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SUBJECT: TOC ASSIGNMENTS

# LAB 1 assignment

Q. Design a machine that accepts three consecutive 1 over string 0 and 1.

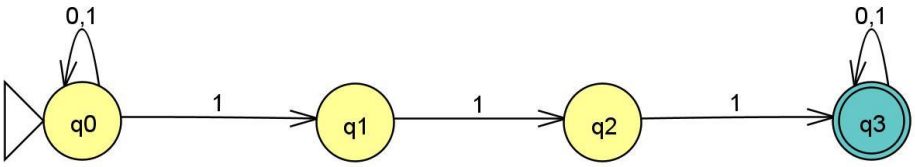
Ans. Regular expression for the statement will be :

R=(0+1)*111(0+1)*

Valid strings =0011100,111,1111100,01110,…..

Invalid strings=0110,0011,10110,…….

Now the construction for NFA will be :



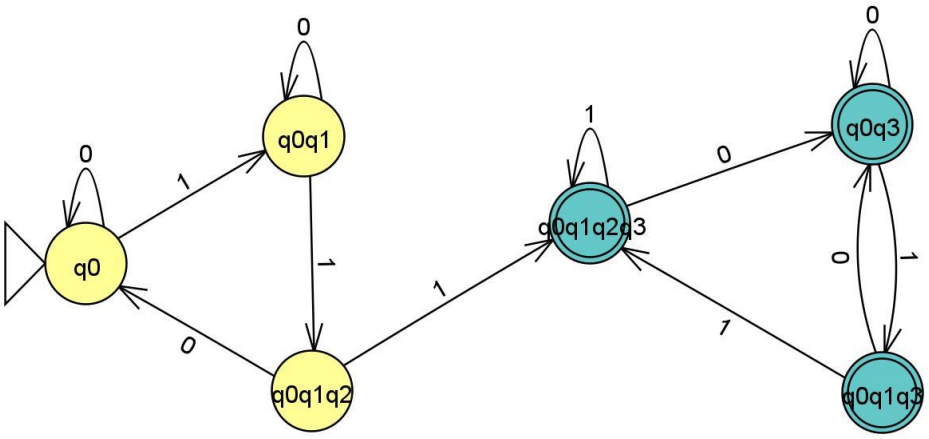

The state transition table for nfa will be:

| | 0 | 1 |
|---|---|---|
| ->Q0 | {q0} | {q0q1} |
| Q1 | { } | {q2} |
| Q2 | {} | {q3} |
| *Q3 | {q3} | {q3} |

Similarly stt for dfa would be:

| | 0 | 1 |
|---|---|---|
| [q0] | [q0] | [q0q1] |
| [q0q1] | [q0] | [q0q1q2] |
| [q0q1q2] | [q0] | [q0q1q2q3] |
| [q0q1q2q3] | [q0q3] | [q0q1q2qq3] |
| [q0q3] | [q0q3] | [q0q1q3] |
| [q0q1q3] | [q0q3] | [q0q1q2q3] |

Now finally the diagram of DFA:




# LAB 2 Assignment

Q. design a machine that accepts string always ending with 101.

Ans. Ans. Regular expression for the statement will be :

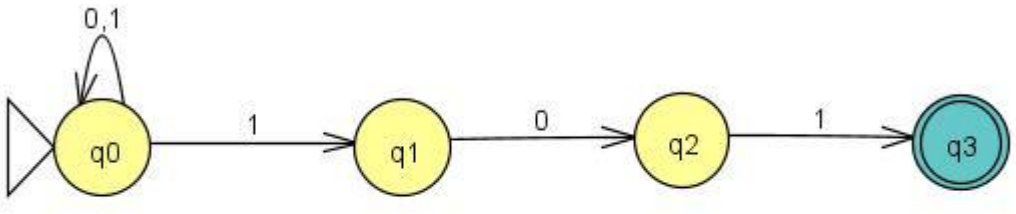
R=(0+1)*101

All the strings which are ending with ‘101’ will be included in this :

Valid strings =101,1101,00101,11101,…..

Invalid strings=0111,01010,0011,01011,…….

Now the construction for NFA will be:



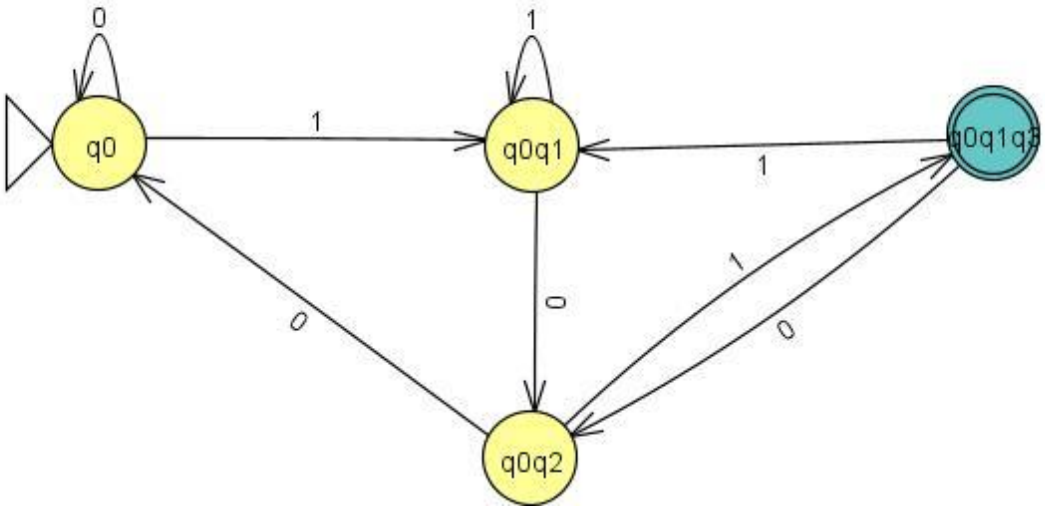

And now the table for NFA:

| | 0 | 1 |
|---|---|---|
| Q0 | {q0} | {q0q1} |
| Q1 | {q2} | { } |
| Q2 | { } | {q3} |
| Q3 | { } | { } |

And now the state transition table of DFA will be:

| | 0 | 1 |
|---|---|---|
| [q0] | [q0] | [q0q1] |
| [q0q1] | [q0q2] | [q0q1] |
| [q0q2] | [q0] | [q0q1q3] |
| [q0q1q3] | [q0q2] | [q0q1] |

DFA diagram is as follows:


0
1
q0
1
q0q1
1
0
1
0
0
q0q2