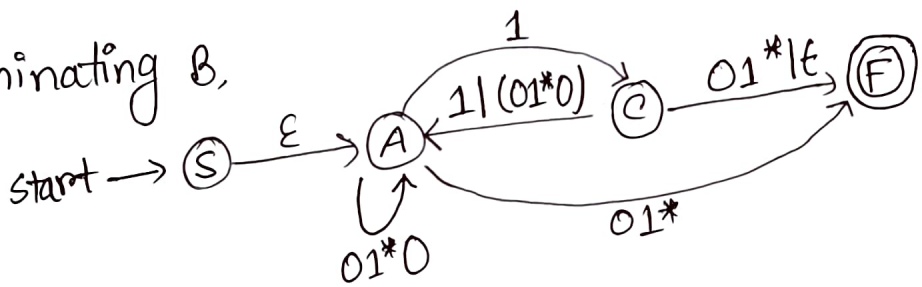


RE = $11\Sigma^*$

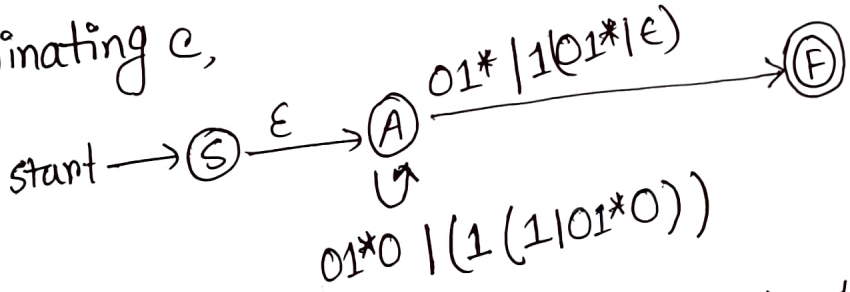
(B)



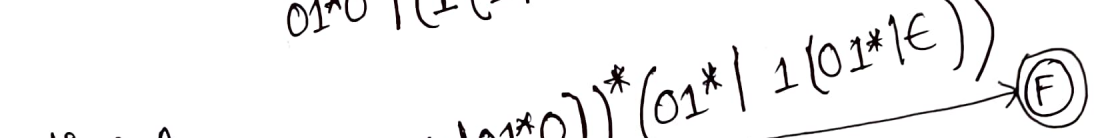
Eliminating B,



Eliminating C,



Eliminating A,



RE = $(01^*0|1(1|01^*0))^*(01^*|1(01^*|\epsilon))$