Lecture 24:-   DFA   to   NFA.
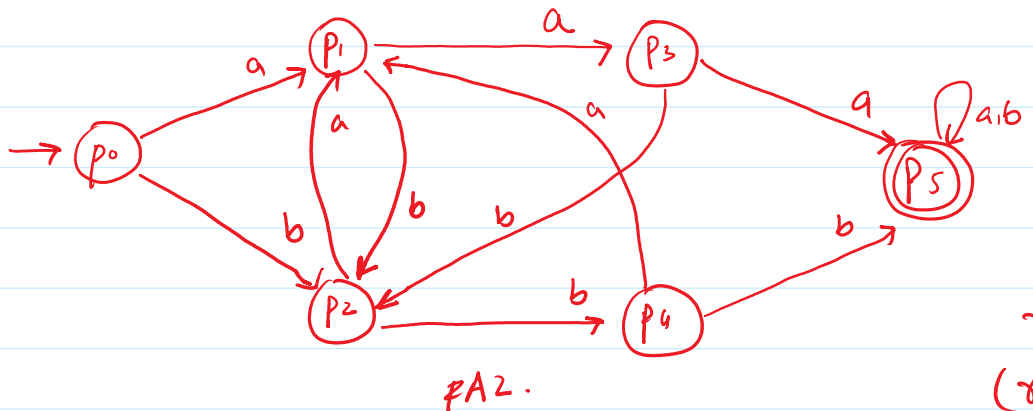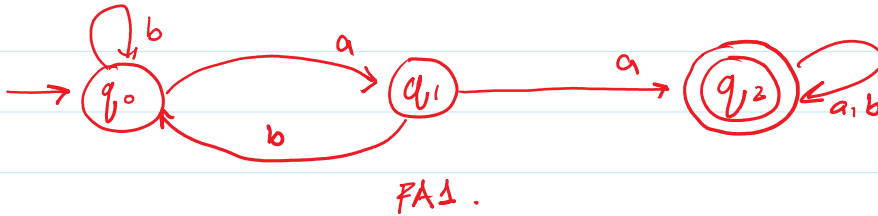   1-. Union.
                        ✓ 2-   Concatenation.
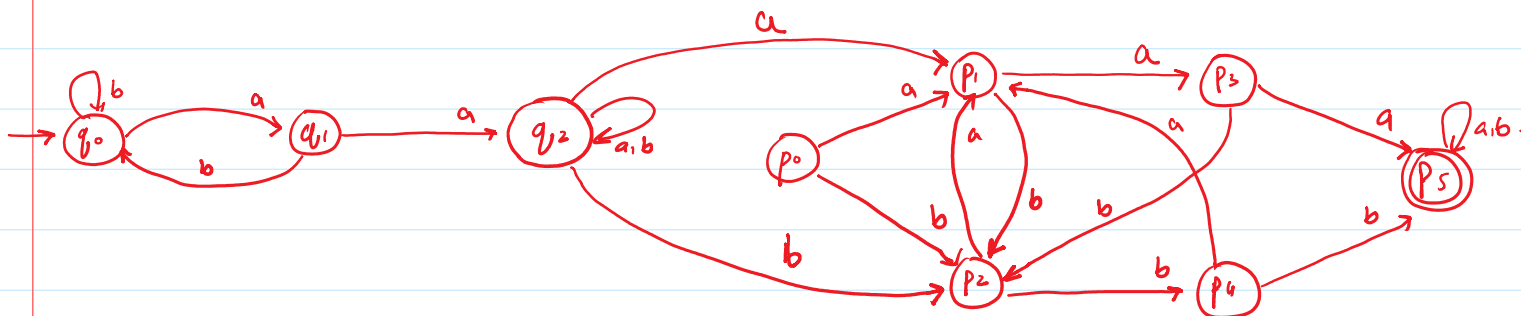   3-   Closure.
Ek.

FA1.

FA2.

$$\gamma_1 \gamma_2 \neq \gamma_2 \gamma_1$$
$$(\gamma_1 + \gamma_2) = (\gamma_2 + \gamma_1)$$

FA1 FA2.

