Lecture 4

Epsilon (ε) – NFA

- ε → empty symbols

↳ $\{Q, \Sigma, q_0, f, \delta\}$

↓

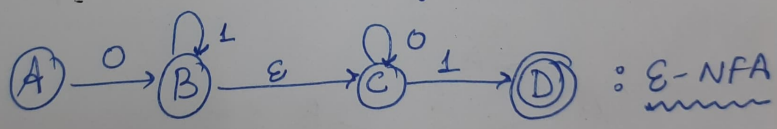
only this is different.

$Q \times \Sigma \cup \varepsilon \rightarrow 2^Q$

↓

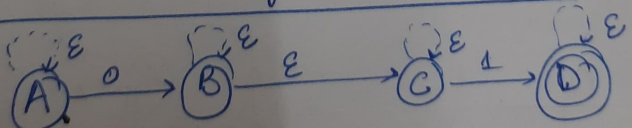
State on seeing nothing or empty symbol can go to 2^Q.

eg:-



: ε-NFA

** Every state on ε goes to itself



Faculty name
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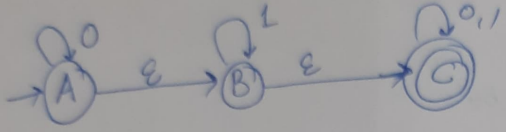
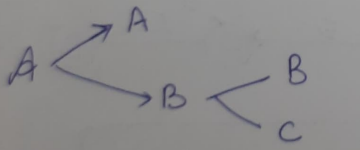
Conversion of ε-NFA ⟶ NFA :



Rule: (i) for each state that we have, check where this state goes on ε^* and so on.

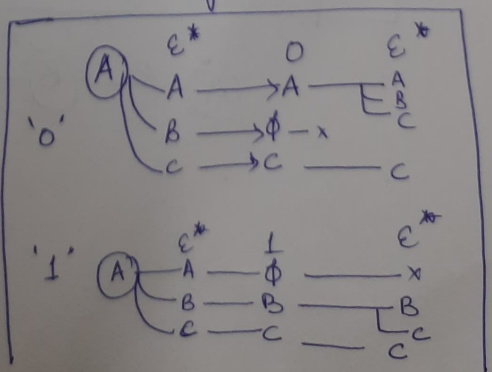
↓

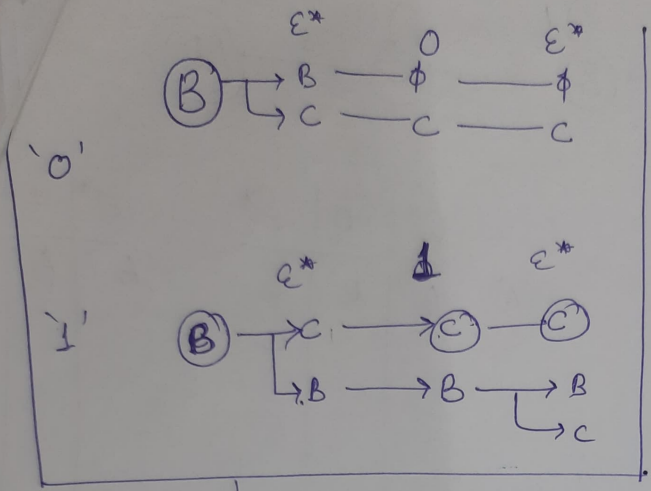
All the states that can be reached from a particular state only by seeing the ε symbol.

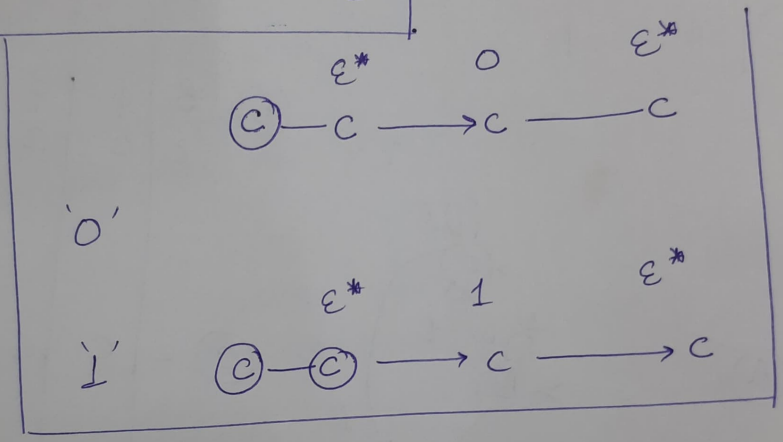


∴ A → B → C ∴ (ε^* of A) = ABC

Q \ Σ	0	1
→ A	{A, B, C}	{B, C}
B	C	{B, C}
(C)	C	C

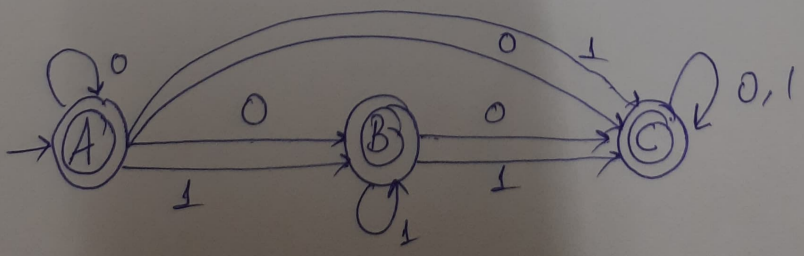




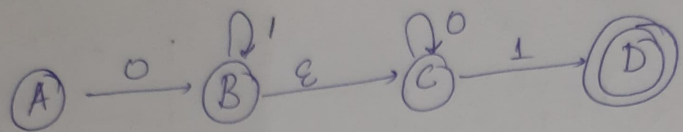


** Final state will be any state that can reach the final state only by seeing ε.

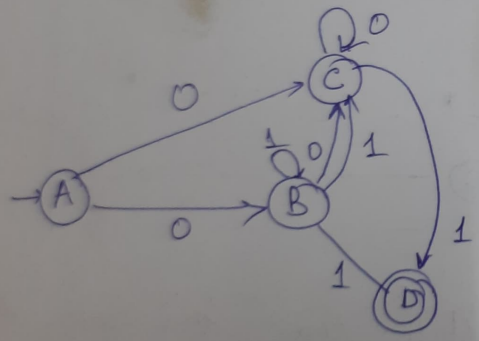
∴ A, B & C are all final state.



rg2 :



	0	1
→A	B, C	ϕ
B	C	B, C, D
C	C	D
D	ϕ	ϕ



	ε*	0	ε*
A	A	B	B C
B	B C	ϕ C	ϕ C
C	C	C	C
D	D	ϕ	ϕ

ε*	1	ε
A	A	ϕ
B C	B D	B C D
C	D	D
D	ϕ	ϕ

sion - exa

foll

)

ansa

→

e

$q_3 = q_2 a$

↓ eq(v)

$\Rightarrow q_1 a (b+ab)^* a$

↓ eq(vi)

$q_3 \Rightarrow (a + a(b+ab)^* b)^* a (b+ab)^* a$

Now all are in input a,b ∴ it is RE.