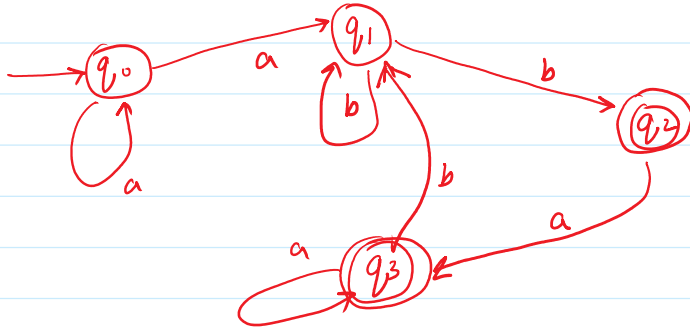


lec 21 = Session Exam.

lec 12:- NFA To DFA Conversion.

CASE 1:- We do not have a Null transition.



Λ = Transition.

ϕ = A Null state.

old State

$z_1^- \equiv q_0$
 $z_2 \equiv (q_0, q_1)$

$z_4^+ \equiv (q_2, q_2)$

$z_5^+ \equiv q_3$

$z_6 \equiv q_1$

Transition at 'a'

$(q_0, q_1) \equiv z_2$

$(q_0, q_1, \phi) \equiv z_2$

$(\phi, q_3) \equiv z_5^+$

$q_3 \equiv z_5^+$

$\phi \equiv z_3$

Transition at 'b'

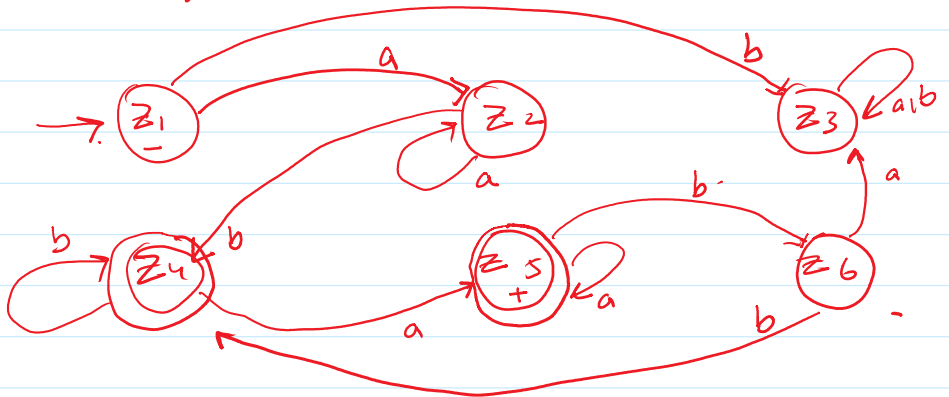
$\phi \equiv z_3$

$(\phi, q_1, q_2) \equiv z_4^+$

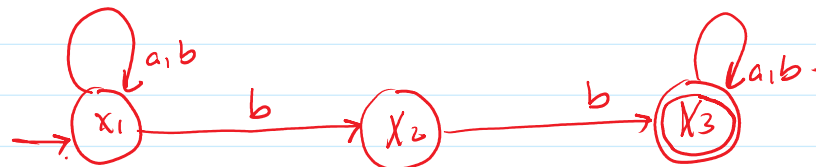
$(q_1, q_2, \phi) \equiv z_4^+$

$q_1 \equiv z_6$

$(q_1, q_2) \equiv z_4^+$



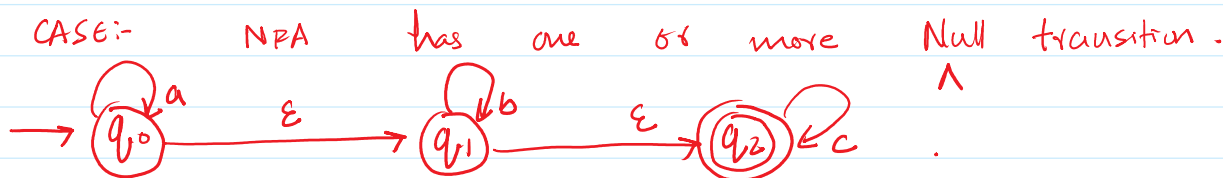
HW:-



NFA to DFA.

