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Regular Language Models Part-2

Regular Language :

Content:

1. **Construction of FA**

Identity of Regular Expression:-

If P,Q,R,S are 3 regular expression then the following identity holds and are very useful to solve the regular expression.

1. R+R=R
2. P+Q=Q+P
3. R+O=O+R=R
4. RO=OR≠O
5. P(Q+R)=PQ+PR
6. (Q+R)P=QP+RP
7. (P+Q)+R=P+(Q+R)
8. P(QR)=(PQ)R
9. $R^*=RR^*=R^*R=R^*R=(R^*)^*$
10. $\lambda+RR^*=R^*$
11. $R=(P+Q)=(R^*Q^*)=(P^*+Q^*)^*$
12. $(PQ)^*=(P^*R^*)^*=(P^*Q)^*$

Type 3 grammers

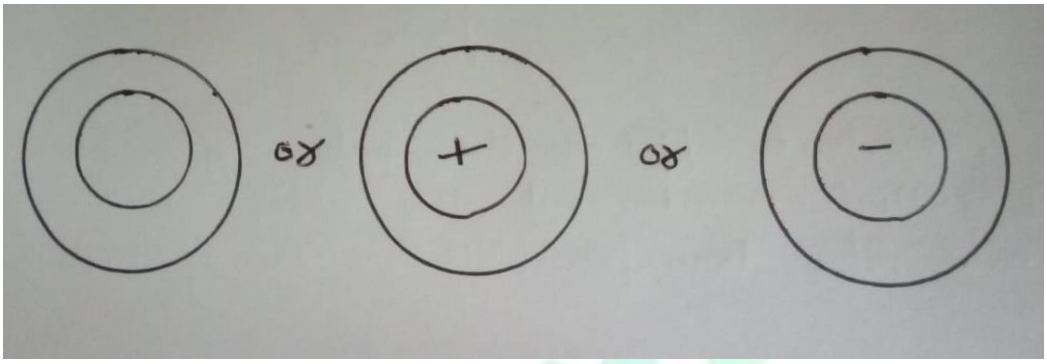
FA ——— Acceptor language (regular)

