Theory of Automata and Formal Language

Lecture-14

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Procedure for transforming a Mealy machine into a Moore machine

Example: Construct a Moore machine which is equivalent to the following Mealy machine

Present State	0		1	
	δ	λ	δ	λ
→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

Finite Automata (FA)

Solution: In the first step we split the some states. We split those states that has different outputs. In this example, we split states q_2 and q_4.

Present State	0		1	
	δ	λ	δ	λ
→q_1	q_3	0	q_{20}	0
q_{20}	q_1	1	q_{40}	0
q_{21}	q_1	1	q_{40}	0
q_3	q_{21}	1	q_1	1
q_{40}	q_{41}	1	q_3	0
q_{41}	q_{41}	1	q_3	0

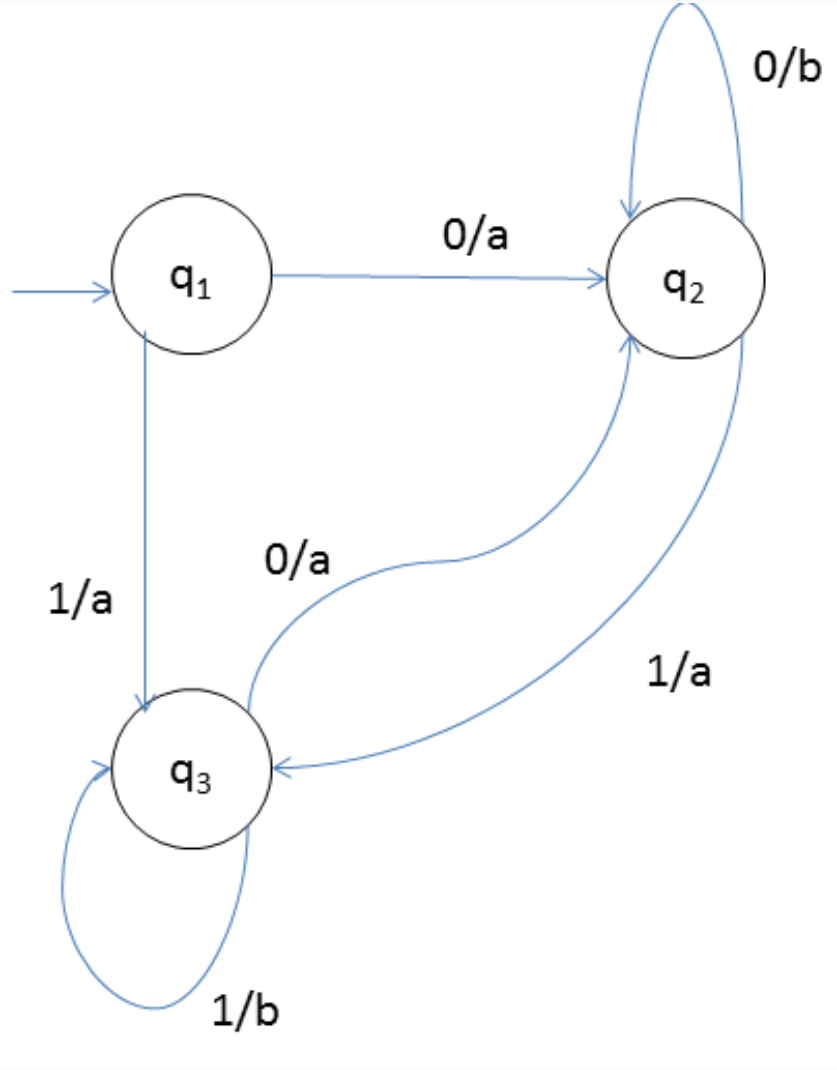
Finite Automata (FA)

Now, we convert above Mealy machine into Moore machine:-

Present State	δ		λ
	0	1	
→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

Finite Automata (FA)

Example: Construct a Moore machine which is equivalent to the following Mealy machine



Finite Automata (FA)

Example: Construct a Mealy machine which can output EVEN, ODD as the total number of 1's encountered is even or odd. The input symbols are 0 and 1.

Example: Construct a Mealy machine that prints 1's complement of an input binary number.

Finite Automata (FA)

Example: Design an incremental Mealy machine.

Example: Design a Mealy machine that prints 2's complement of an input binary number.

Example: Design a Moore machine to determine residue mod 3 for binary number.