Exp1: Write a program to implement a Deterministic Automation

Answer:

Source Code:

#include <iostream>

#include <sstream>

#include <string>

#include <fstream>

using namespace std;

string valid\_check(int dfa[][100], int final\_states[], int final\_states\_count, int initial\_state)

{

    string str;

    cout << "Enter string: ";

    cin >> str;

    int curr\_state = dfa[initial\_state][str[0] - '0'];

    int i = 1;

    while (i < str.size() && curr\_state != -1)

    {

        curr\_state = dfa[curr\_state][str[i++] - '0'];

    }

    for (i = 0; i < final\_states\_count; i++)

    {

        if (final\_states[i] == curr\_state)

            return "ACCEPTED";

    }

    return "NOT ACCEPTED";

}

int main()

{

    ifstream file;

    int final\_states[100], dfa[100][100], final\_states\_count = 0, initial\_state;

    file.open("./DFA.txt");

    int n = 0, m = 0;

    bool counting = true;

    string str, temp;

    getline(file, str);

    initial\_state = stoi(str);

    getline(file, str);

    stringstream X(str);

    while (getline(X, temp, ' '))

    {

        final\_states[final\_states\_count++] = stoi(temp);

    }

    while (getline(file, str))

    {

        stringstream X(str);

        m = 0;

        while (getline(X, temp, ' '))

        {

            dfa[n][m++] = stoi(temp);

        }

        n++;

    }

    cout << valid\_check(dfa, final\_states, final\_states\_count, initial\_state);

    return 0;

}

File Input:

0

2 4

1 2

-1 4

3 -1

1 4

3 2

Output:

Text

Description automatically generated