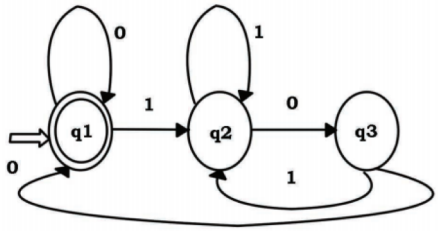
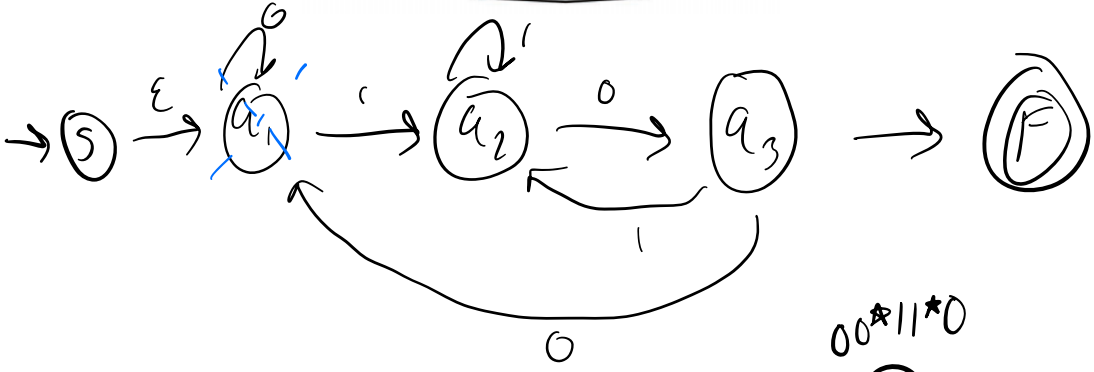
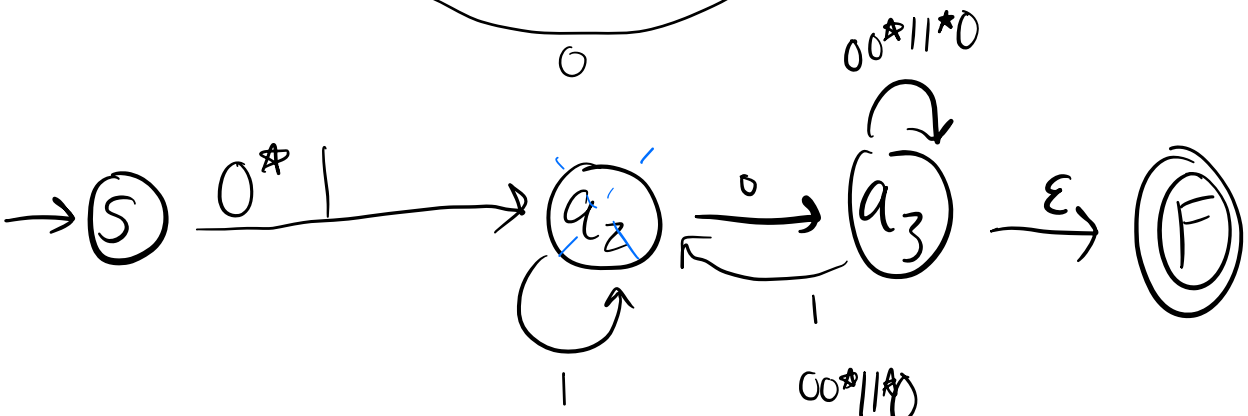
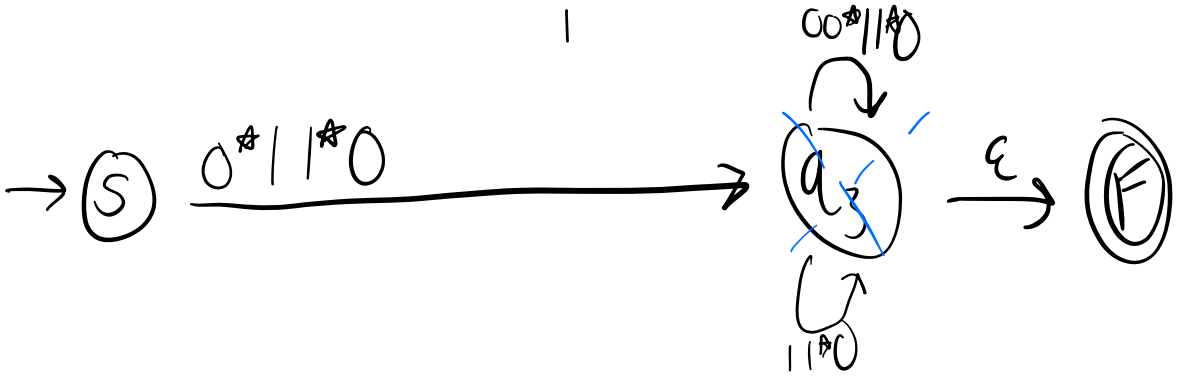
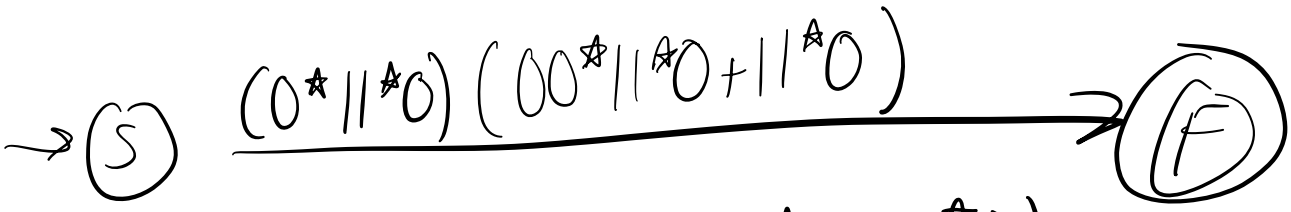
1. Convert the given FA to RE using state elimination method.





