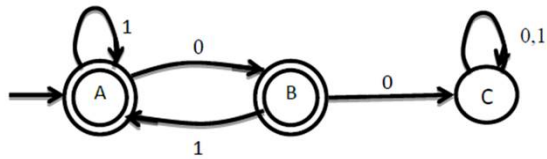


$L1 = \{x/x \text{ 00 is not substring of } x, x \in \{0,1\}^*\}$

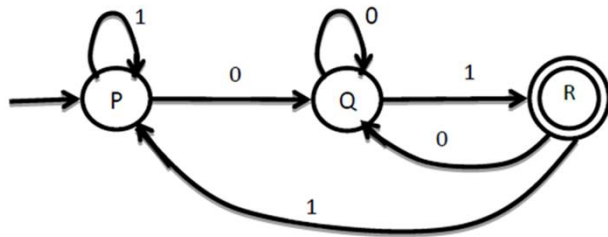
$L2 = \{x/x \text{ ends with 01, } x \in \{0,1\}^*\}$

Draw finite Automata for  $L1 \cup L2$ ,  $L1 \cap L2$  and  $L1 - L2$ .

M1



M2



Here  $Q_1=\{A,B,C\}$  and  $Q_2=\{P,Q,R\}$

So,  $Q = Q_1 \times Q_2 = \{AP, AQ, AR, BP, BQ, BR, CP, CQ, CR\}$

$q_0=(q_1, q_2)=(A,P)$

$\delta((A,P),0) = (\delta(A,0), \delta(P,0))$   
 $= BQ$

$\delta((A,P),1) = (\delta(A,1), \delta(P,1))$   
 $= AP$

$\delta((B,Q),0) = (\delta(B,0), \delta(Q,0))$   
 $= CQ$

$\delta((B,Q),1) = (\delta(B,1), \delta(Q,1))$   
 $= AR$

$\delta((C,Q),0) = (\delta(C,0), \delta(Q,0))$   
 $= CQ$

$\delta((C,Q),1) = (\delta(C,1), \delta(Q,1))$   
 $= CR$

$\delta((A,R),0) = (\delta(A,0), \delta(R,0))$   
 $= BQ$

$\delta((A,R),1) = (\delta(A,1), \delta(R,1))$   
 $= AP$

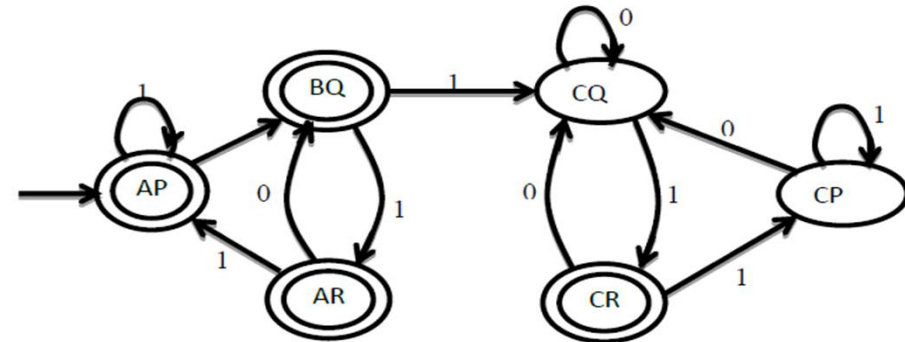
$\delta((C,R),0) = (\delta(C,0), \delta(R,0))$   
 $= CQ$

$\delta((C,R),1) = (\delta(C,1), \delta(R,1))$   
 $= CP$

$\delta((C,P),0) = (\delta(C,0), \delta(P,0))$   
 $= CQ$

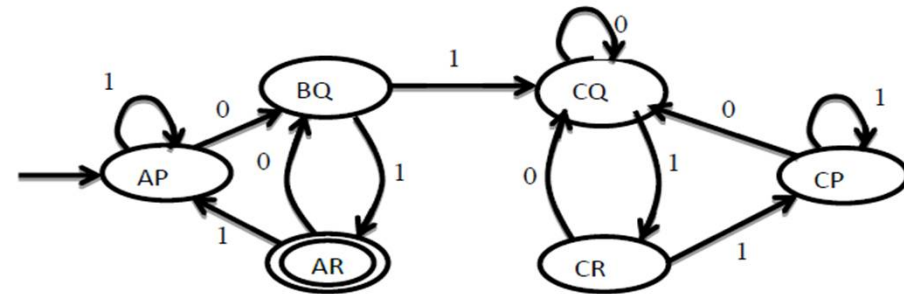
$\delta((C,P),1) = (\delta(C,1), \delta(P,1))$   
 $= CP$

