

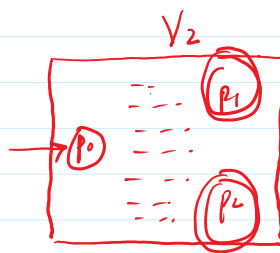
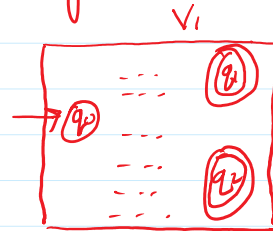
lecture 15:-

DFA to NFA.

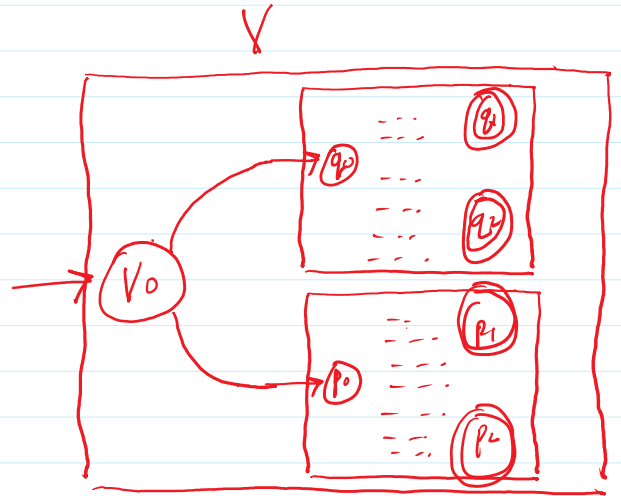
- Union.
- Concatenation.
- Closure.

General

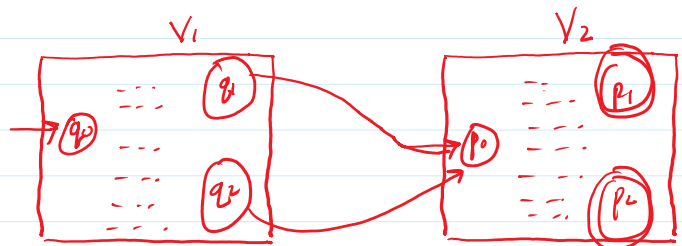
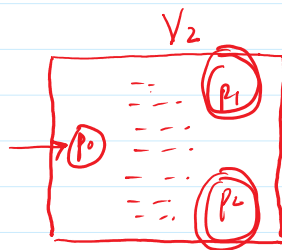
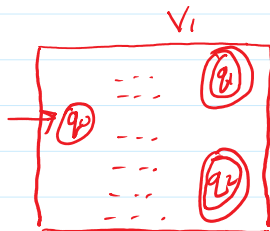
Syntax.



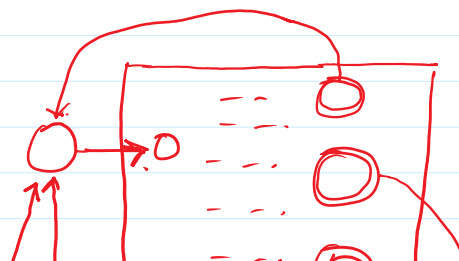
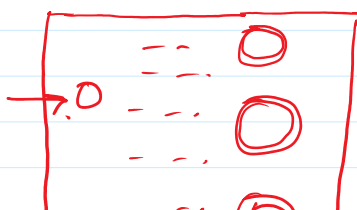
Union.

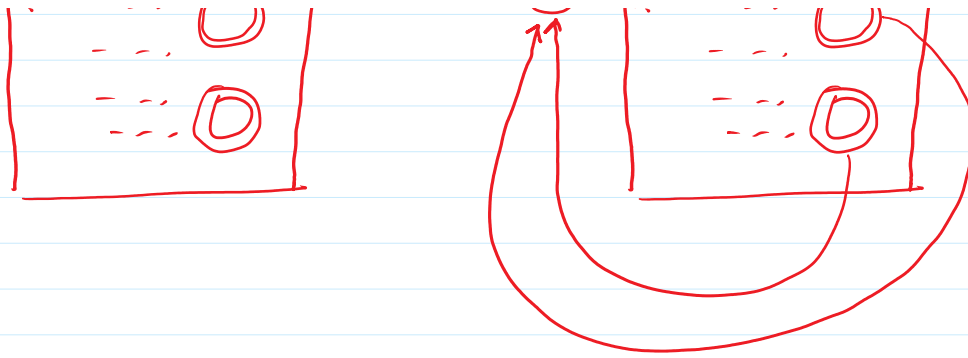


Concatenation.



Closure.





Moore Machine & Mealy Machine.

Two types of Machines.

1- Recognizer (Accept / reject a pattern).

