CONVERSION OF REGULAR EXPRESSION TO FINITE A TOMATA

To convert the RE to FA, we are going to use a method called the subset method. This method is used to obtain FA from the given regular expression. This method is given below:

Step 1: Design a transition diagram for given regular expression, using NFA with ε moves.

Step 2: Convert this NFA with ε to FA without ε.

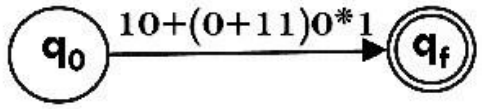
Step 3: Convert the obtained NFA to equivalent DFA.

Example 1:

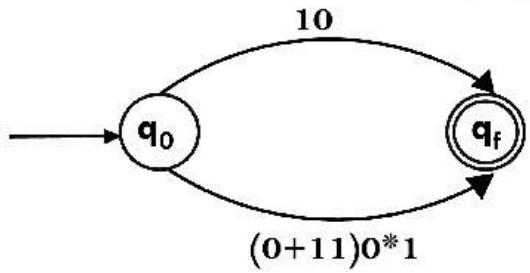
Design a FA from given regular expression 10 + (0 + 11)0* 1.

Solution: First we will construct the transition diagram for a given regular expression.

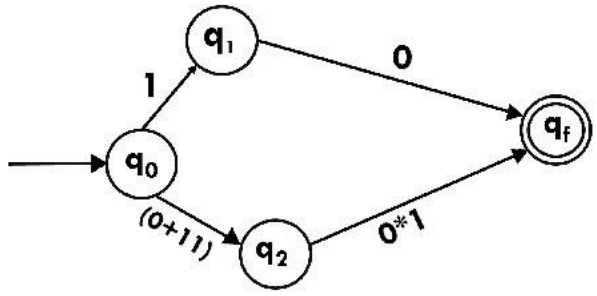
Step 1:



Step 2:



Step 3:



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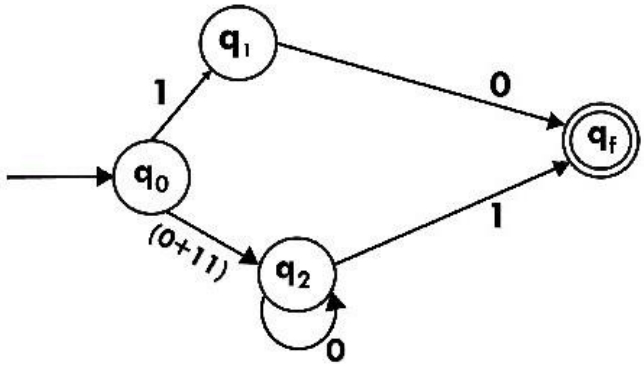

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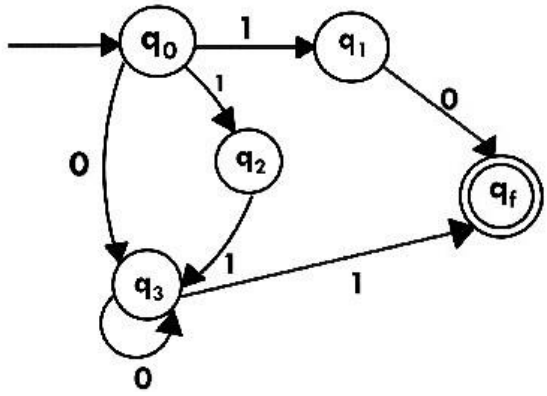


Now we have got NFA without ε. Now we will convert it into required DFA for that, we will first write a transition table for this NFA.

State	0	1

→q0	q3	{q1, q2}
q1	Qf	Φ
q2	Φ	q3
q3	q3	Qf
*qf	Φ	Φ

The equivalent DFA will be:

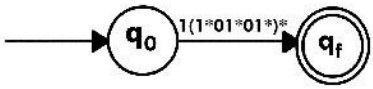
State	**0**	**1**
→[q0]	[q3]	[q1, q2]
[q1]	[qf]	Φ
[q2]	Φ	[q3]
[q3]	[q3]	[qf]
[q1, q2]	[qf]	[qf]
*[qf]	Φ	Φ

Example 2:

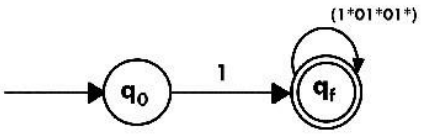
Design a NFA from given regular expression 1 (1* 01* 01*)*.

