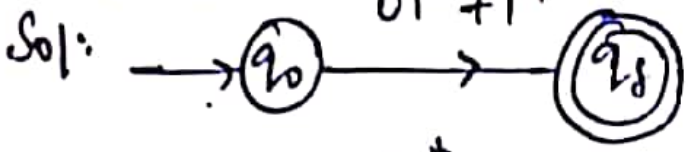
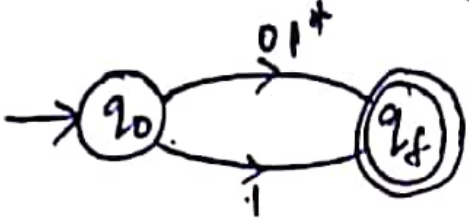
1. Convert RE $01^* + 1$ to FA.

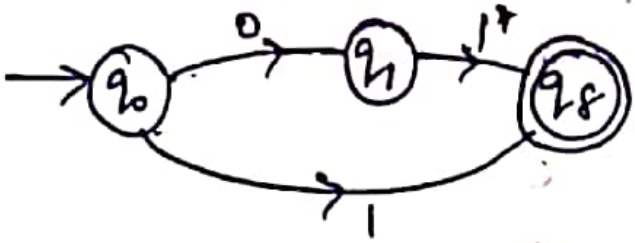
1. Conversion of RE to NFA-ϵ:

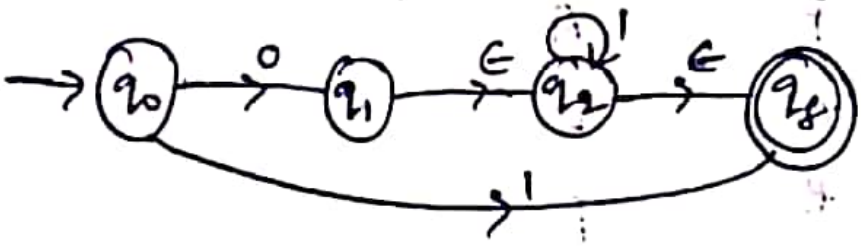
$01^* + 1$

Sol:









2. Conversion of NFA-ϵ to NFA.

NFA-ϵ TT

δ	0	1	ϵ
q_0	q_1	q_f	ϕ
q_1	ϕ	ϕ	q_2
q_2	ϕ	q_2	q_f
*q_f	ϕ	ϕ	ϕ

ϵ-closure$(q_0) = q_0$

ϵ-closure$(q_1) = q_1, q_2, q_f$

ϵ-closure$(q_2) = q_2, q_f$

ϵ-closure$(q_f) = q_f$

$\delta'(q_0, 0)$ ϵ^* 0 ϵ^*

$q_0 - q_0 - q_1$ (q_1, q_2, q_f)

$\delta'(q_0, 1)$ ϵ^* 1 ϵ^*

$q_0 - q_0 - q_f - (q_f)$

$\delta'(q_1, 0)$ ϵ^* 0 ϵ^*

$q_1 - \phi - \phi$

$q_2 - \phi - \phi$

$q_f - \phi - \phi$

$\delta'(q_1, 1)$ ϵ^* 1 ϵ^*

$q_1 - \phi$

$q_2 - q_2$

$q_f - \phi$

(q_2, q_f)

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$\delta'(q_2, 0)\ \epsilon^* \underline{0}\ \epsilon^*$

$q_2 < q_2 - \phi - \phi$

$q_f - \phi - \phi$

$\delta'(q_2, 1)\ \epsilon^* \underline{1}\ \epsilon^*$

$q_2 < q_2 - q_2 < q_2, q_f$

$q_1 - \phi$

$\delta'(q_f, 0)\ \epsilon^* \underline{0}\ \epsilon^*$

$q_f - q_f - \phi - \phi$

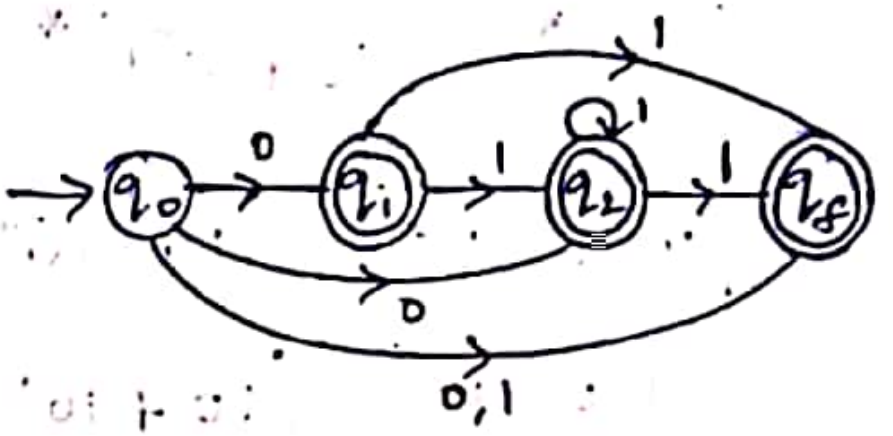
$\delta'(q_f, 1)\ \epsilon^* \underline{1}\ \epsilon^*$

$q_f - q_f - \phi - \phi$

NFA - TT

δ'	0	1
q_0	$\{q_0 q_1 q_2 q_f\}$	$\{q_f\}$
* q_1	$\{\phi\}$	$\{q_2 q_f\}$
* q_2	$\{\phi\}$	$\{q_2 q_f\}$
* q_f	$\{\phi\}$	$\{\phi\}$

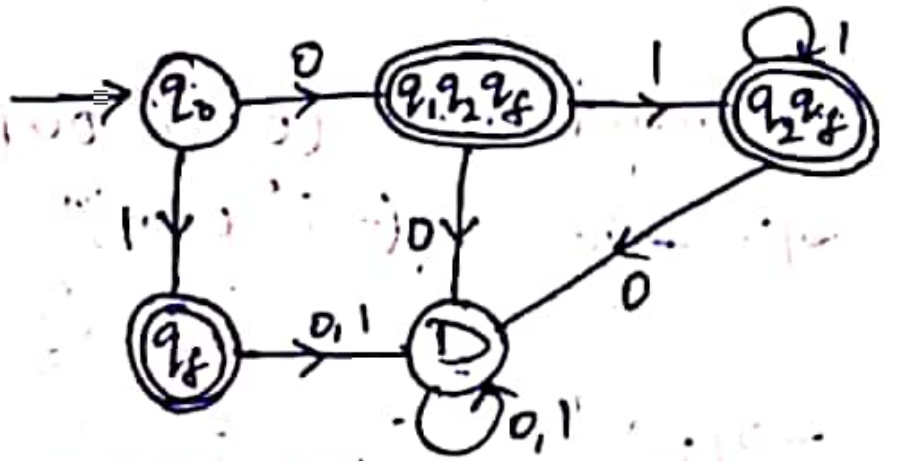
NFA



DFA - TT

δ''	0	1
q_0	$\{q_0 q_1 q_2 q_f\}$	$\{q_f\}$
* $q_0 q_1 q_2 q_f$	$\{D\}$	$\{q_2 q_f\}$
* q_f	$\{D\}$	$\{D\}$
* $q_2 q_f$	$\{D\}$	$\{q_2 q_f\}$
D	D	D

DFA



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