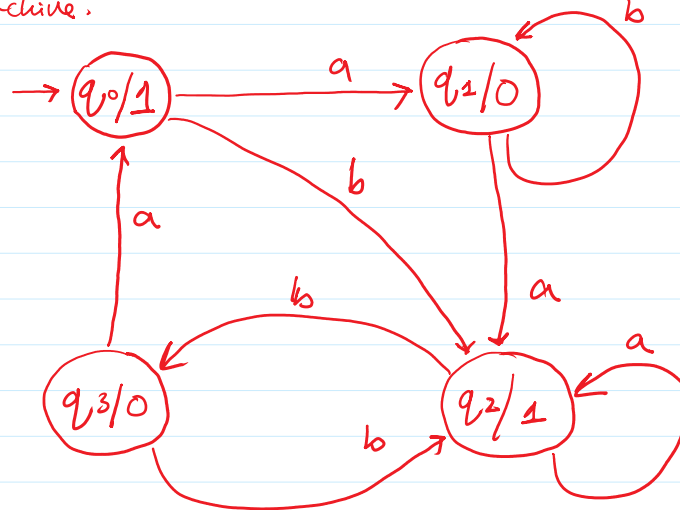
2- Generators (outputs).

- Moore Machine.

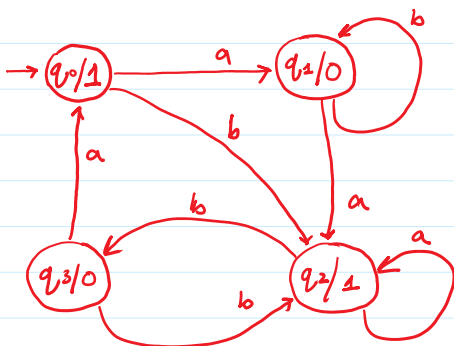
- Mealy "

Moore Machine:-

Ex.



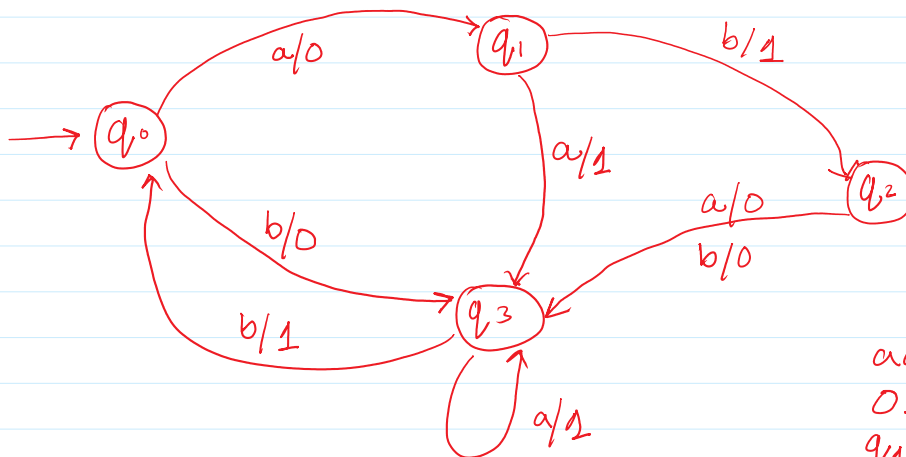
(a b a a b b)
 1 0 0 1 1 0 1 0
 ↑
 whole pattern.



Construct Moore Machine.
 from table below.

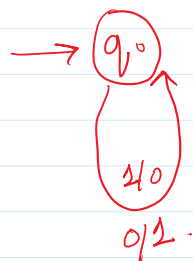
Old state	New states		Method 1 outputs.		Method 2 output by old state
	a	b	a	b.	
q_0	q_1	q_2	0	1	1
q_1	q_2	q_1	1	0	0
q_2	q_2	q_3	1	0	1
q_3	q_0	q_2	1	1	0

Mealy Machine :-



$a a a b b .$
 $0 1 1 1 0$
 $q_1 q_2 q_3 q_0 q_3 .$

Ex 1:- Design a mealy machine for 1's Complement.



$0 0 1 0 1 0 .$
 $1 1 0 1 0 1 .$
 $q_0 q_0 q_0 q_1 q_0 q_0 .$

Ex 2:- Design a mealy machine for adding 1 to a binary string.

$11 = 10 11 \rightarrow$
 $12 = 11 00 \leftarrow$

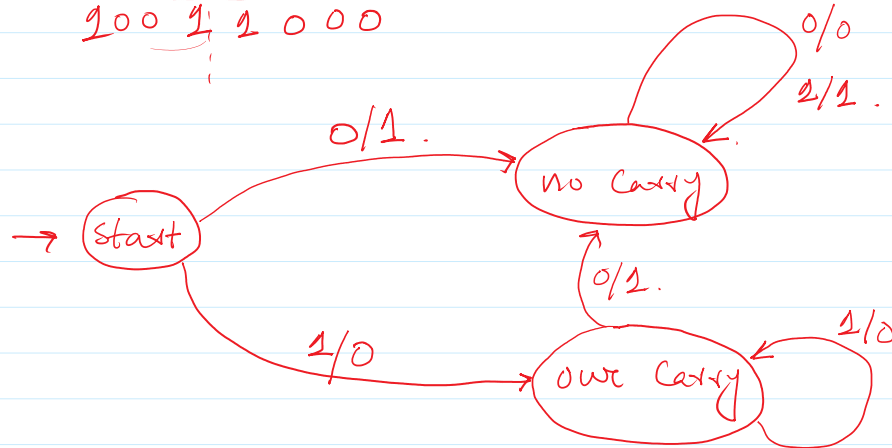
$$\begin{array}{r} 110001 \\ \underline{1} \\ 10 \end{array}$$

