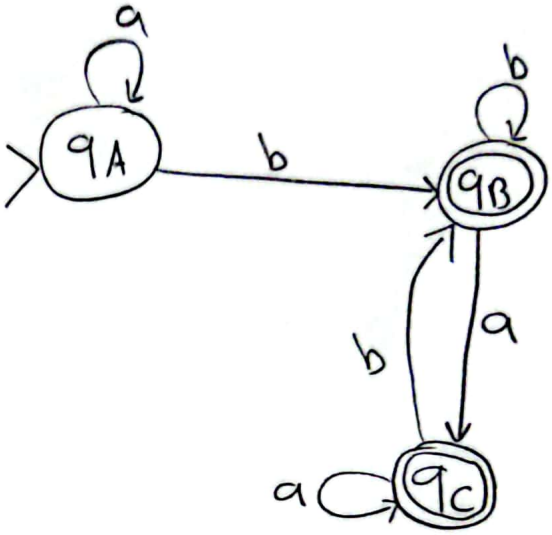
Malek Alismail /20253833

2.2.9

a. $E(q_0) = \{q_0, q_1\}$ / $E(q_1) = \{q_1\}$ / $E(q_2) = \{q_2\}$

$E(q_3) = \{q_3, q_4\}$ / $E(q_4) = \{q_4\}$



- $s' = E(q_0) = \{q_0, q_1\} \leftarrow q_A$

$\delta'(s', a) = E(q_0)$ kendisi

$\delta'(s', b) = E(q_0) \cup E(q_2) \cup E(q_4)$

$= \{q_0, q_1, q_2, q_4\} \leftarrow q_B$

- $\delta'(q_B, a) = E(q_0) \cup E(q_3)$

$= \{q_0, q_1, q_3, q_4\} \leftarrow q_C$

$S = q_A$

$F = q_B, q_C$

$\delta'(q_B, b) = E(q_0) \cup E(q_2) \cup E(q_4)$

kendisi

- $\delta'(q_C, a) = E(q_0) \cup E(q_3)$

kendisi

$\delta'(q_C, b) = E(q_0) \cup E(q_2) \cup E(q_4)$

$= \{q_0, q_1, q_2, q_4\} = q_B$

b. $E(q_0) = \{q_0\}$ / $E(q_1) = \{q_1\}$ / $E(q_2) = \{q_2\}$ / $E(q_3) = \{q_3\}$

$E(q_4) = \{q_4\}$

- $s' = E(q_0) = \{q_0\} \leftarrow q_A$

$\delta'(s', a) = E(q_3) = \{q_3\} \leftarrow q_B$

$\delta'(s', b) = E(q_1) = \{q_1\} \leftarrow q_C$

- $\delta'(q_B, a) = E(q_4) = \{q_4\} \leftarrow q_D$

$\delta'(q_B, b) = 0 \leftarrow q_E$ (Dead state)