Least powerful

States ———

Initial state ——— or

Final state

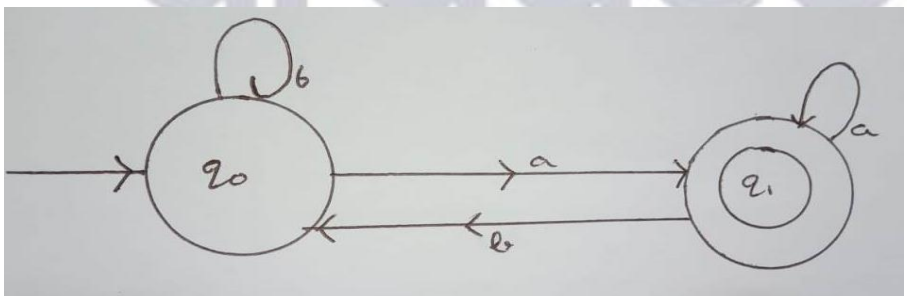


Σ={a,b}

String ending with a

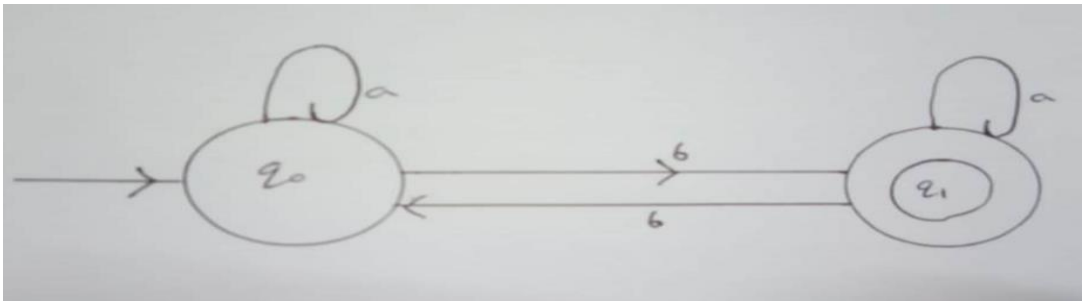
{a,aa,ba,aaa,aba,,bba....}

