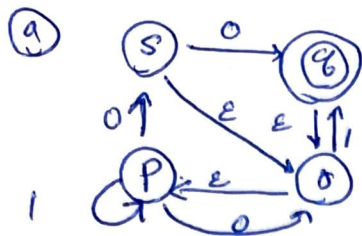
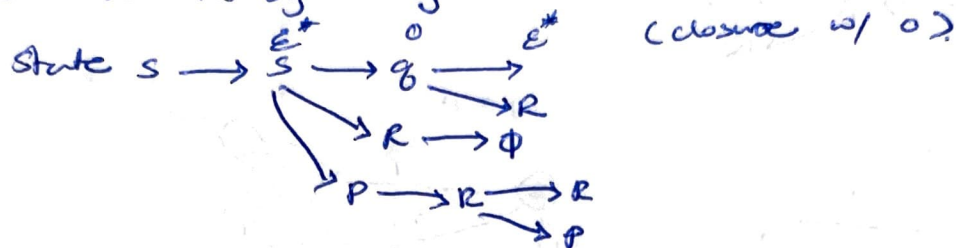


Assignment 2

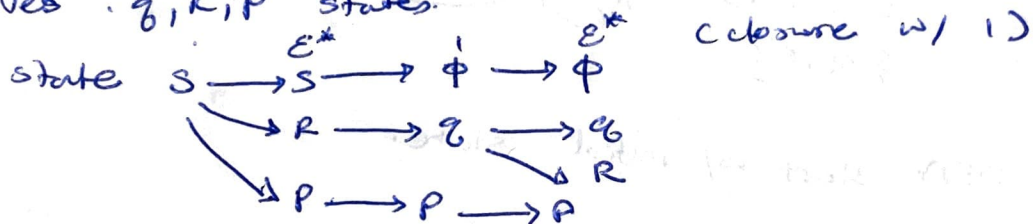


convert to NFA by finding ϵ closure.



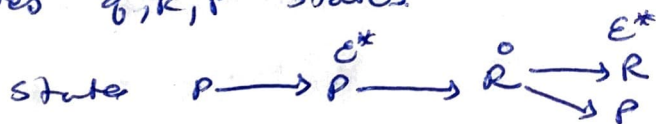
Hence ϵ closure of 0 on S

gives q, R, P states.

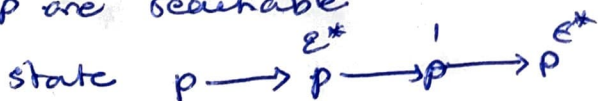


Hence ϵ closure of 1 on S.

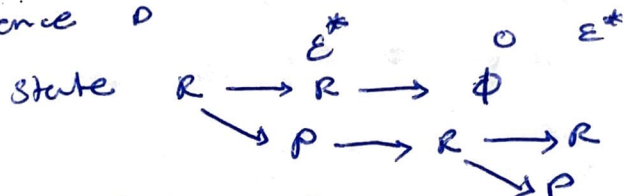
gives q, R, P states.



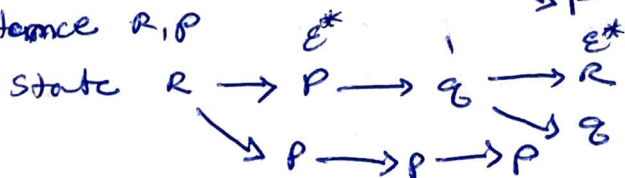
R, P are reachable



Hence P



Hence R, P



Hence (q, r, p)

State $Q \xrightarrow{E^*} Q \xrightarrow{0} Q \xrightarrow{E^*} Q$
 $\quad \quad \quad \searrow \quad \quad \quad \searrow \quad \quad \quad \searrow$
 $\quad \quad \quad R \rightarrow \phi \quad \quad \quad R \rightarrow \phi \quad \quad \quad R \rightarrow \phi$

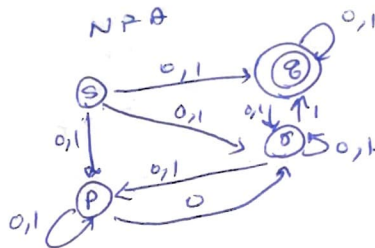
Hence Q, R .

