lecture 28:- Regular language.

→ Regex.

Properties:-

→ Closure.

→ Complement.

→ Intersection.

How to Compute Intersection.

L_1 & L_2 be two languages.

$$L_1 \cap L_2 = (L_1' \cup L_2')'.$$

$$= (L_1' + L_2')'.$$

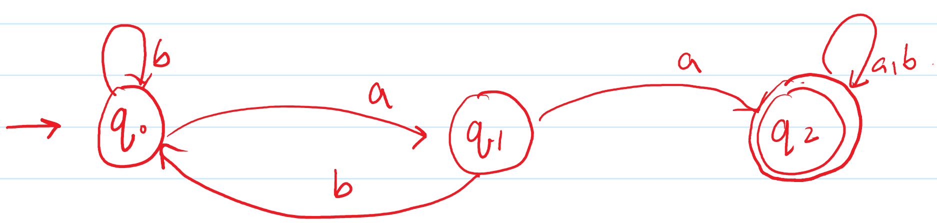
$(A \cap B)' = A' \cup B'$.

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

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

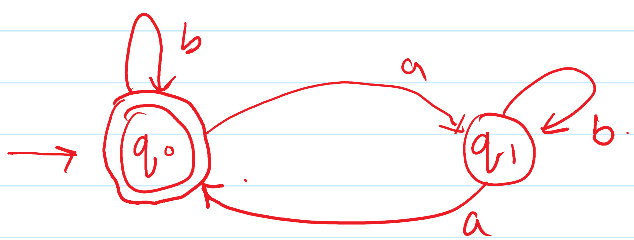
Ex:- $L_1 \to r_1 = (a+b)^* aa (a+b)^*$

$L_2 \to r_2 = b^* (a b^* a b^*)^*$.



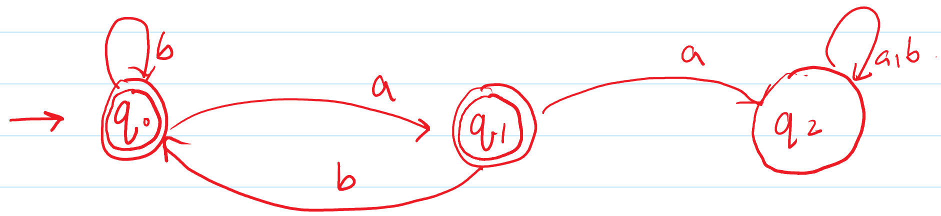
FA1.

FA1.

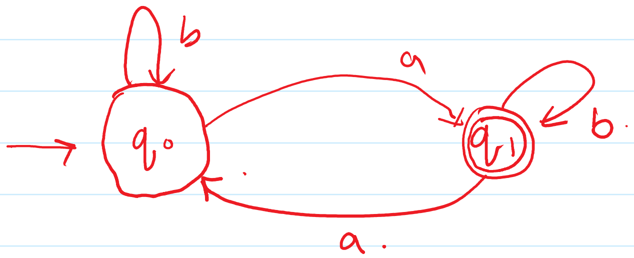


FA2.

Complement Computation.

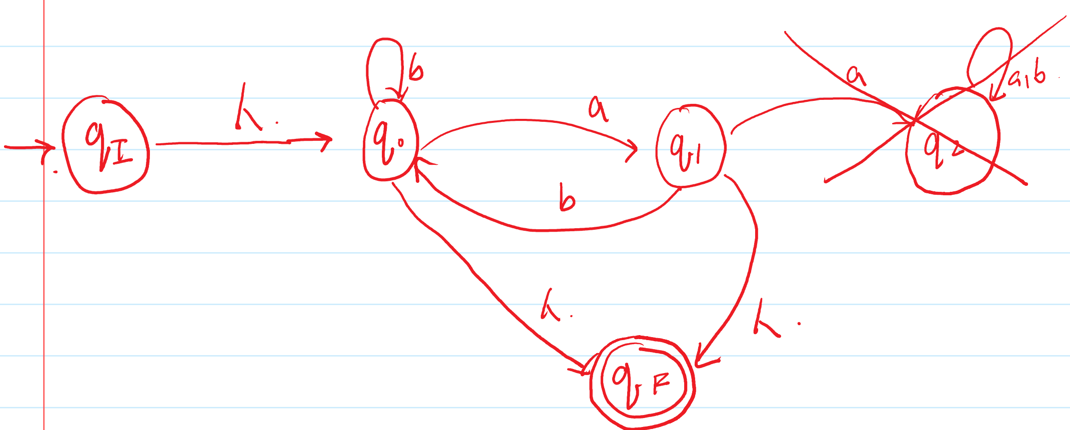


FA$_1'$.

