lecture 18:-

Sessional 2 (Lec 9 – Lec 18)
10 – 12 Nov. – 2022.

Regular language:-

→ Regular Expression.

Properties.

1- Closure.
2- Complement.
3- Intersection.

Concatenation ≠ Intersection.

Intersection:

$((A \cap B)')' = (A' \cup B')'$

$\gamma_1 + \gamma_2 = \gamma_1$ or γ_2.

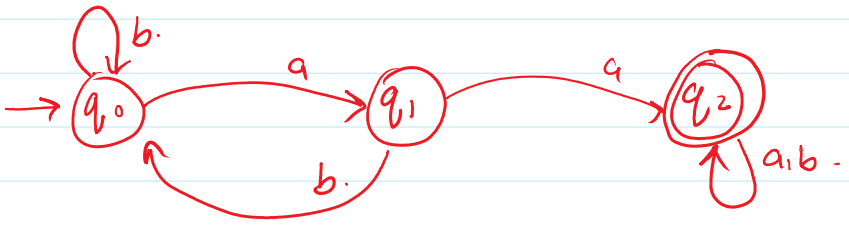
$A \cap B = (A' \cup B')'$

$L_1 \cap L_2 = (L_1' \cup L_2')'$. Using De Morgans.

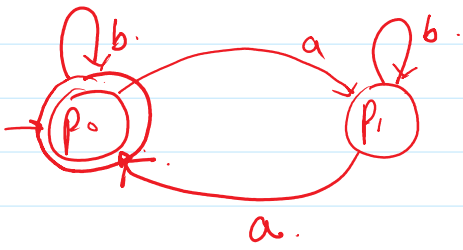
$= (L_1' + L_2')'$

Ex:- $\gamma_1 =$ $(a+b)^* aa (a+b)^*$ atleast Consecutive two a's.

γ_2 $b^*(ab^*ab^*)^*$ even a's

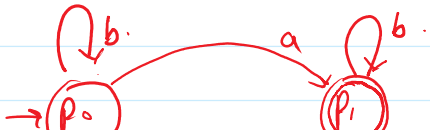


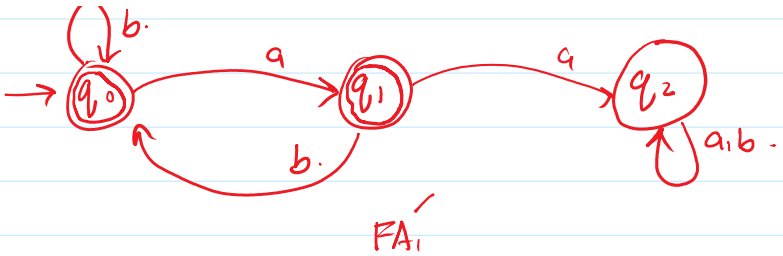
FA1



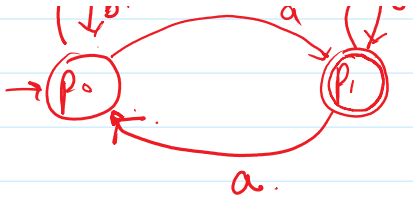
FA2.

Computing Complement.