State $Q \xrightarrow{E^*} Q \xrightarrow{1} \phi \xrightarrow{E^*} Q$
 $\quad \quad \quad \searrow \quad \quad \quad \searrow \quad \quad \quad \searrow$
 $\quad \quad \quad R \rightarrow \phi \quad \quad \quad R \rightarrow \phi \quad \quad \quad R \rightarrow \phi$

Hence Q, R .

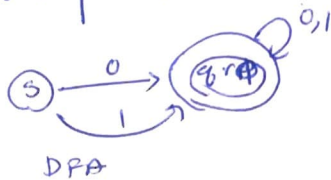
Transition table

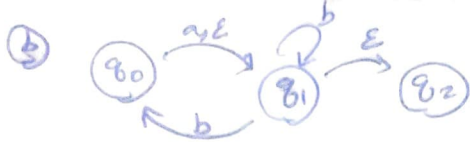
	0	1
S	$\{q, r, p\}$	$\{q, r, p\}$
P	$\{r, p\}$	$\{p\}$
r	$\{r, p\}$	$\{q, r, \phi\}$
q	$\{q, r\}$	$\{q, r\}$



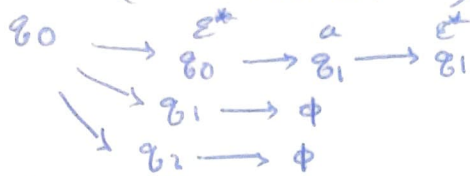
CONVERT TO DFA start w/ initial state.

	0	1
S	$(q \cup \phi)$	$(r \cup p)$
$(q \cup \phi)$	$(q \cup \phi)$	$(q \cup \phi)$

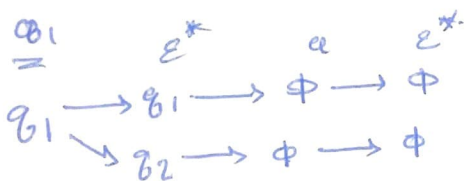
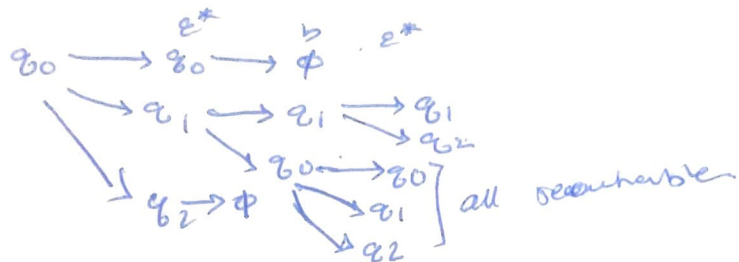




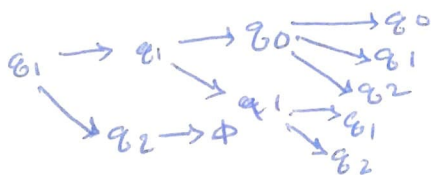
• (E closure on a)



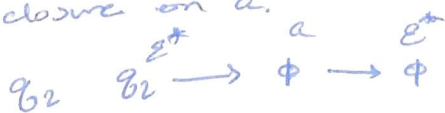
C_2 appears on $b)$



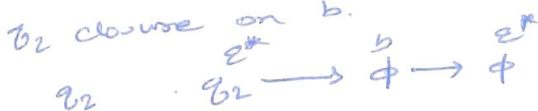
closure on b.



q_2 closure on a .



b_2 closure on b .