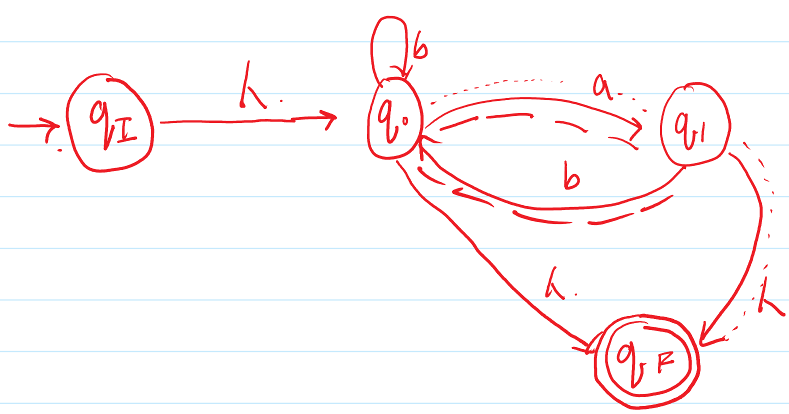


FA$_2'$.

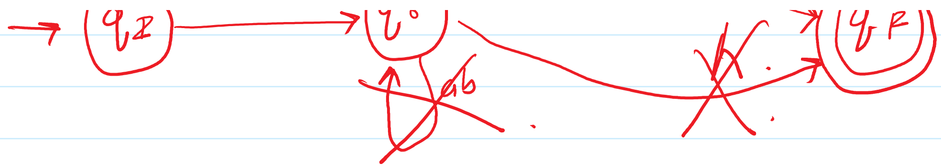
Computing Regexes of the Complemented Automata's.

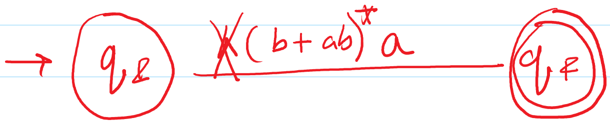


FA$_1'$

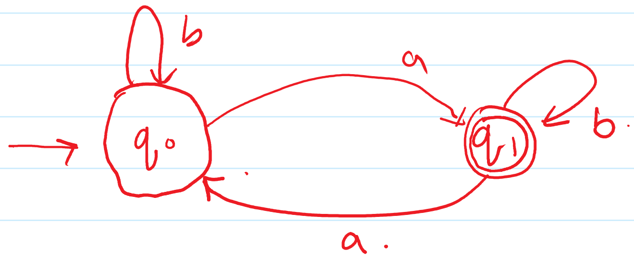


delete q_1.





$(b+ab)^*a$.



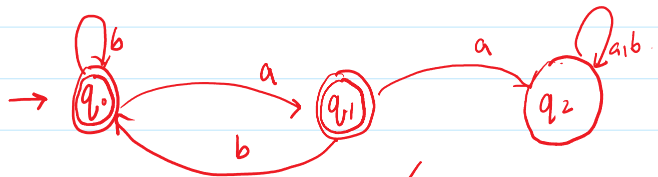
FA_2'.

Activity Regex = $(b+ab^*a)^*ab^*$

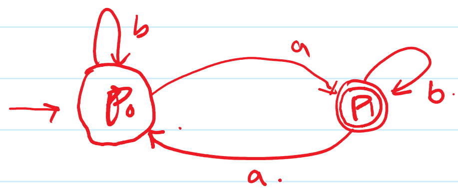
Confirm this HW.

$L_1' + L_2'$

$= (b+ab)^*a + (b+ab^*a)^*ab^*$ How to Complement this.

