Moore Machine

Finite state machine in which the next state is decide by the current state and current input.

The output symbol at a given time depends only on the present state of the machine.

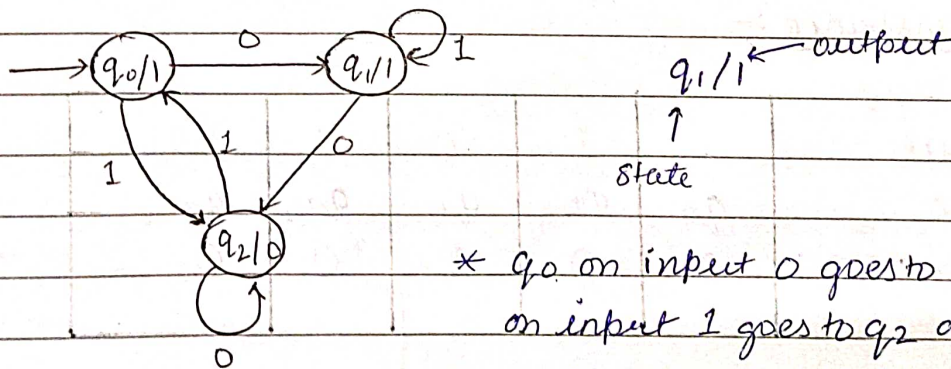Describle using 6 tuples :-

Q = finite set of states
Σ = input symbol
q_0 = initial state
0 = output alphabet
δ = transition function where $Q \times \Sigma \to Q$
λ = output function where $Q \to 0$

Example State diagram for moore machine

$q_1/1 \leftarrow$ output
$\uparrow$
state

* q_0 on input 0 goes to q_1 and on input 1 goes to q_2 and it produce output 1.

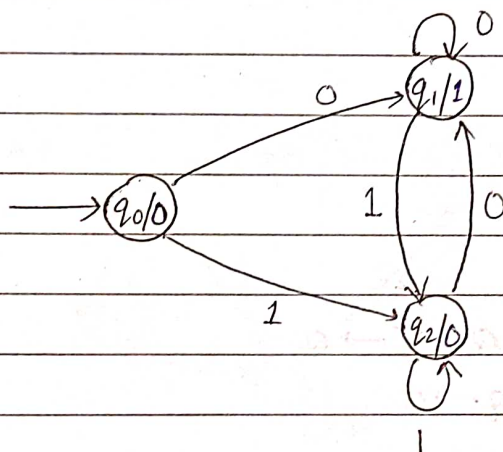| Current State	Next State (δ)		Output (λ)
	0	1	
q_0	q_1	q_2	1
q_1	q_2	q_1	1
q_2	q_2	q_0	0

Input :- 010

Transition:- $\delta(q_0, 0) \Rightarrow \delta(q_1, 1) \Rightarrow \delta(q_1, 0) \Rightarrow q_2$

Output :- 1 1 1 0

Example Design a moore machine to generate 1's complement of a given binary number

Input :- 10101, 0, 1, 01, 10, 11, 00

Expected Output :- 01010, 1, 0, 10, 01, 00, 11

For instance :-

Input		1	0	1	1	
State	q_0	q_2	q_1	q_2	q_2	
Output	0	0	1	0	0	

Mealy Machine

Machine in which output depends upon the present input symbol and present state of machine.

In mealy machine, the output is represented with each input symbol for each state separated by /.

Described using 6 tuples :-

Q :- finite set of states
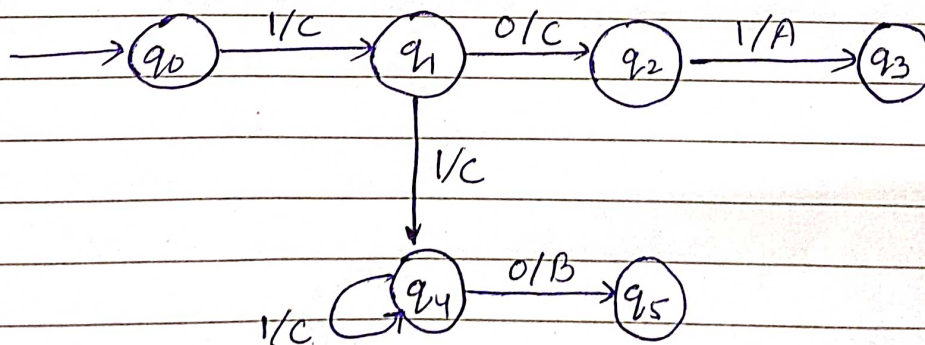q_0 :- initial state of machines
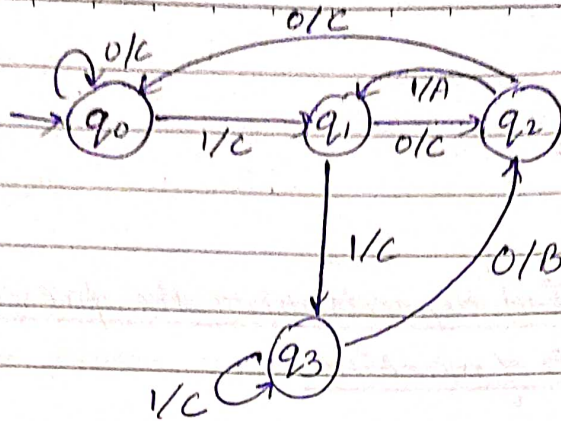Σ :- finite set of inputs
O :- output
δ :- transition function $Q \times \Sigma \rightarrow Q$
λ :- output function $Q \times \Sigma \rightarrow O$

Example Design a mealy machine for a binary sequence such that if it has a substring 101, the machine output A, if 110 output B else output C.

Example Design a mealy machine that scans sequence of input of 0 and 1 and generate output A if string terminates 00, output B if terminates in 11 and output C otherwise.