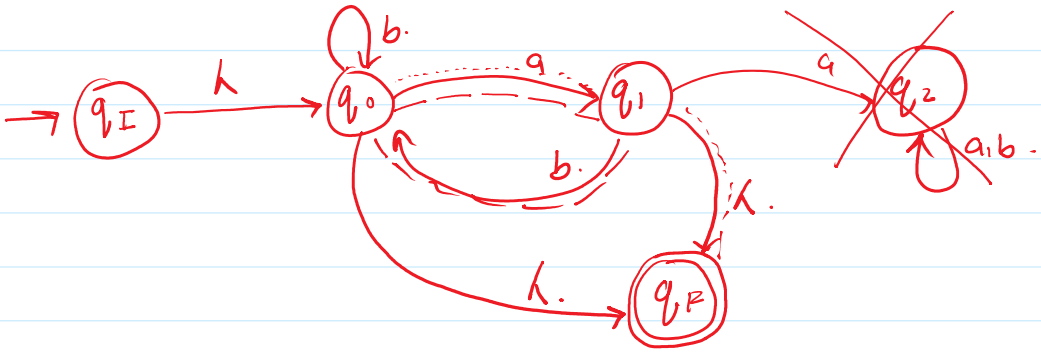


FA1



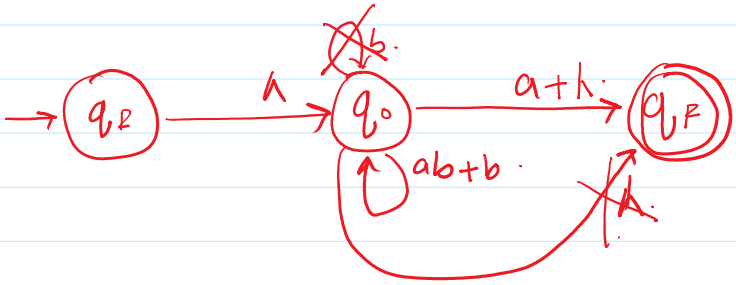
FA2.

Finding Regexes. Corresponding to Complement.



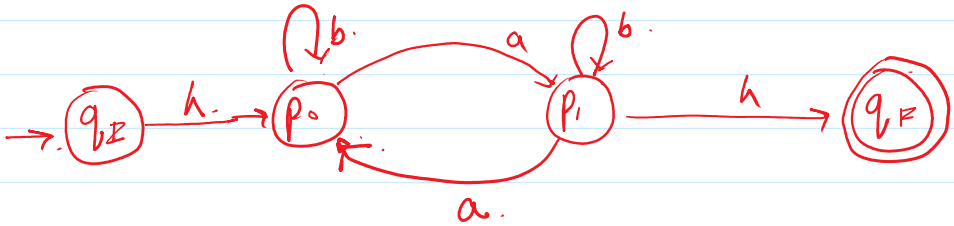
---- $a.\lambda = a$

---- $= ab$.



$\lambda(ab+b)^*(a+\lambda)$.

$= (ab+b)^*(a+\lambda)$.



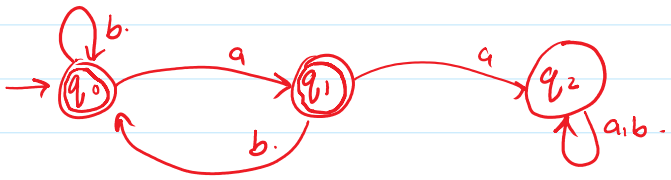
29-10-2022.

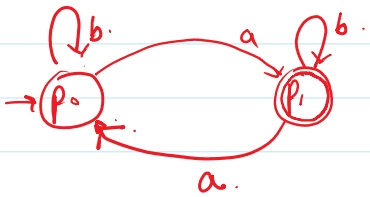
HW.

$b^*ab^+(ab^+ab^+)^*$.

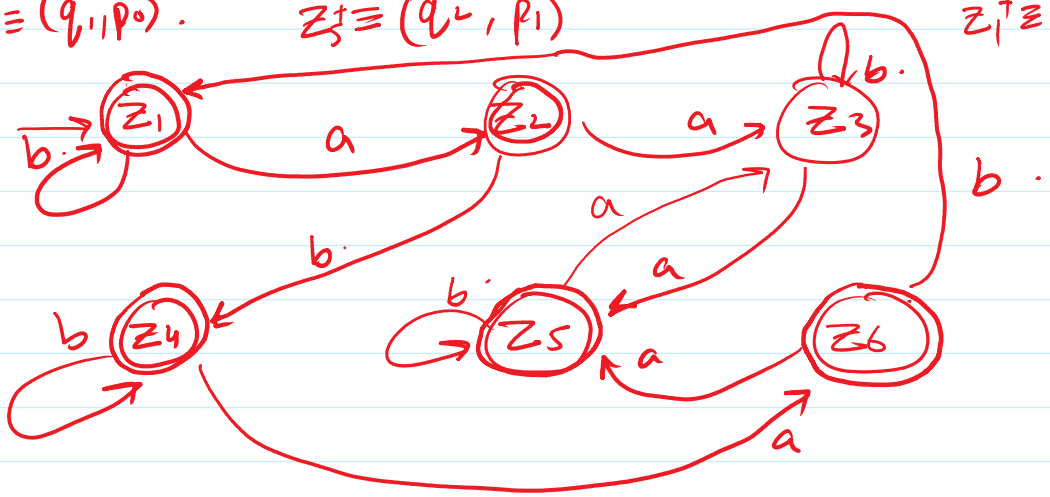
$((ab+b)^*(a+\lambda) + b^*ab^+(ab^+ab^+)^*)'$.