- $\delta'(q_C, a) = 0$

$\delta'(q_C, b) = E(q_2) = \{q_2\} \leftarrow q_F$

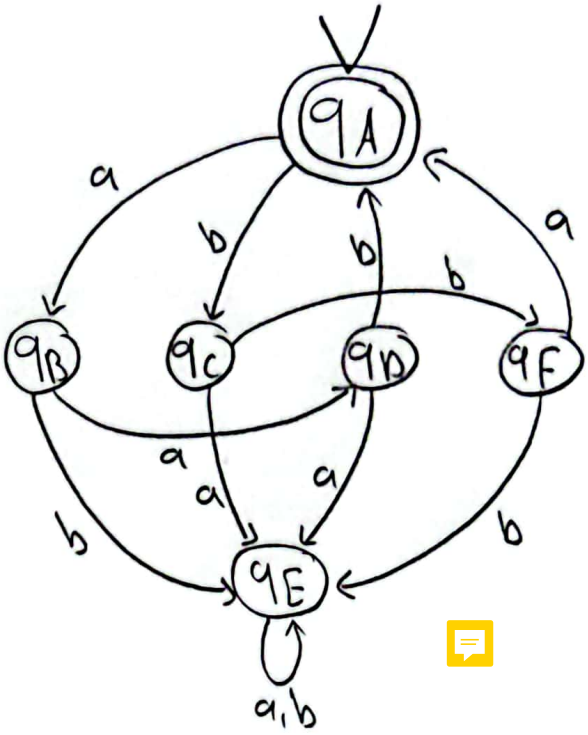
- $\delta'(q_D, a) = 0$

$\delta'(q_D, b) = E(q_0) = \{q_0\}$

- $\delta'(q_E, a) = \delta'(q_E, b) = 0$

- $\delta'(q_F, a) = E(q_0) = \{q_0\}$

$\delta'(q_F, b) = 0$

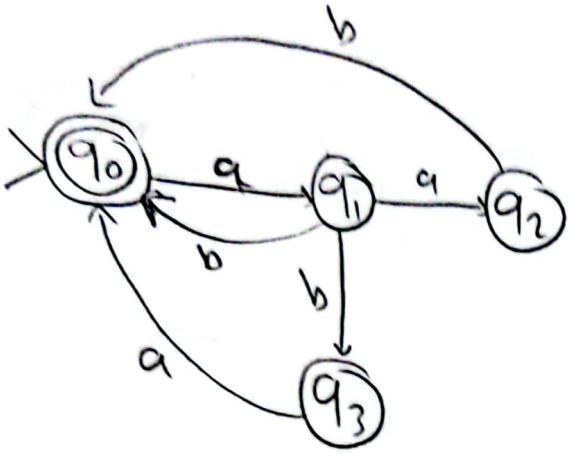


$S = q_A$

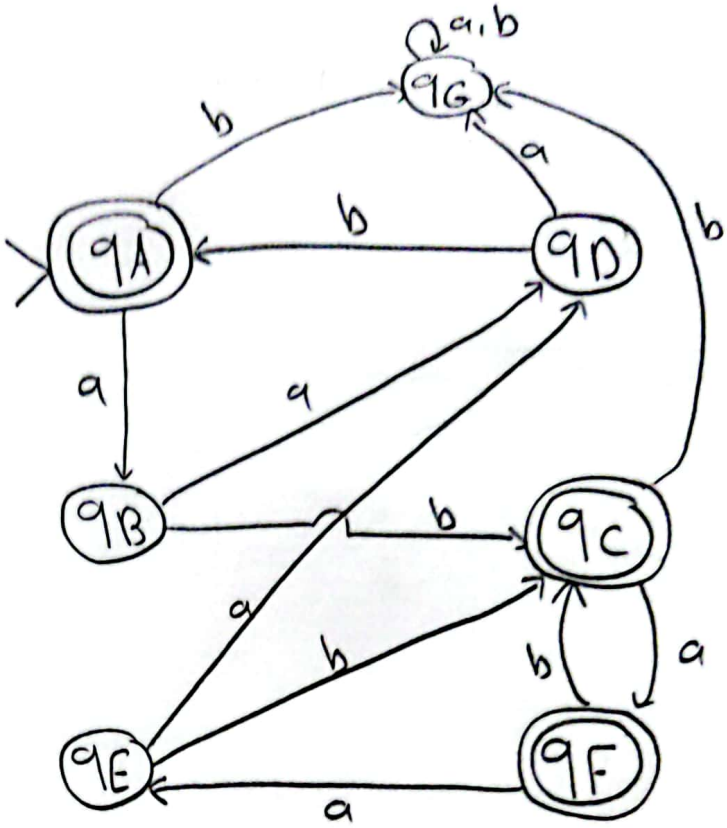
$F = q_A$

2.2.6

NFA



DFA



- NFA' dan her E(s) = s' tir.

- $q_A = \{q_0\}$ / $q_B = \{q_1\}$ / $q_C = \{q_0, q_3\}$ / $q_D = \{q_2\}$

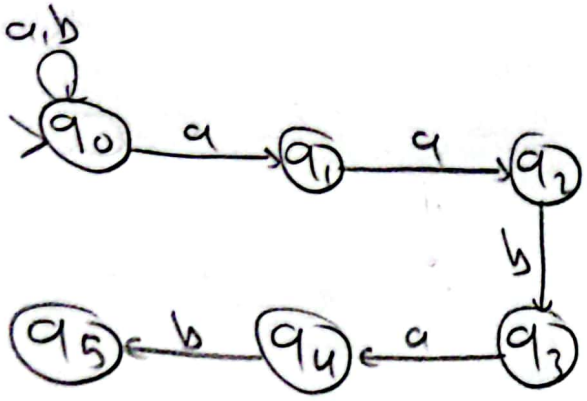
  $q_E = \{q_1, q_2\}$ / $q_F = \{q_0, q_1\}$ / $q_G = \{\}$ (Dead state)