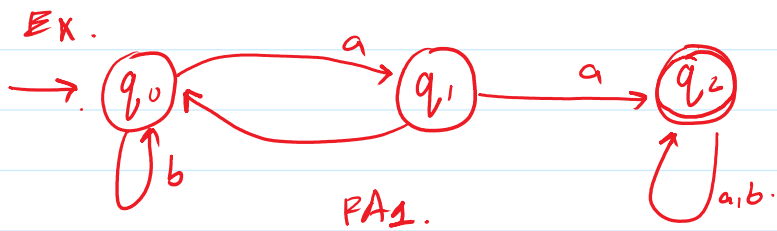Step 1:-   Delete Initial of FA2.
Step 2:-   Delete final   of FA1.
Step 3:-   FA1's final additional transition will same as
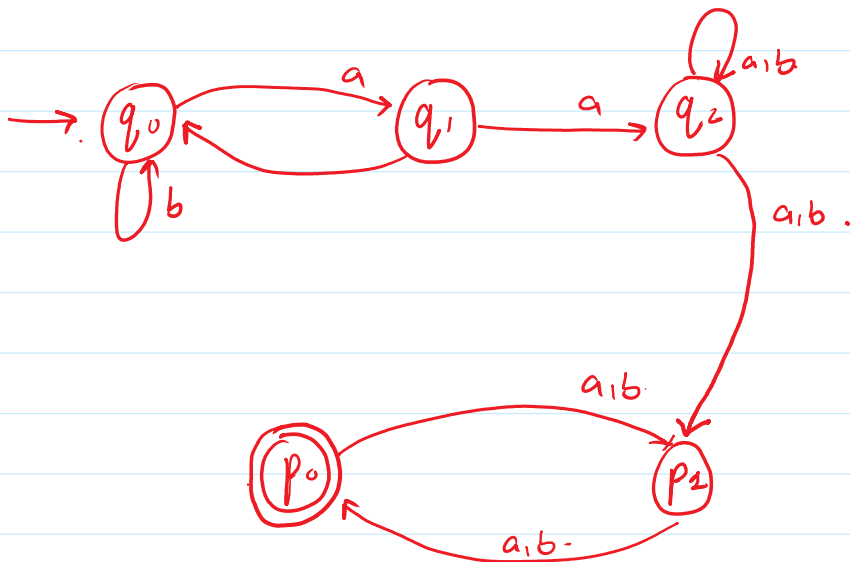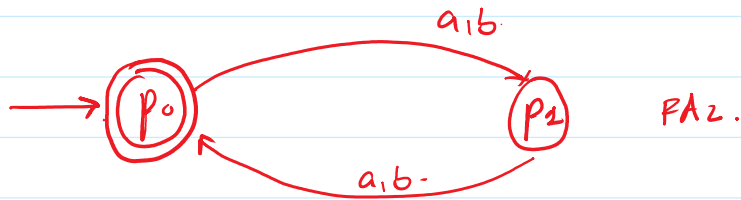   that of FA2's Initial.

Ek.

Null String   λ
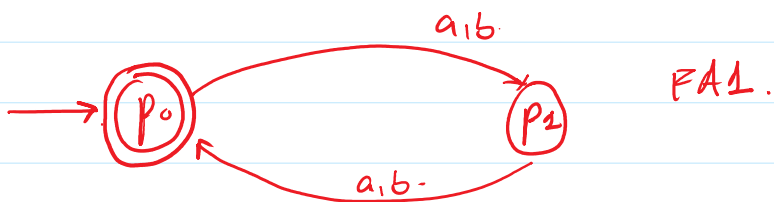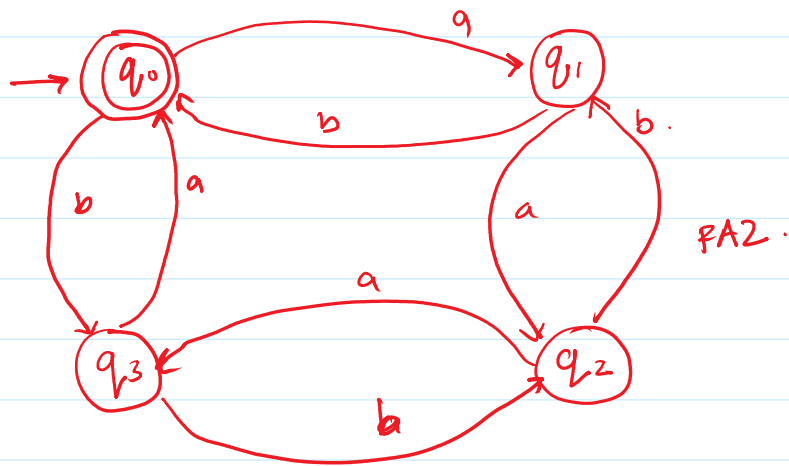
Ex.