NFA To DFA

E



ϵ -NFA	a	b	c	ϵ
q_0	$\{q_0\}$	\emptyset	\emptyset	$\{q_1\}$
q_1	\emptyset	$\{q_1\}$	\emptyset	$\{q_2\}$
q_2	\emptyset	\emptyset	$\{q_2\}$	\emptyset

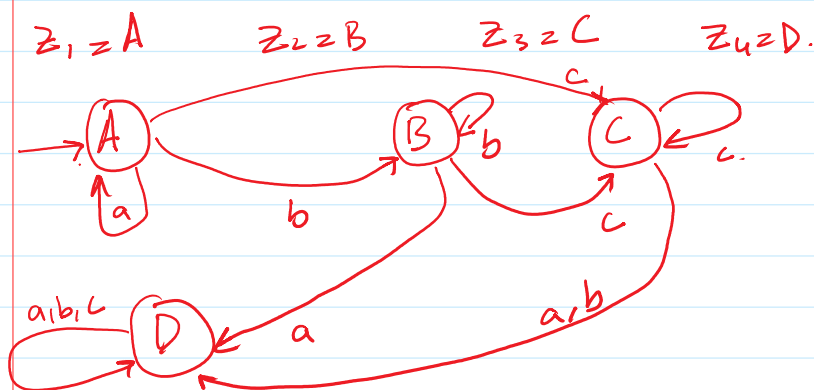
$$\begin{aligned} \epsilon\text{-closure}(q_0) &= \{q_0, q_1, q_2\} \\ \epsilon\text{-closure}(q_1) &= \{q_1, q_2\} \\ \epsilon\text{-closure}(q_2) &= \{q_2\} \end{aligned}$$

$\delta^+(q_0, a) = \{q_0, q_1, q_2\}$ $\delta^+(q_0, b) = \emptyset$ $\delta^+(q_0, c) = \emptyset$

$\delta^+(q_1, a) = \emptyset$ $\delta^+(q_1, b) = \{q_1, q_2\}$ $\delta^+(q_1, c) = \emptyset$

$\delta^+(q_2, a) = \emptyset$ $\delta^+(q_2, b) = \emptyset$ $\delta^+(q_2, c) = \{q_2\}$

$$\begin{aligned} \delta(\{q_0, q_1, q_2\}, a) &= \epsilon\text{-closure}(\delta_E(q_0, a), \delta_E(q_1, a), \delta_E(q_2, a)) \\ &= \epsilon\text{-closure}(\{q_0, q_1, q_2\} \cup \emptyset \cup \emptyset) \\ &= \epsilon\text{-closure}(\{q_0, q_1, q_2\}) \\ &= \{q_0, q_1, q_2\} \end{aligned}$$

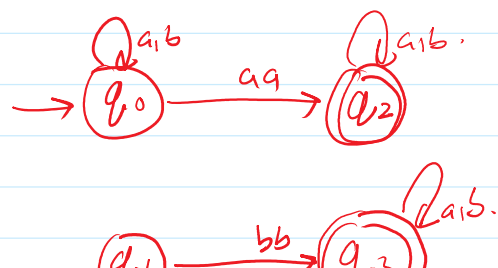
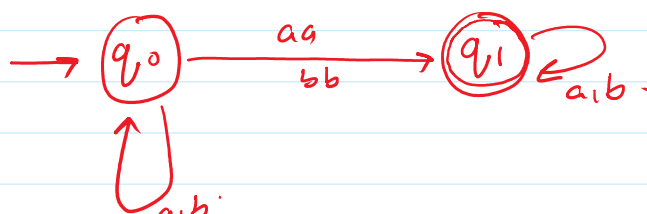


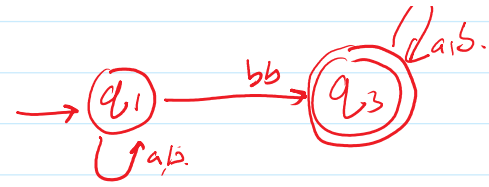
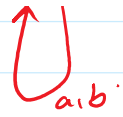
$$\begin{aligned} &= \epsilon\text{-closure}(\{q_0\} \cup \emptyset \cup \emptyset) \\ &= \epsilon\text{-closure}(\{q_0\}) \\ &= \{q_0, q_1, q_2\} \end{aligned}$$

$$\begin{aligned} \delta(\{q_0, q_1, q_2\}, b) &= \epsilon\text{-closure}(\delta_E(q_0, b), \delta_E(q_1, b), \delta_E(q_2, b)) \\ &= \epsilon\text{-closure}(\emptyset \cup \{q_1\} \cup \emptyset) \\ &= \epsilon\text{-closure}(q_1) \\ &= \{q_1, q_2\} \end{aligned}$$