$$\begin{array}{r} 11000 \\ \underline{1} \\ 11001 \end{array}$$

$$\begin{array}{r} 1100111 \\ \underline{1} \\ 10011000 \end{array}$$

$$\begin{array}{r} 01111 \\ \underline{1} \\ 10000 \end{array}$$

$$\begin{array}{r} 11110 \\ 00001 \\ \underline{10000} \end{array}$$



$$\begin{array}{r} 1101 \\ 0011 \end{array}$$

$$1100 = 12$$

Definition.

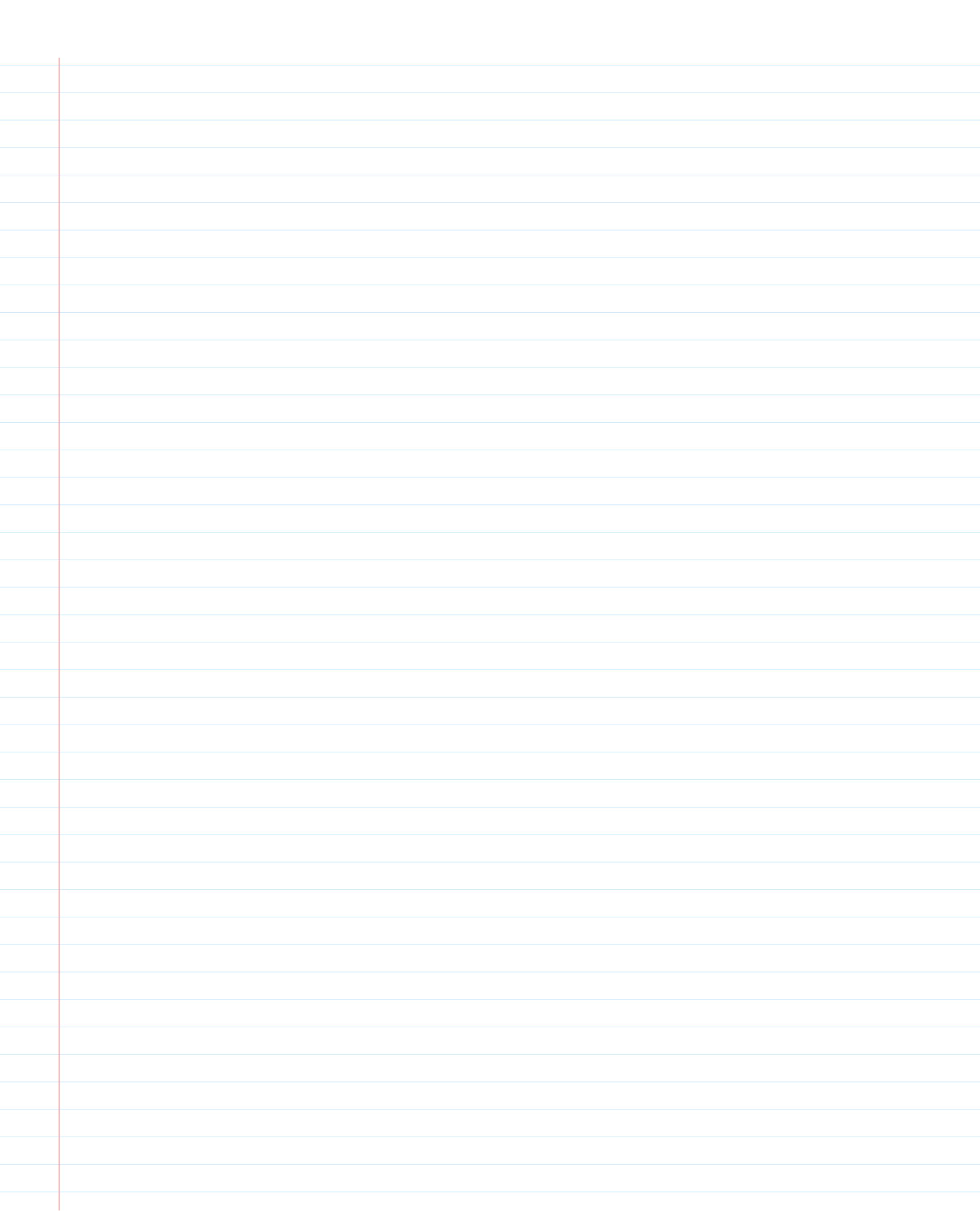
Moore.

1. A finite Set of States.
2. $\Sigma = \{a, b, c, \dots\}$.
3. $\Gamma = \{0, 1, \dots\}$.
4. Transition table.
5. Moore = DPA.

(Final of PFA is replaced by output of 1)
Non final = output of 0's.

Moore = Mealy.

(Moore \rightarrow Mealy).
(Mealy \rightarrow Moore). } Conversions.



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