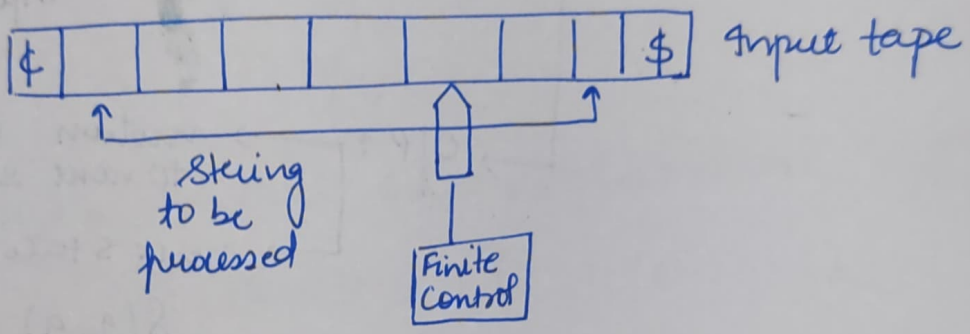
Lecture 3

I. few examples of machines with conditions

II. Block diagram of a finite automatation.:



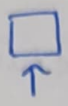
(i) **Input tape**:- divided into squares, each square containing a single symbol from the input alphabet Σ.

- ¢ : end marker at the left.
- $: end marker at the right.

→ absence of end markers indicates the tape is of infinite length.

→ sequence is from L → R.

(ii) **Reading head** : examines only one square at a time.



(iii) **Finite Control** : → input to it ← present state of m/c (q). ← symbol under R-head (a)

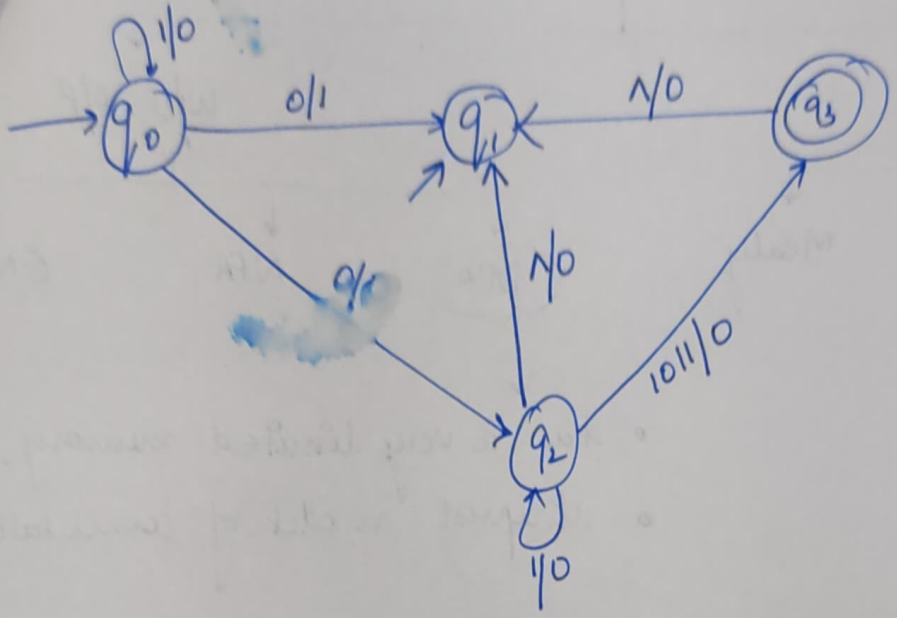
→ O/P : → motion of R-head to next square

→ next state of FSM by $\delta(q, a)$

*. A transition system (δ) accepts a string w in Σ^* if

(i) there exists a path which originates from some initial state, ----> & terminates at some final state.

(ii) the path value obtained by concatenation $= w$.



Determine ① initial state, ② final states

③ 101011 ④ 111010

Ans: ① q_0 & q_1

② q_3

③ $q_0 q_0 q_2 q_3$

Q.2 $\delta(q, \wedge) = q$

state change hundi ae?

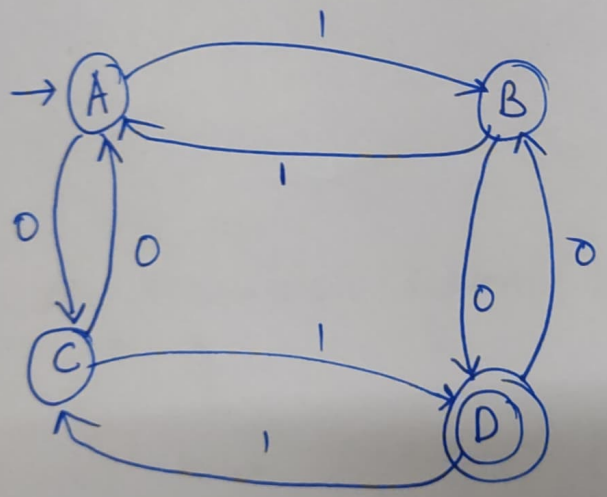
*.

Finite Automata

- With o/p
  - Moore
  - Mealy
- W/O o/p
  - DFA
  - NFA
  - ∈NFA

- has a very limited memory.
- simplest model of computation.

edges are transition



$\delta(A, 1) \rightarrow$ B state

$\delta(B, 0) \rightarrow D$

$q_0 = A$

$F = (D)$

$Q = \{A, B, C, D\}$

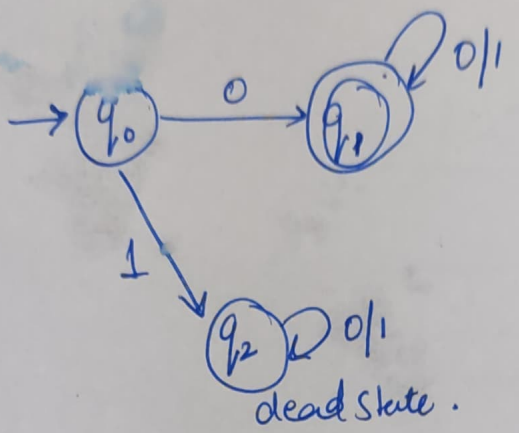
	0	1
A	C	B
B	D	A
C	A	D
D	B	C

: $\delta : Q \times \Sigma \rightarrow Q$

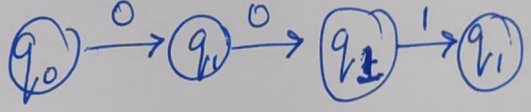
Examples :-

(1) L_1 = set of all strings start with '0'.

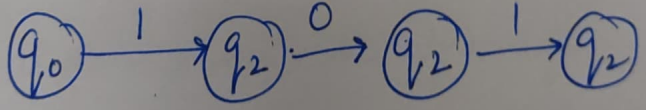
$= \{0, 00, 01, 000, 011, 0000 \ldots\}$



eg:- 001 is accepted or not.



101



q_2 is not final state.

(2) Construct a DFA that accepts all strings over 0,1 of length 2.

$L_2 = \{00, 01, 10, 11\}$