FA1.

Null String λ
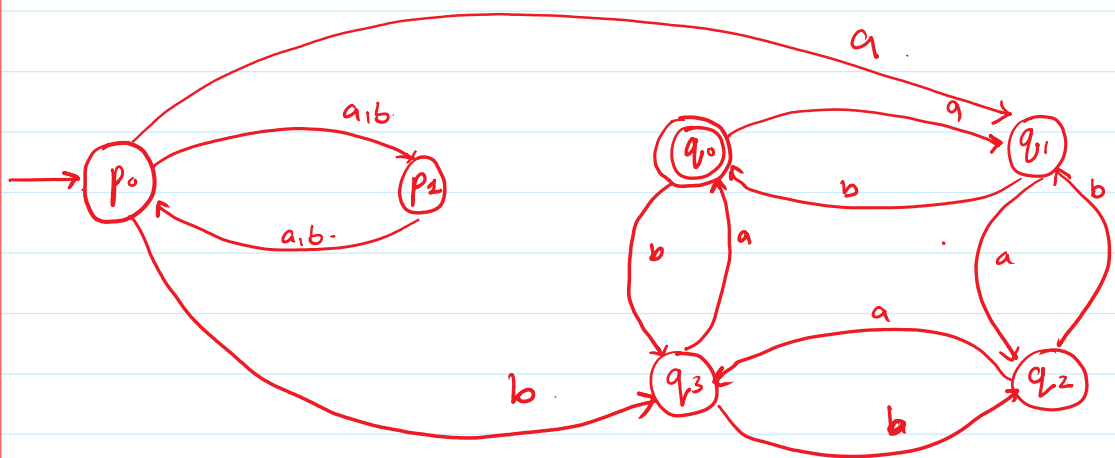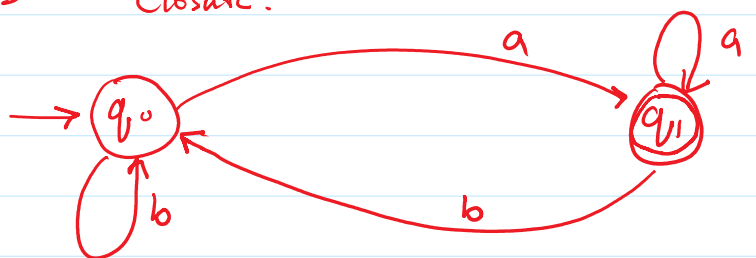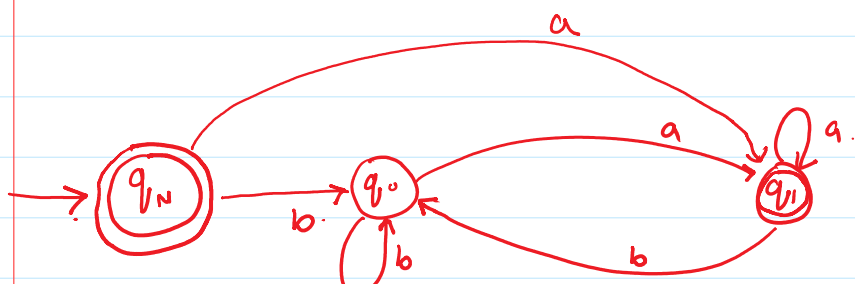Null transition ε, λ
Null State ϕ

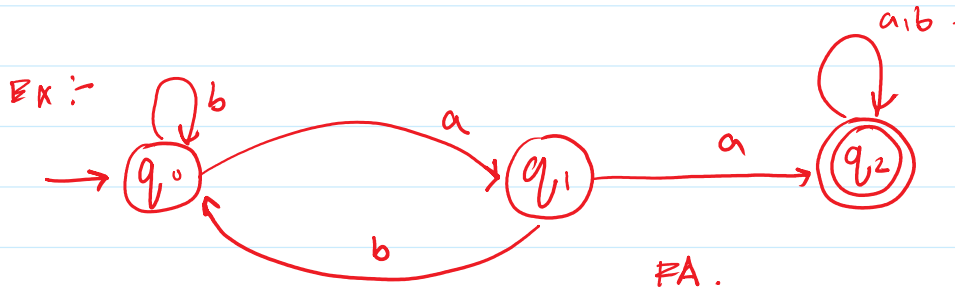FA2.