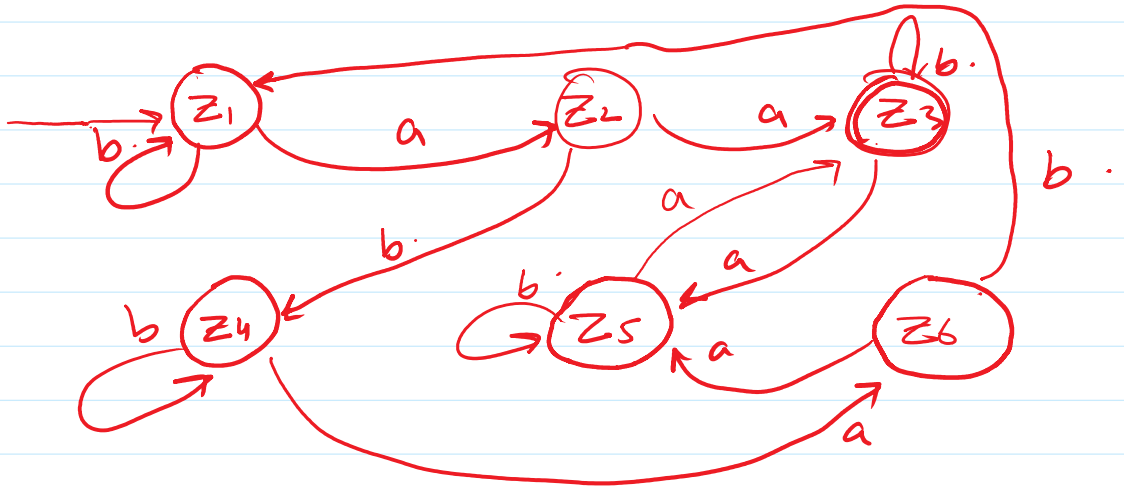
Alternate way for Computing Union.





old State	Transition at 'a'	Transition at 'b'.
$z_1^+ \equiv (q_0, p_0)$	$z_2^+ \equiv (q_1, p_1)$	$z_1^+ \equiv (q_0, p_0)$
$z_2^+ \equiv (q_1, p_1)$	$z_3 \equiv (q_2, p_0)$	$z_4^+ \equiv (q_0, p_1)$
$z_3 \equiv (q_2, p_0)$	$z_5^+ \equiv (q_2, p_1)$	$z_3 \equiv (q_2, p_0)$
$z_4^+ \equiv (q_0, p_1)$	$z_6^+ \equiv (q_1, p_0)$	$z_4^+ \equiv (q_0, p_1)$
$z_5^+ \equiv (q_2, p_1)$	$z_3 \equiv (q_2, p_0)$	$z_5^+ \equiv (q_2, p_1)$
$z_6^+ \equiv (q_1, p_0)$	$z_5^+ \equiv (q_2, p_1)$	$z_1^+ \equiv (q_0, p_0)$





$\gamma_1 =$ $(a+b)^* aa (a+b)^*$ aab ✓

γ_2 $b^*(ab^*ab^*)^*$ aab ✓.

Steps for Intersection.

Step 1 :- Regex to FA_1 & FA_2.

" 2 :- Compute FA_1' & FA_2'.

" 3 :- Using TT Compute Union.

" 4 :- Make DFA from TT.

" 5 :- Compute Complement of FA determined in step 4!

Non Regular Language :-

→ No Regex.