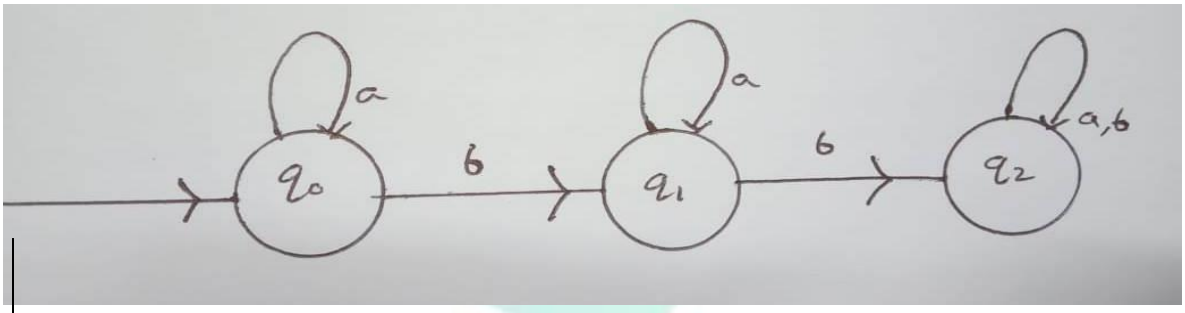
$(a+b)^*a$



Draw an Fa that will accept exactly one b

Σ={a,b}



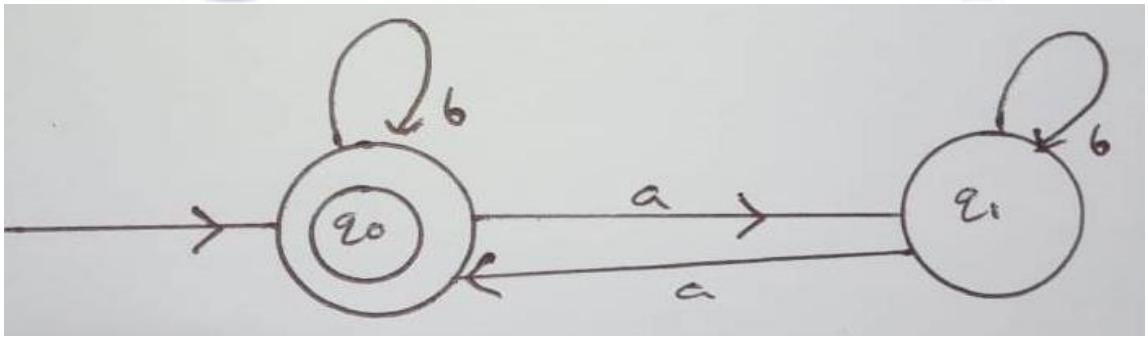


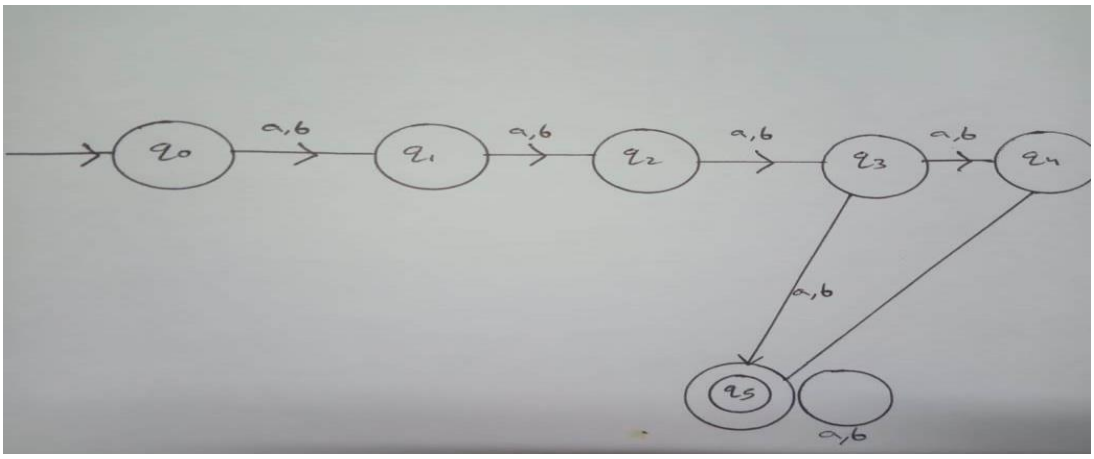
FA

DFA

(Deterministic FA)