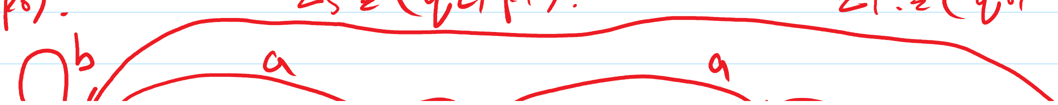


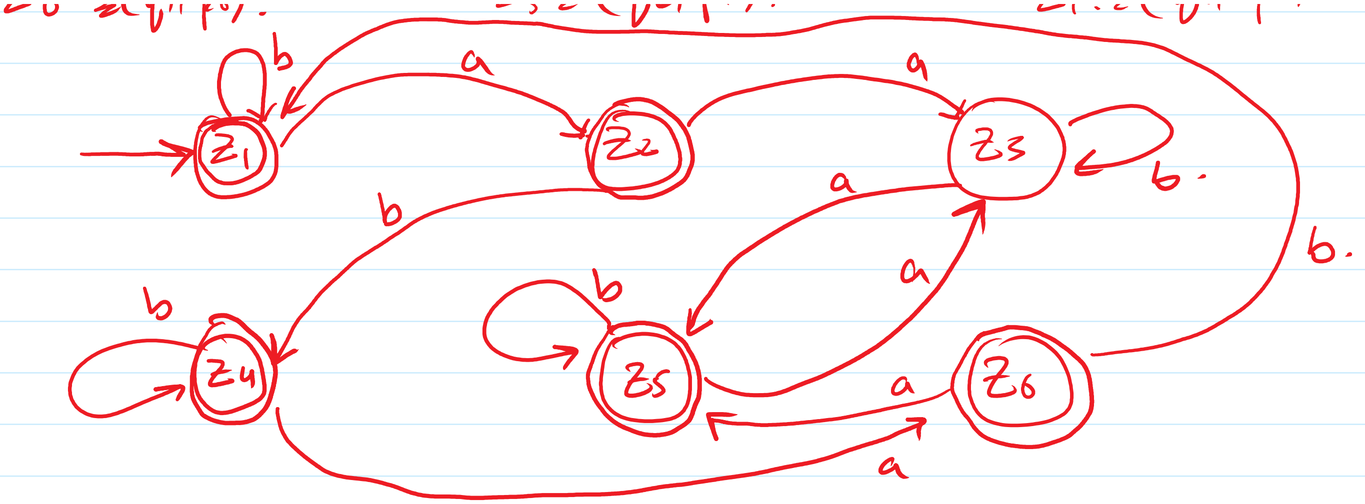
FA_1'.



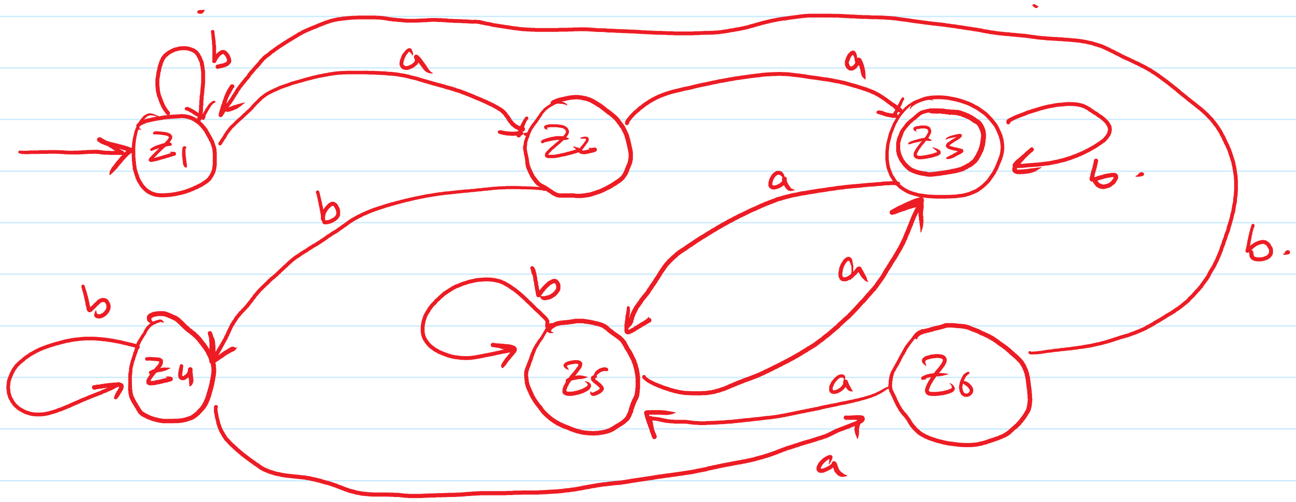
FA_2'.

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





Taking Complement Again.



Compute Regex Again.

Step 1 :- Make FA_1' & FA_2'.

Step 2 :- $FA_1' + FA_2'$ Using Transition Tables.

Step 3 :- Make $(FA_1' + FA_2') \equiv FA_3$ Construct Using TT.

Step 4 :- Find FA_3'.

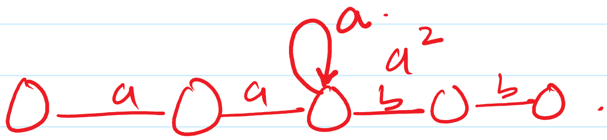
Step 5 :- Find Regex Against FA_3'.

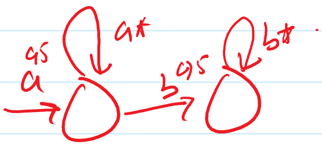
NON-REGULAR :-

- No Regex.

Ex:- $L = \{a^n b^n, n = 0, 1 --- \}$.

$a^* b^*$. X. a^{22}. $a^{100} b^{200}$.

FA:- 



$a^{95} a^{m} b^{95}$ 7. $a = 95$.

$a^{95+7+7+7+7+7+7+7} b^{95}$. $*_=$

$a^n b^n$. $a^{95} (a^1)^m b^{95} (b^1)^m$ $m = 0, 1, ----$.

$a^* b^*$.