Ex :-

FA1.

FA2.

DFA to NFA.

1. Union.
2. Cancatenation.
3. Closure.

Ex:-

FA* ?
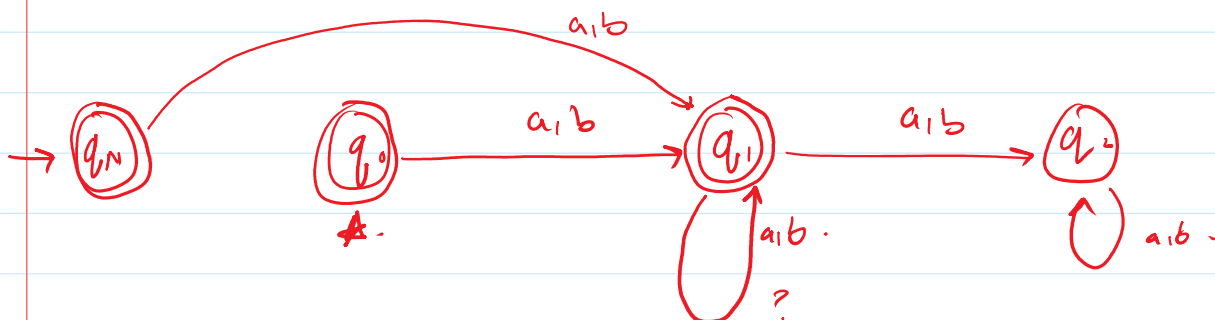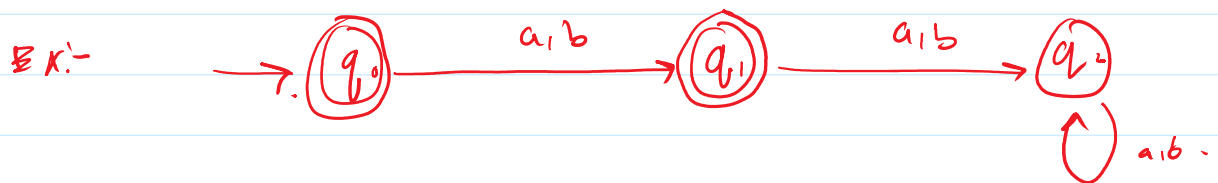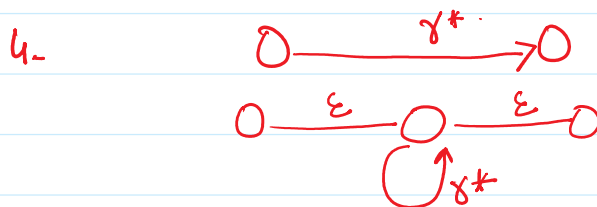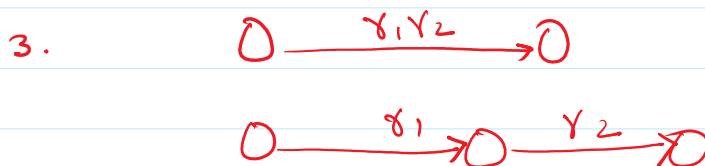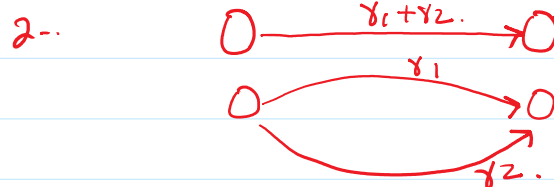
EX :-