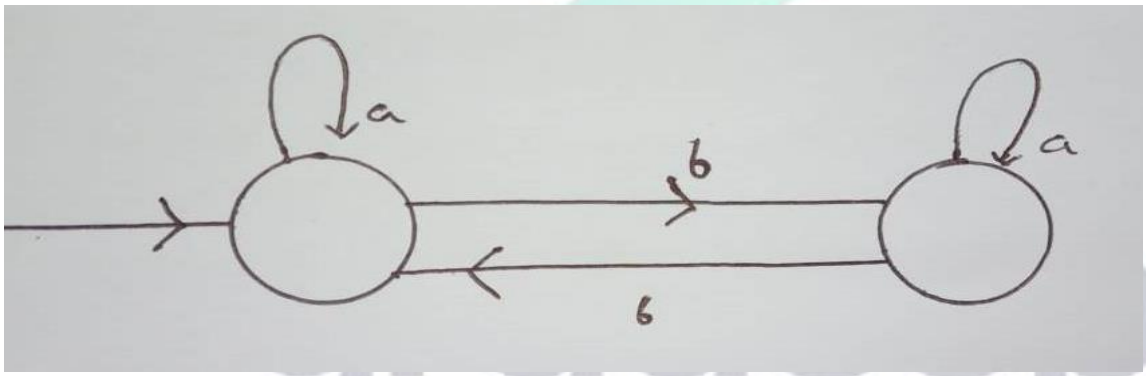
Draw an FA that will except even

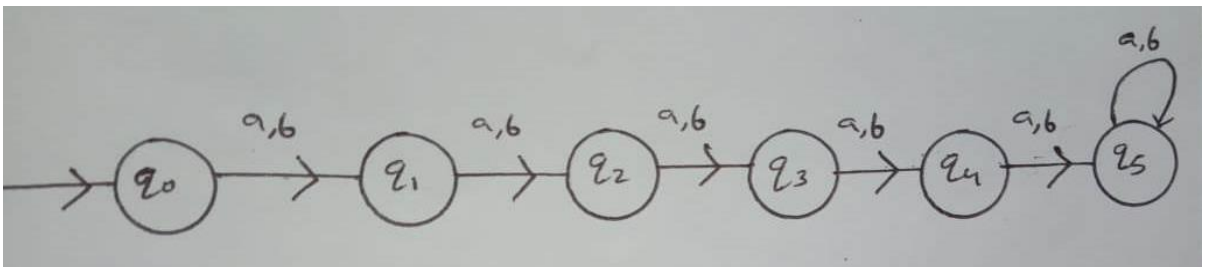




FA strings of length more than four

Q. ODD No.Of b's



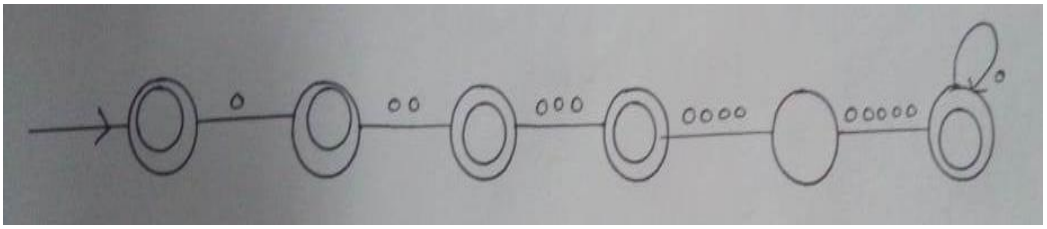


Minimal DFA for L={0^N/ n≯,0,n =4} will have

{0,00,000,00000,...}

1. One final state among 5 state

2. 4 final state among 5 state
3. 1 final state 6 state
4. 5 final state 6 state



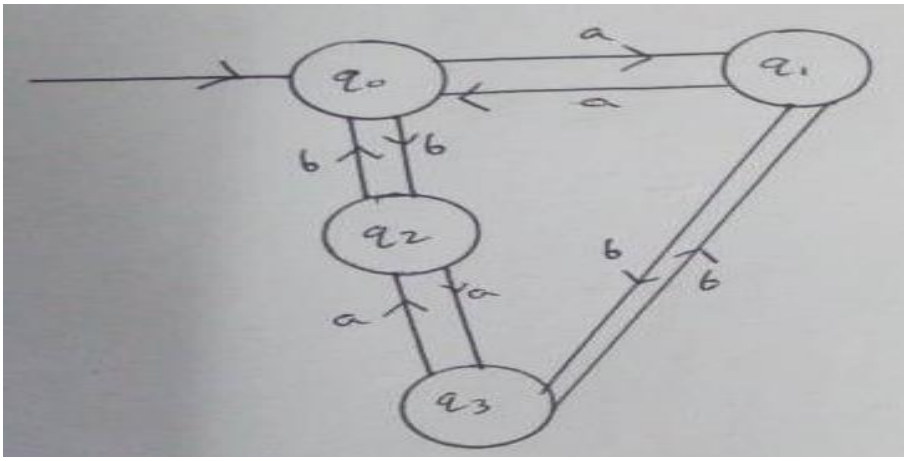
The transmission function for language L is

L= { W /n_a(w) & h_b(w) are both odd}

Is given by:

L= Σ W / n_a (w)

- ∂ (q_0,a)=q_1
- ∂ (q_0,b)=q_2
- ∂ (q_1,a)=q_0
- ∂ (q_1,b)=q
- ∂(q_2,a)=q_3
- ∂ (q_2,b)=q_0
- ∂ (q_3,a)=q_2
- ∂ (q_3,b)=q_1



