

Heaven's Light is our Guide



RAJSHAHI UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Computer science & Engineering

Lab-01

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Course no:CSE -2205

Roll no : 1503116

Lecturer

Experiment no: 1

Experiment name: DFA Deign.

Theory: In the theory of computation, a branch of theoretical computer science, a deterministic finite automaton (DFA)—also known as a deterministic finite acceptor (DFA) and a deterministic finite state machine (DFSM)—is a finite-state machine that accepts and rejects strings of symbols and only produces a unique computation (or run) of the automaton for each input string. Deterministic refers to the uniqueness of the computation.

The automaton takes a finite sequence of 0s and 1s as input. For each state, there is a transition arrow leading out to a next state for both 0 and 1. Upon reading a symbol, a DFA jumps deterministically from one state to another by following the transition arrow.

For example, if the automaton is currently in state S0 and the current input symbol is 1, then it deterministically jumps to state S1. A DFA has a start state (denoted graphically by an arrow coming in from nowhere) where computations begin, and a set of accept states (denoted graphically by a double circle) which help define when a computation is successful.

Code:

```
#include<bits/stdc++.h>

using namespace std;

vector<string>path;

int main() {

string a;

cout<<"Enter any string"<<endl;

cin>>a;

if(a.find("10")>=0 and a.find("10")<=a.size()) {
```

```

cout<<"Accepted\n";

path.push_back("q0");

string state="q0";

for(int i=0;i<a.size();i++) {

if(state=="q0" and a[i]=='0')

path.push_back("q0");

else if(state=="q0" and a[i]=='1') {

path.push_back("q2");

state="q2"; }

else if(state=="q2" and a[i]=='1')

path.push_back("q2");

else if(state=="q2" and a[i]=='0'){

path.push_back("q3");

state="q3"; }

else if(state=="q3")

path.push_back("q3"); }

cout<<"Path:\n";

cout<<path[0];

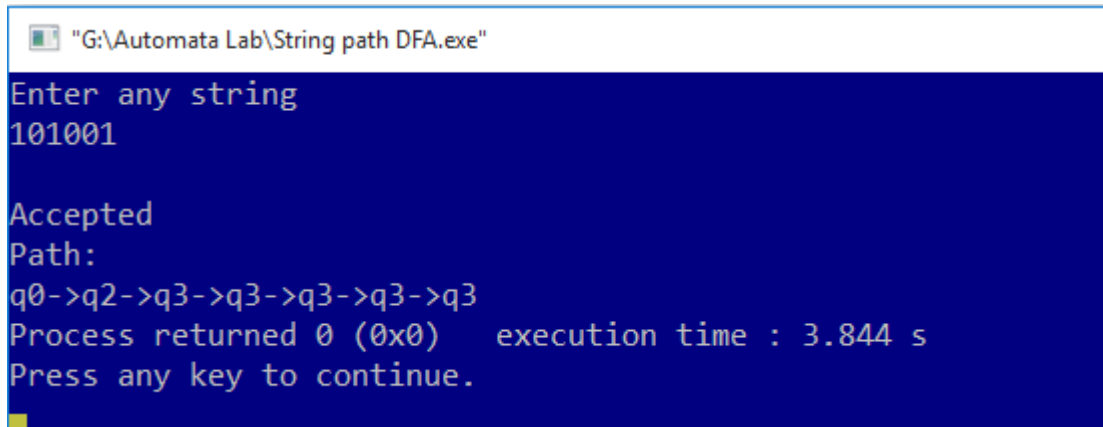
for(int i=1;i<path.size();i++)

cout<<"->"<<path[i]; }

else cout<<"Rejected"; }

```

Output:



```
"G:\Automata Lab\String path DFA.exe"
Enter any string
101001

Accepted
Path:
q0->q2->q3->q3->q3->q3->q3
Process returned 0 (0x0) execution time : 3.844 s
Press any key to continue.
```

Conclusions: For every input string check, is the string have the substring or not .Another if have the substring in the whole given input string then we find the path of the string .If path of the string is come to last then it is Accepted path else path is not right path.