

Transforming Mealy to Moore Machine



Consider the Mealy machine described by the transition table given by Table 3.10. Construct a Moore machine which is equivalent to the Mealy machine.

TABLE 3.10 Mealy Machine of Example 3.9

Present state	Next state			
	Input $a = 0$		Input $a = 1$	
	state	output	state	output
$\rightarrow q_1$	q_3	0	q_2	0
q_2	q_1	1	q_4	0
q_3	q_2	1	q_1	1
q_4	q_4	1	q_3	0

Construct a Mealy Machine which is equivalent to the Moore machine given by Table 3.14.

TABLE 3.14 Moore Machine of Example 3.10

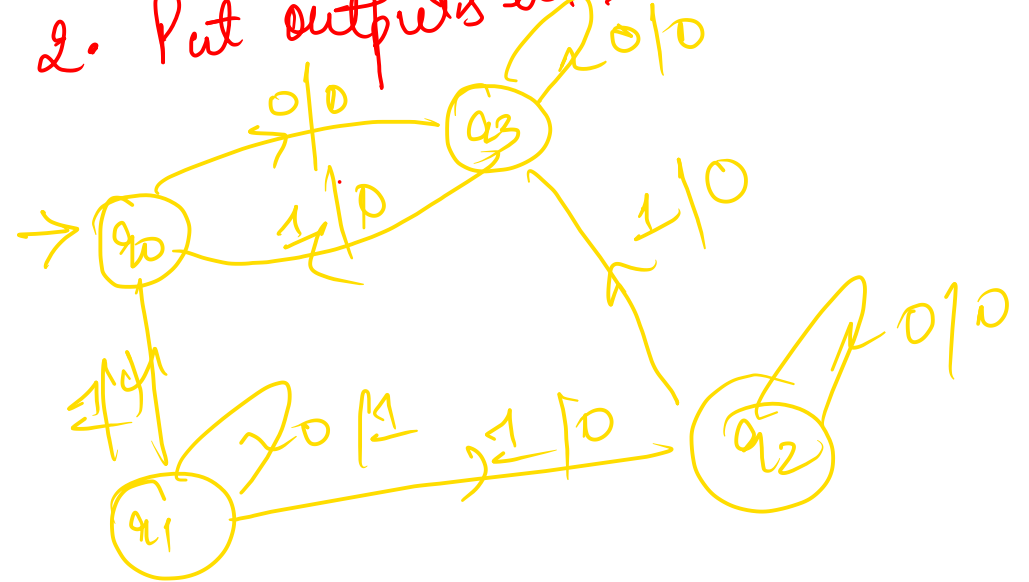
Present state	Next state		Output
	a = 0	a = 1	
$\rightarrow q_0$	q_3	q_1	0
q_1	q_1	q_2	1
q_2	q_2	q_3	0
q_3	q_3	q_0	0

Convert Moore to Mealy

1. Take o/p's of state

$q_0 \Rightarrow 0, q_1 \Rightarrow 1, q_2 \Rightarrow 0, q_3 \Rightarrow 0$

2. Put outputs in transition



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q_2	q_1	1	q_4	0
q_3	q_2	1	q_1	1
q_4	q_4	1	q_3	0

	0	0/1	1	0/1
$\rightarrow q_1$	q_3	0	q_2	0
q_2	q_1	1	q_4	0
q_3	q_2	1	q_1	1
q_4	q_4	1	q_3	0

Mealy to Moore Machine

1. Focus on Transition with different I/O

$$q_3 \rightarrow 0, 0 \Rightarrow 0$$

$$q_1 \rightarrow 1, 1 \Rightarrow 1$$

$$q_2 \rightarrow 1, 0 \Rightarrow 0$$

$$q_4 \rightarrow 1, 0 \Rightarrow 0$$

different I/Os are being for q_2, q_4

2. Create States with different I/O

$$q_2 \rightarrow 0, 0 \Rightarrow 0$$

$$q_2 \rightarrow 0, 1 \Rightarrow 1$$

$$q_4 \rightarrow 0, 0 \Rightarrow 0$$

$$q_4 \rightarrow 0, 1 \Rightarrow 1$$

3. Refer table create new table as per new states

4. Refer definition of Moore Machine

Moose Machine

→ Every state is associated with o/p

→ $q_3 \Rightarrow q_0 \Rightarrow 0, q_1 \Rightarrow \underline{1}, 1 \Rightarrow \underline{1}, q_{20} = 0, q_{21} \rightarrow 1, q_{40} > 0, q_{41}, 1$