FA.
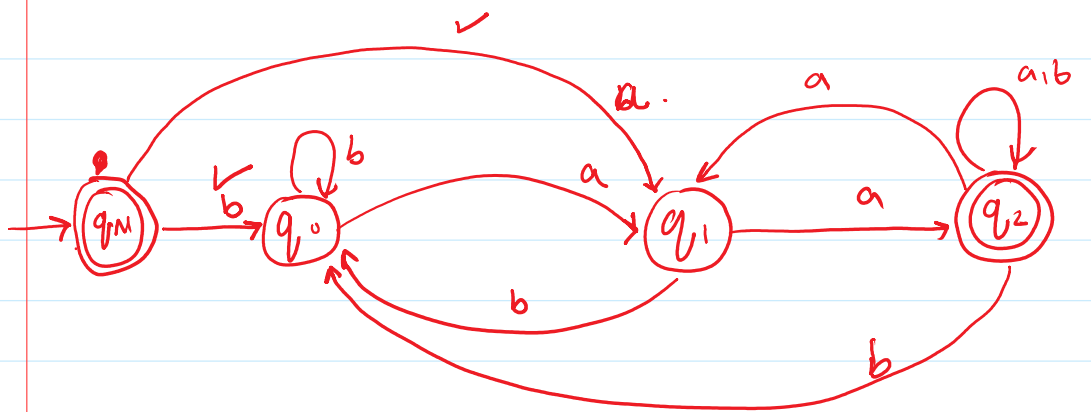
1- Delete Initial.
2- Add State (Declaring it as both Initial & final).
3- Add transition of the added State Equal to previous Initial.
4- Add additional transition for original final Equal to original Initial.
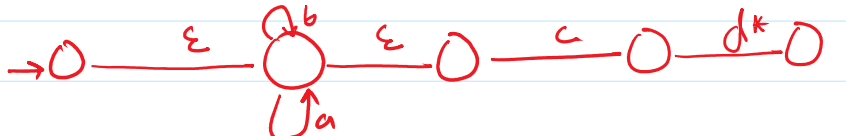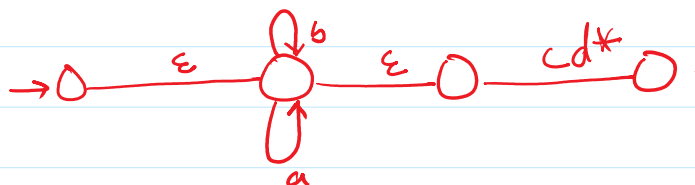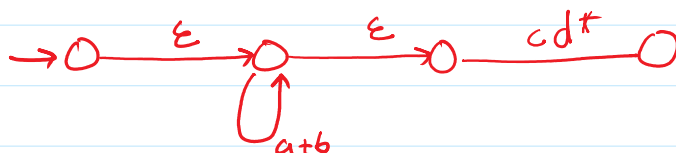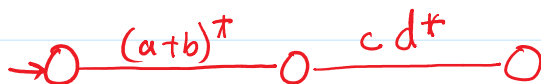
EX :-

?

REGEX To NFA.

1. If ε transition on an Edge so drop.

2.

$\bigcirc \xrightarrow{\gamma_1 + \gamma_2} \bigcirc$

$\bigcirc \xrightarrow{\gamma_1} \bigcirc$
$\bigcirc \xrightarrow{\gamma_2} $

3.

$\bigcirc \xrightarrow{\gamma_1 \gamma_2} \bigcirc$

$\bigcirc \xrightarrow{\gamma_1} \bigcirc \xrightarrow{\gamma_2} \bigcirc$

4.

$\bigcirc \xrightarrow{\gamma^*} \bigcirc$

$\bigcirc \xrightarrow{\varepsilon} \bigcirc \xrightarrow{\varepsilon} \bigcirc$
with self-loop γ^*

$(a+b)^* c d^*$.

$\rightarrow \bigcirc \xrightarrow{(a+b)^* c d^*} \bigcirc$

$\rightarrow \bigcirc \xrightarrow{(a+b)^*} \bigcirc \xrightarrow{c d^*} \bigcirc$

$\rightarrow \bigcirc \xrightarrow{\varepsilon} \bigcirc \xrightarrow{\varepsilon} \bigcirc \xrightarrow{c d^*} \bigcirc$
self-loop $a+b$

$\rightarrow \bigcirc \xrightarrow{\varepsilon} \bigcirc \xrightarrow{\varepsilon} \bigcirc \xrightarrow{c d^*} \bigcirc$
self-loops b, a

$\rightarrow \bigcirc \xrightarrow{\varepsilon} \bigcirc \xrightarrow{\varepsilon} \bigcirc \xrightarrow{c} \bigcirc \xrightarrow{d^*} \bigcirc$
self-loops b, a

"Homework".