

Transition Table

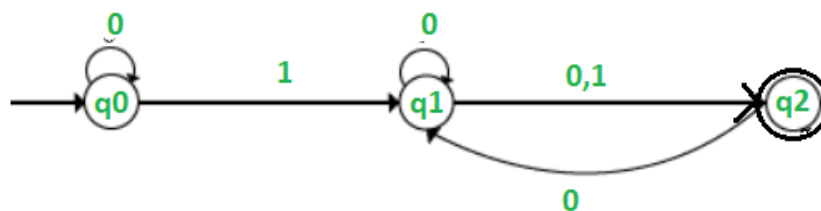
Transition function (δ) is a function which maps $Q * \Sigma$ into Q . Here 'Q' is set of states and ' Σ ' is input of alphabets. To show this transition function we use table called transition table. The table takes two values a state and a symbol and returns next state.

A transition table gives the information about -

1. Rows represent different states.
2. Columns represent input symbols.
3. Entries represent the different next state.
4. The final state is represented by a star or double circle.
5. The start state is always denoted by an small arrow.

Example 1 –

This example shows transition table for NFA (non-deterministic finite automata).



Present State	Next State Of Input 0	Next State For Input 1
->q0	q0	q1
q1	q1, q2	q2
*q2	q1	Null

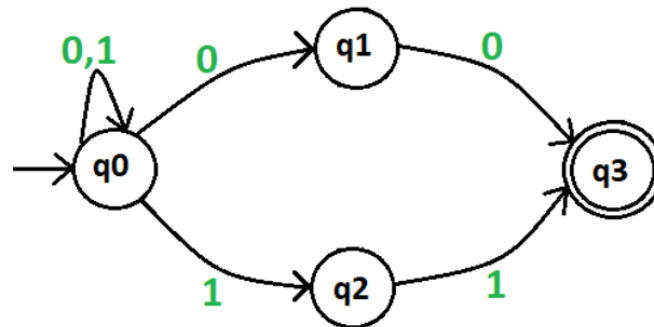
Explanation of above table -

1. First column indicates all the present states, Next for input 0 and 1 respectively.
2. When the present state is q0, for input 0 the next state will become q0. For input 1 the next state is q1.
3. When the present state is q1, for input 0 the next state is q1 or q2, and for 1 input the next state is q2.

- When the current state is q2 for input 0, the next state will become q1, and for 1 input the next state will become Nil.
- The small straight arrow on q0 indicates that it is a start state and circle on to q3 indicates that it is a final state.

Example 2 -

This example shows transition table for NFA (non-deterministic finite automata).



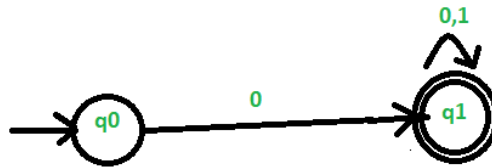
Present State	Next State Of Input 0	Next State For Input 1
->q0	q0, q1	q0, q2
q1	q3	Nil
q2	Nil	q3
*q3	Nil	Nil

Explanation of above table -

- First column indicates all present states, Next for input 0 and 1 respectively.
- When the current state is q0, for input 0 next state will become q0 or q1 and for input 1 the next state is q0 or q2.
- When the current state is q1, for input 0 next state will become q3, and for input 1 the next state is Nil as there is no state for input 1.
- When the current state is q2 for input 0, next state will become nil as there is no state for input 0, and for 1 input the next state will become q3.
- When the current state is q3 for input 0, next state will become nil as there is no state for input 0, and for 1 input the next state will also become nil as there is no state for input 1.
- The small straight arrow on q0 indicates that it is a start state and circle on to q3 indicates that it is a final state.

Example 3 –

This example shows transition table of DFA (deterministic finite automata).



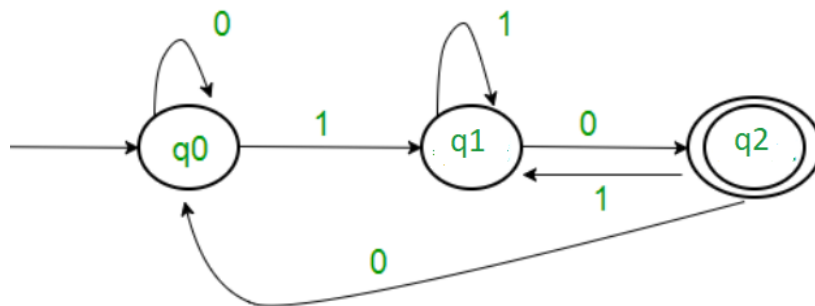
Present State	Next State Of Input 0	Next State For Input 1
->q0	q1	q1
*q1	q1	q1

Explanation of above table -

1. First column indicates all the present states, Next for input 0 and 1 respectively.
2. When the current state is q0, for input 0 the next state will become q1 and for input as 1 the next state is q1.
3. When the current state is q1, for input 0, the next state will become q1, and on 1 input the next state is q1.
4. The small straight arrow on q0 indicates that it is a start state and circle on to q3 indicates that it is a final state.

Example 4 –

This example shows transition table of DFA (deterministic finite automata).



Present State	Next State Of Input 0	Next State For Input 1
->q0	q0	q1
q1	q2	q1
*q2	q0	q1

Explanation of above table -

1. First column indicates all the present states, Next for input 0 and 1 respectively.
2. When the current/present state is q_0 , for input 0 the next state will become q_0 and for input 1 the next state is q_1 .
3. When the current state is q_1 , on input 0, the next state will become q_2 , and for 1 input the next state is q_1 .
4. When the current state is q_2 for input 0, the next state will become q_0 , and for 1 input the next state is q_1 .
5. The small straight arrow on q_0 indicates that it is a start state and circle on to q_3 indicates that it is a final state.

Note - There can be multiple final states in both DFA and NFA but initial state is unique.