Moose Machine

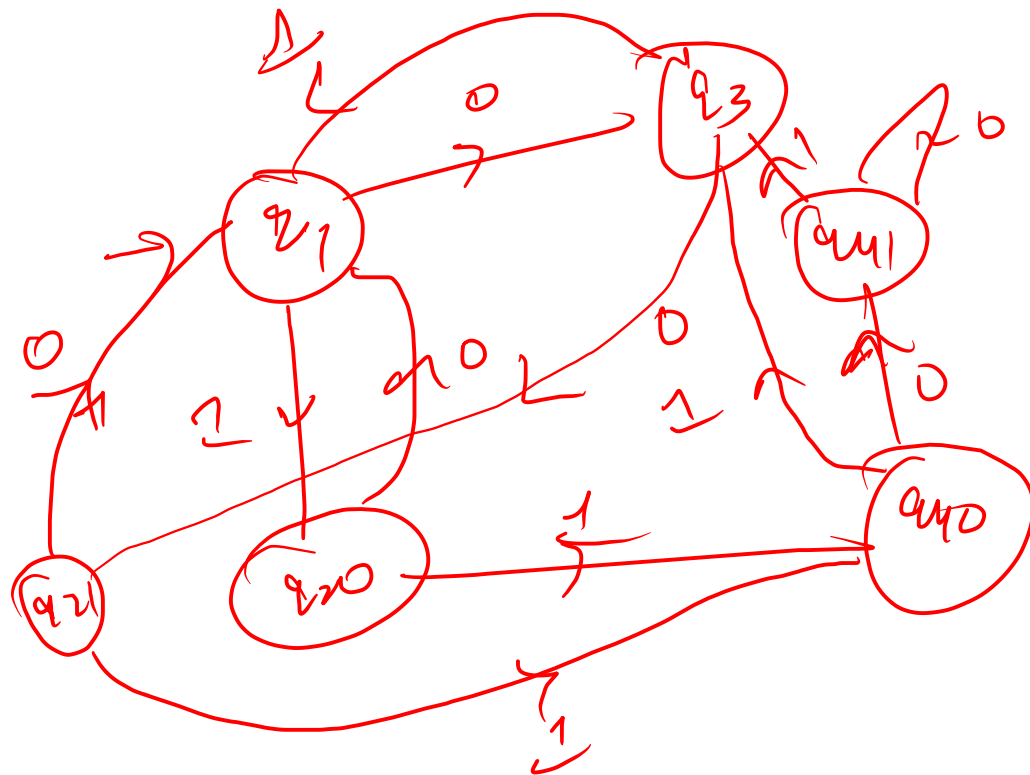
	0	1	O/P
$\rightarrow q_1$	q_3	q_{20}	1
q_{20}	q_1	q_{40}	0
q_{21}	q_1	q_{40}	1
q_3	q_{21}	q_1	0
q_{40}	q_{41}	q_3	0
q_{41}	q_{41}	q_3	1

	0	1	O/P
$+ q_1$	q_3	q_{20}	1
$\rightarrow q_{20}$	q_1	q_{40}	0
q_{21}	q_1	q_{40}	1
q_3	q_{21}	q_1	0
q_{40}	q_{41}	q_3	0
q_{41}	q_{41}	q_3	1

r21

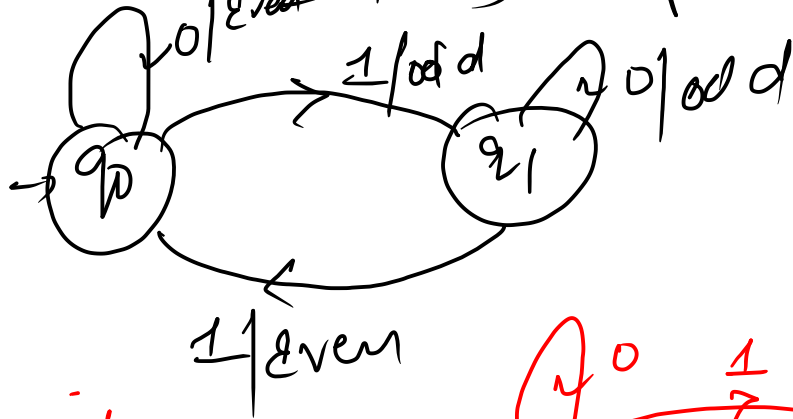
[Moore Machine]

	0	1	O/P
q1	q3	q20	1
q20	q1	q40	0
q21	q1	q40	1
q3	q21	q1	0
q40	q41	q3	0
q41	q41	q3	1



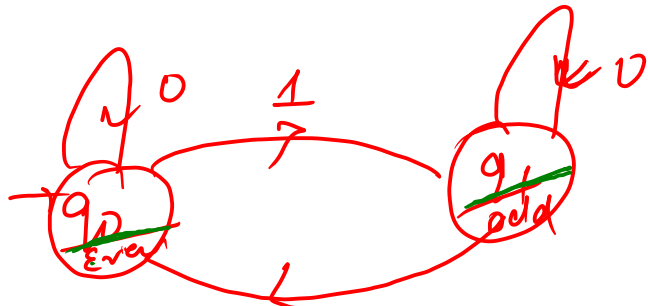
Create a Mealy Machine that prints even, when it encounters even no. of 1's

odd even $\{0, 1\} \rightarrow \text{Inputs}$ $\{ \text{Even, odd} \} \rightarrow \text{Outputs}$



Mealy

Moore Machine



State is associated with output.

DFA