Solution: The NFA for the given regular expression is as follows:

Step 1:



Step 2:



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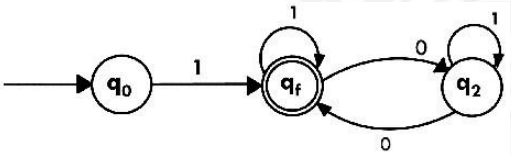


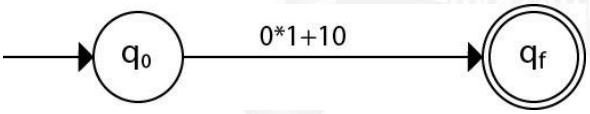
Example 3:

Construct the FA for regular expression 0*1 + 10.

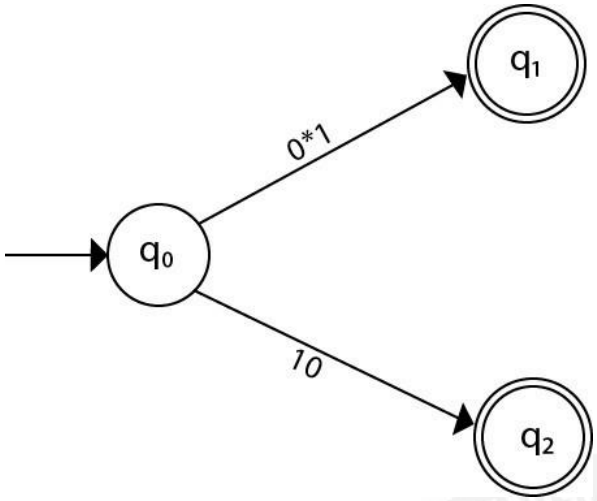
Solution:

We will first construct FA for R = 0*1 + 10 as follows:

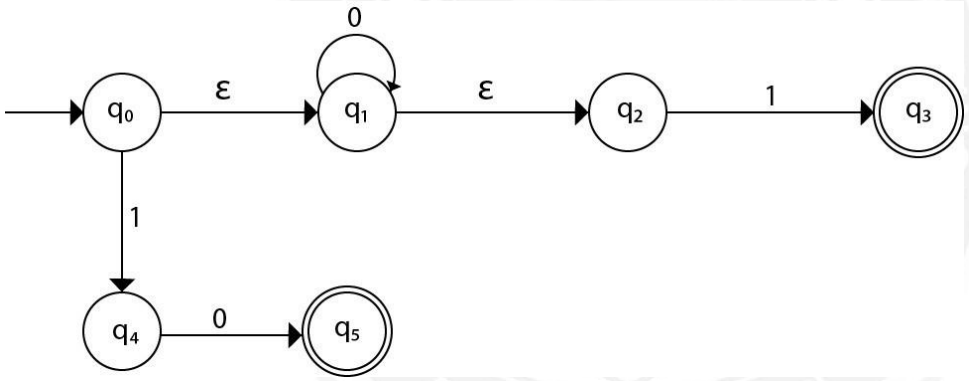
Step 1:



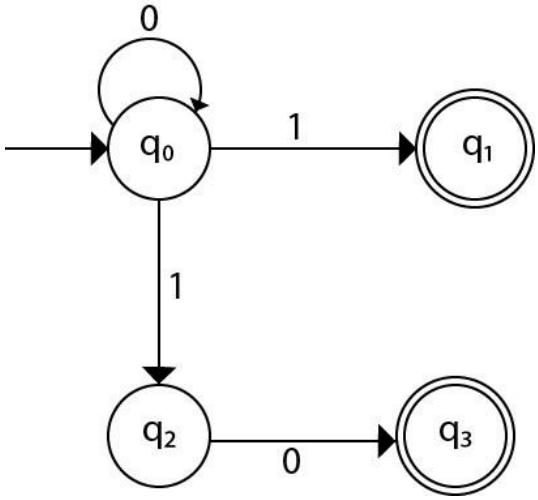
Step 2:



Step 3:



Step 4:



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