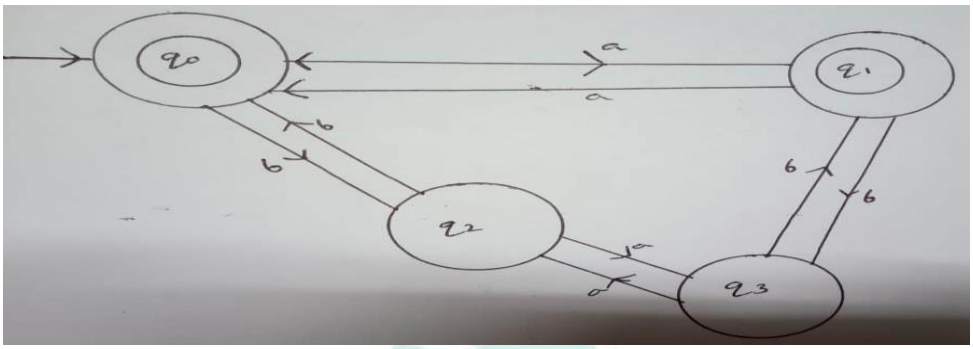
final state of automata are:-

1 q_0&q_0

2 q_0&q_1

3 q_0&q_2

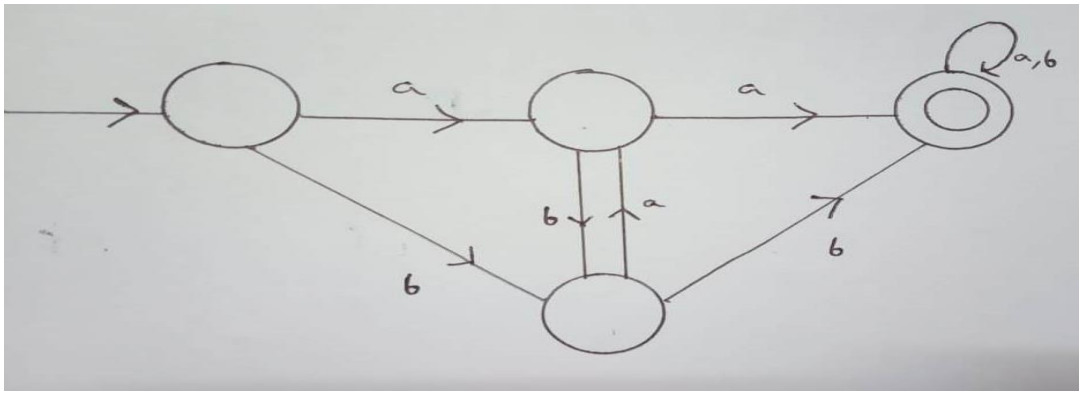
4 q_0&q_3



DFA:- 1. Deterministic means on each input there is one & only one state at which automata can have transition for the current state.

2. At every state for every particular input there must be an outgoing.

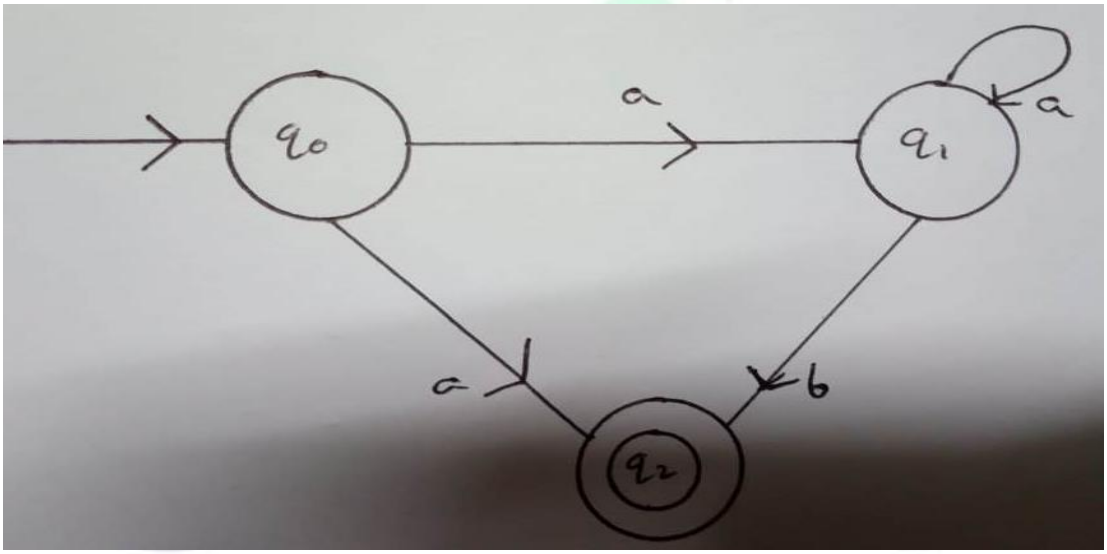
FA that accept aa or bb



NFA :- non determentic finite automate:-

Another type of FA in which there may be several possible next state for each input value. The difference between DFA&NFA is

- In DFA the next state function take us to a unique definite state where as in case of NFA there are set of states.
- Another difference is in DFA there is excretly one path between initial and final state where as in NFA there could be more than one path between initial and final state.



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