- $S = q_A = \{q_0\}$

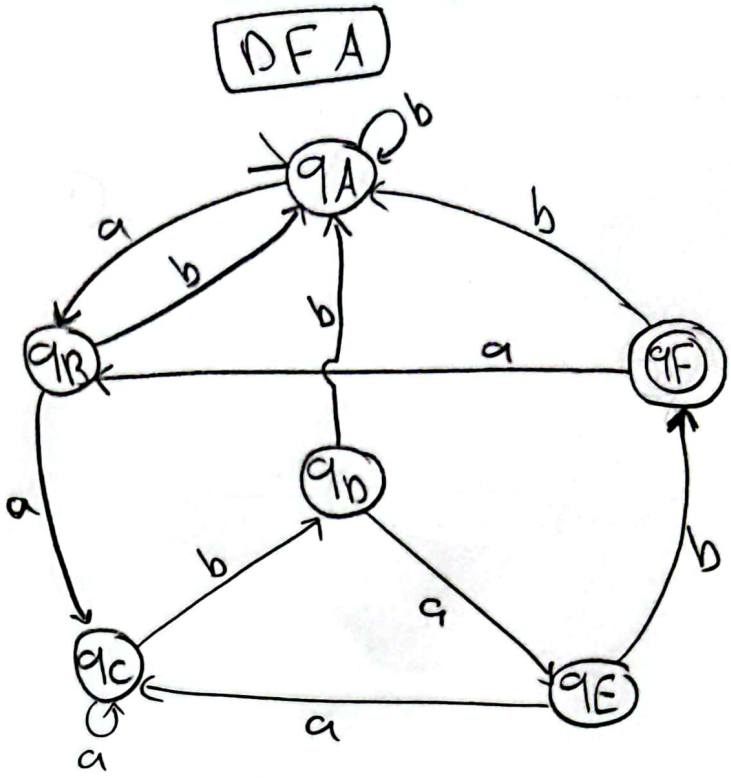
  $F = \{q_A, q_C, q_F\}$

2.2.7

NFA



DFA



- NFA'dan her E(s) = s 'tir.

$q_A = \{q_0\}$ / $q_B = \{q_0, q_1\}$ / $q_C = \{q_0, q_1, q_2\}$ / $q_D = \{q_0, q_3\}$

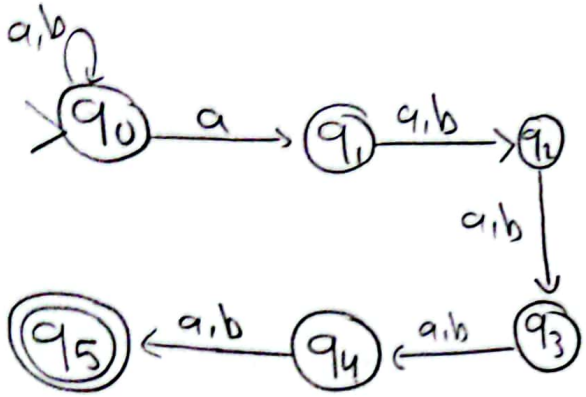
$q_E = \{q_0, q_1, q_4\}$ / $q_F = \{q_0, q_5\}$

- $S = q_A = \{q_0\}$

$F = q_F = \{q_0, q_5\}$

2.2 8

NFA

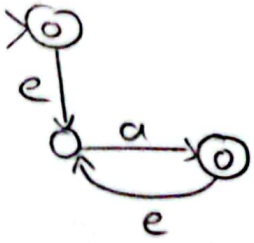


DFA

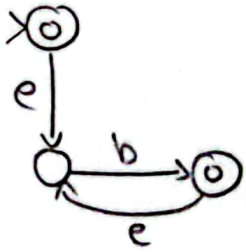
- 32 durum çıkıyor,
  0–15 accept state değil,
  16–31 accept state'tir.
- $S = q_0$
  $F = \{q_{16} \text{ --- } q_{31}\}$

2.3.4

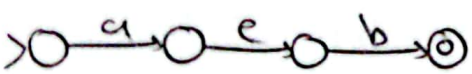
a)