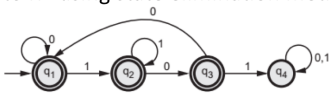




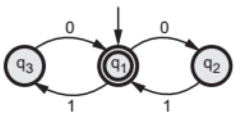


RE = $(0^*11^*0)(00^*11^*0+11^*0)$

2. Convert the given FA to RE using state elimination method.



3. Convert the given FA to RE using Arden's theorem.



$R = RP + Q$

$R = QP^*$

$q_1 : \varepsilon + 0q_3 + 1q_2$

$q_2 : 0q_1$

$q_3 : 1q_1$

$q_1 = \varepsilon + 0(1q_1) + 1(0q_1)$

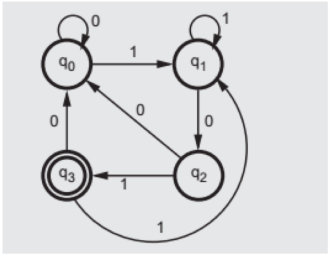
$q_1 = \varepsilon + 01q_1 + 10q_1$

$q_1 = q_1(01 + 10) + \varepsilon$

$R \quad R \quad P \quad Q$

$q_1 = \varepsilon (01 + 10)^*$

4. Convert the given FA to RE using Arden's theorem.



$q_0 = \varepsilon + 0q_0 + 0q_2 + 0q_3$

$q_1 = 1q_0 + 1q_1 + 1q_3$

$q_2 = 0q_1$

$q_3 = 1q_2$

$R = RP + Q$

$R = QP^*$

$q_3 = 1(0q_1) = 10q_1$

$q_1 = 1q_0 + 1q_1 + 1(10q_1)$

$q_1 = q_1(1 + 110) + 1q_0$

(R = q1, P = 1 + 110, Q = 1q0)

$q_1 = 1q_0(1 + 110)^*$

$q_0 = \varepsilon + 0q_0 + 0q_2 + 0q_3$

$q_0 = \varepsilon + 0q_0 + 00q_1 + 010q_1$

$q_0 = \varepsilon + q_1(00 + 010) + 0q_0$

$q_0 = \varepsilon + 1q_0(1 + 110)^*(00 + 010) + 0q_0$

$q_0 = \varepsilon + q_0[1(1 + 110)^* + (00 + 010) + 0] + \varepsilon$

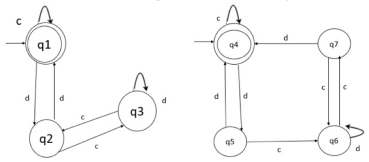
(R = q0, P = 1(1 + 110)* + (00 + 010) + 0, Q = ε)

$q_0 = [1(1 + 110)^* + (00 + 010) + 0]^*$

$q_3 = 01q_1 = 1q_0(1 + 110)^* 01$

$q_3 = 1[1(1 + 110)^* + (00 + 010) + 0]^*(1 + 110)^* 01$

5. Find whether the given FA are equivalent to each other.



	c	d	
(q_1, q_4)	(q_1, q_4)	(q_2, q_5)	✓
(q_2, q_5)	(q_3, q_6)	(q_1, q_4)	✓
(q_3, q_6)	(q_2, q_7)	(q_3, q_6)	✓
(q_2, q_7)	(q_3, q_6)	(q_1, q_4)	✓

In. = In.
Fin. = Fin.

The 2 FAs are equivalent to each other.