**$L_1 \cup L_2$**



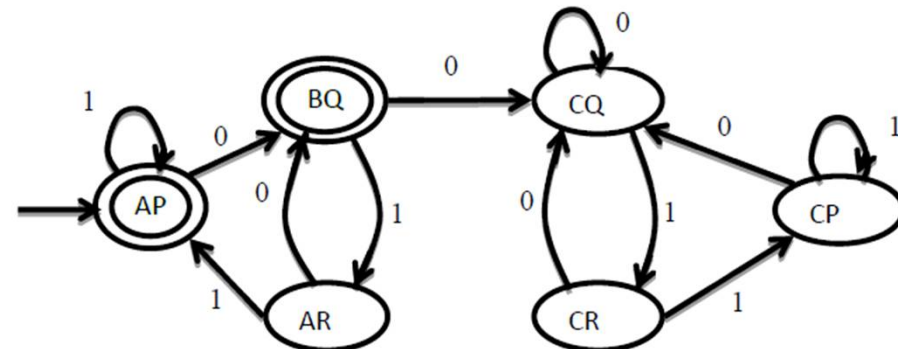
Finite Automata for  $L_1 \cup L_2$

**$L_1 \cap L_2$**



Finite Automata for  $L_1 \cap L_2$

**$L_1 - L_2$**



Finite Automata for  $L_1 - L_2$

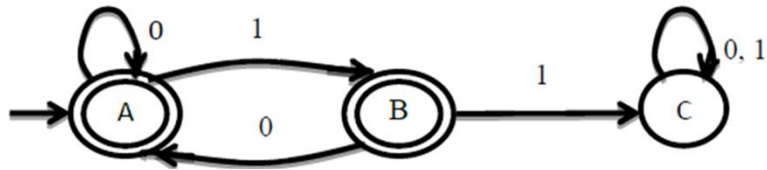
Draw Finite Automata for following languages:

$L1 = \{x/x \text{ 11 is not substring of } x, x \in \{0,1\}^*\}$

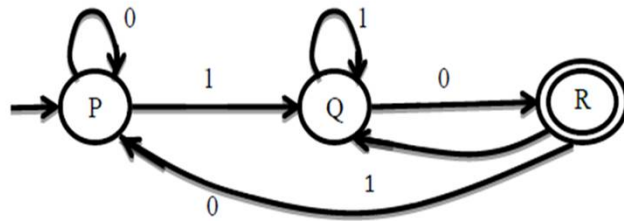
$L2 = \{x/x \text{ ends with 10, } x \in \{0,1\}^*\}$

Draw finite Automata for  $L1 \cap L2$  and  $L1 - L2$ .

M1



M2



Here  $Q1=\{A,B,C\}$ ,  $Q2=\{P,Q,R\}$

So,  $Q = Q1 \times Q2 = \{AP,AQ,AR,BP,BQ,BR,CP,CQ,CR\}$

$q_0=(q_1,q_2)$

$q_0=(A,P)$

$\delta((A,P),0) = (\delta(A,0), \delta(P,0))$   
 $= AP$

$\delta((A,P),1) = (\delta(A,1), \delta(P,1))$   
 $= BQ$

$\delta((B,Q),0) = (\delta(B,0), \delta(Q,0))$   
 $= AR$

$\delta((B,Q),1) = (\delta(B,1), \delta(Q,1))$   
 $= CQ$

$\delta((A,R),0) = (\delta(A,0), \delta(R,0))$   
 $= AP$

$\delta((A,R),1) = (\delta(A,1), \delta(R,1))$   
 $= BQ$

$\delta((C,Q),0) = (\delta(C,0), \delta(Q,0))$   
 $= CR$

$\delta((C,Q),1) = (\delta(C,1), \delta(Q,1))$   
 $= CQ$

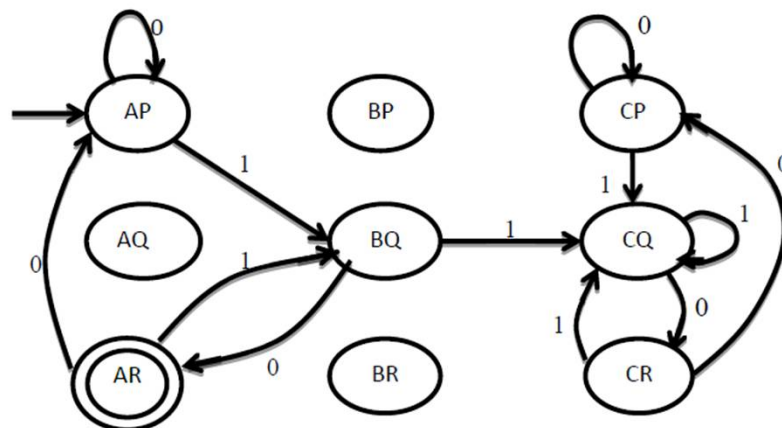
$\delta((C,R),0) = (\delta(C,0), \delta(R,0))$   
 $= CP$

$\delta((C,R),1) = (\delta(C,1), \delta(R,1))$   
 $= CQ$

$\delta((C,P),0) = (\delta(C,0), \delta(P,0))$   
 $= CP$

$\delta((C,P),1) = (\delta(C,1), \delta(P,1))$   
 $= CQ$

$L1 \cap L2$



$L1 - L2$