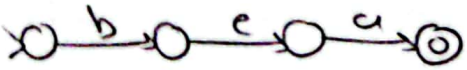
a*



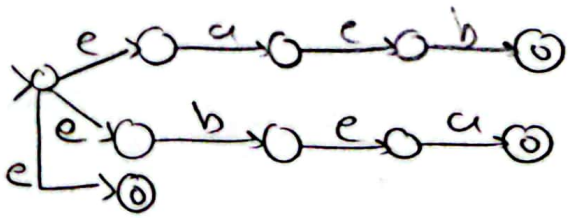
b*



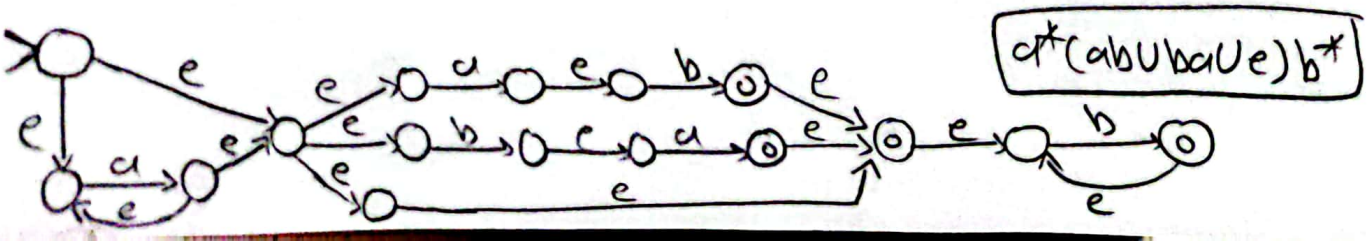
ab



ba



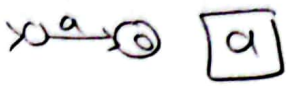
(abUbaUe)

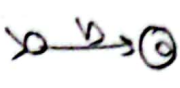


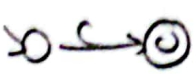
a*(abUbaUe)b*

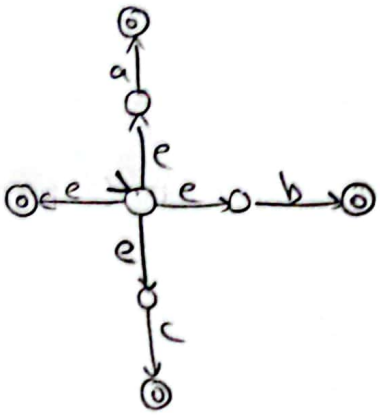
b) $((a \cup b)^*(e \cup c)^*)^* = ((a \cup b) \cup (e \cup c))^*$

$= (a \cup b \cup c \cup e)^*$

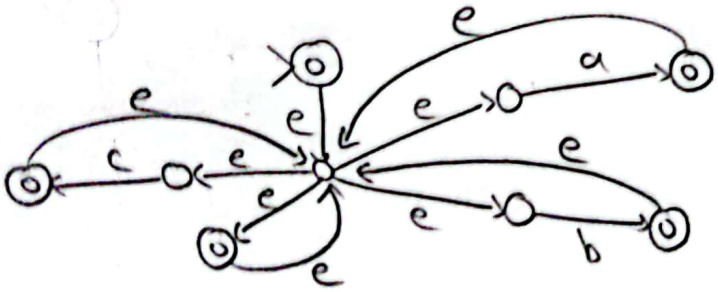




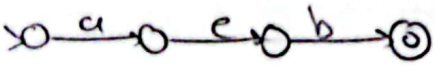




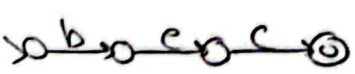
$(a \cup b \cup c \cup e)$



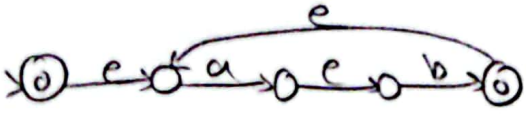
$(a \cup b \cup c \cup e)^*$

c) 

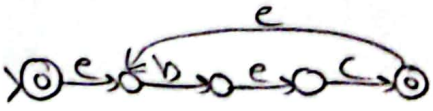
ab



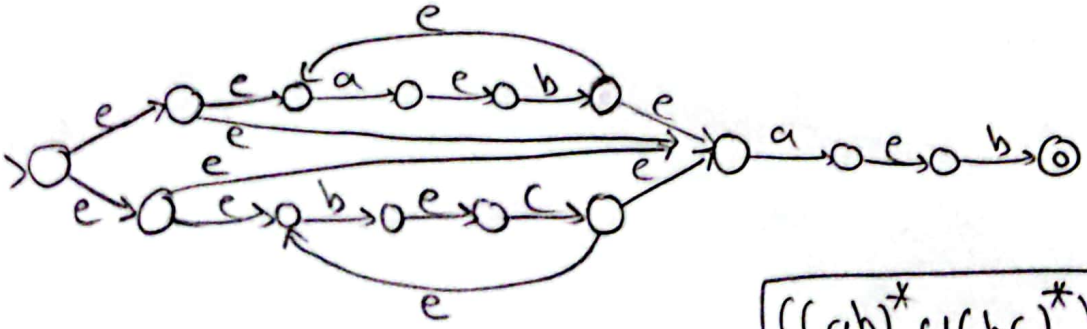
bc



ab^*



bc^*



$((ab)^* \cup (bc)^*)ab$

2.3.7

a) $a^* b (a \cup ba^* b)^*$

b) $(b(a \cup b) \cup a(a \cup b))^* = ((a \cup b)(a \cup b))^*$

c) $(a \cup b)^* abaa (a \cup b)^*$

d) ~~$(a \cup b)^* (ab \cup bab) (a \cup b)^*$~~