Transition table

	a	b
g_0	$\{g_1, g_2\}$	$\{g_0, g_1, g_2\}$
g_1	$\{\phi\}$	$\{g_0, g_1, g_2\}$
g_2	$\{\phi\}$	$\{\phi\}$



NFA to DFA

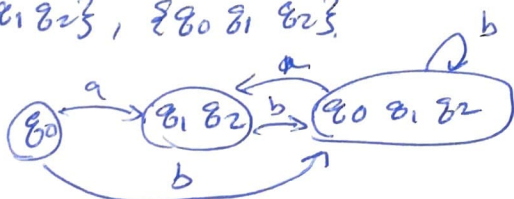
Conversion table from NFA to DFA.

	a	b
q_0	$\{q_1, q_2\}$	$\{q_0, q_1, q_2\}$
$\{q_1, q_2\}$	$\{q_0\}$	$\{q_0, q_1, q_2\}$
$\{q_0, q_1, q_2\}$	$\{q_1, q_2\}$	$\{q_0, q_1, q_2\}$

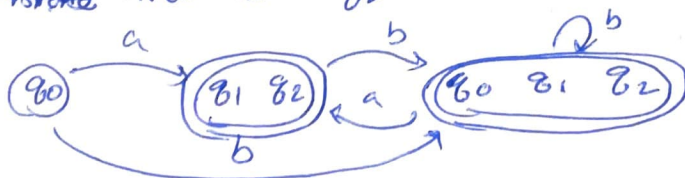
have only 3 states.

$\{q_0\}$, $\{q_1, q_2\}$, $\{q_0, q_1, q_2\}$

DFA.



~~any state~~ final state q_2 is the final state



② L_1 corresponds to strings ending with ab

L_2 corresponds to strings having atleast two b 's.

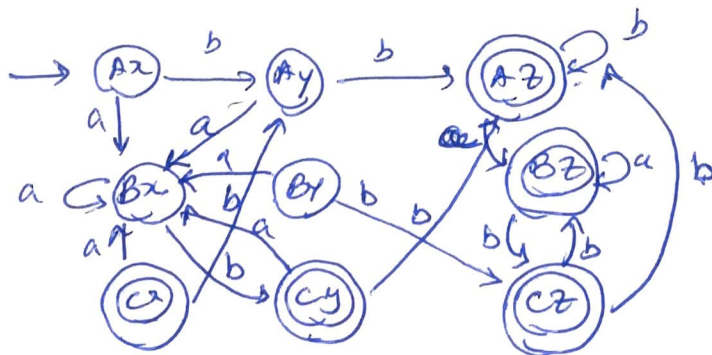
Transition table

	A	B	C
a	B	B	B
b	A	C	A

	x	y	z
a	x	x	z
b	y	z	z

$L_1 \cup L_2$

	Ax	Ay	Az	Bx	By	Bz	Cx	Cy	Cz
a	Bx	Bx	Bz	Bx	Bx	Bz	Bx	Bx	Bz
b	Ay	Az	Az	Cy	Cz	Cz	Ay	Az	Az

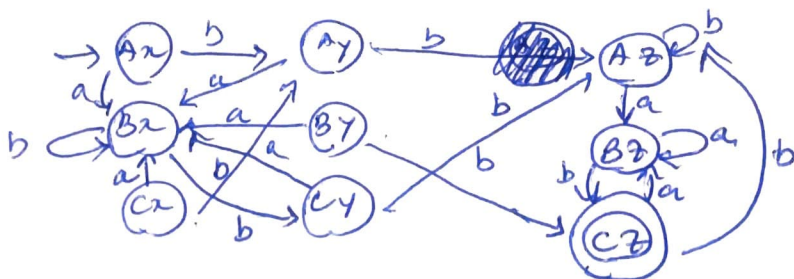


Start state: Ax

Final states: Az, Bz, Cz, Cy, Ax

$L_1 \cap L_2$

	Ax	Ay	Az	Bx	By	Bz	Cx	Cy	Cz
a	Bx	Bx	Bz	Bx	Bx	Bz	Bx	Bx	Bz
b	Ay	Az	Az	Cy	Cz	Cz	Ay	Az	Az



Start state: Ax

Final state: Cz