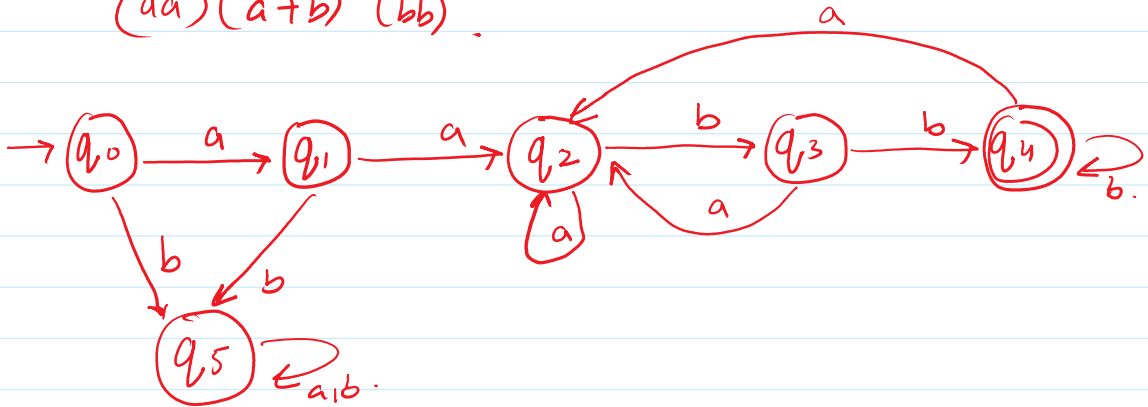
Sessional 1.

1). $(a+b)^* (aa+bb) (a+b)^*$

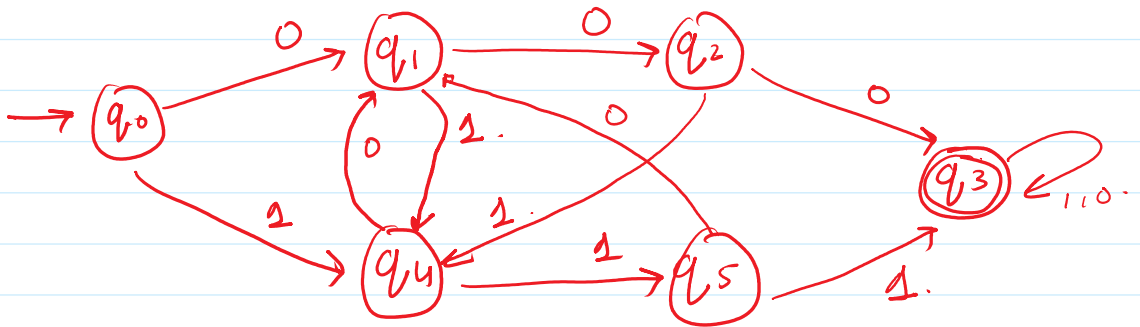




3) $(aa)(a+b)^*(bb)$

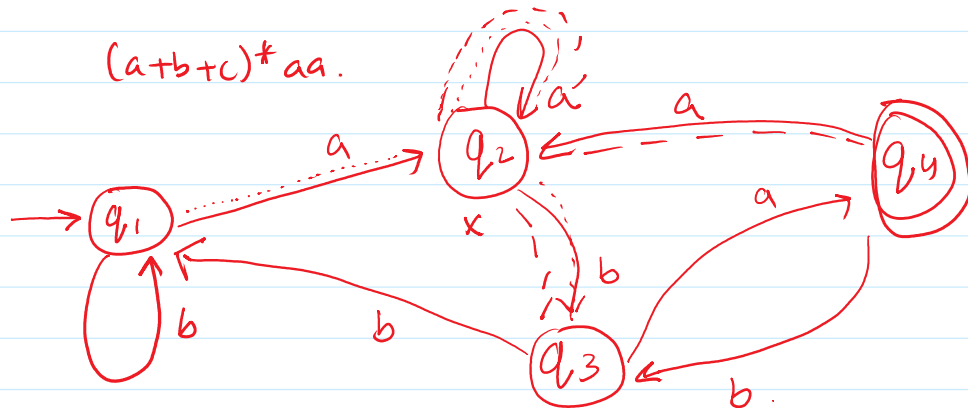


4) 000 or 111



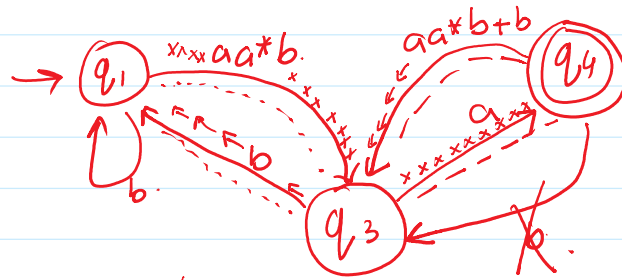
5- $(a+b+c)^*aa$

2--



.... aa^*b

----- aa^*b



$\cdots aa^*bb.$
 $---- (aa^*b+tb)a.$
 $xxxxx$

