**Problem Statement 3:** Write a C Program to implement Deterministic Finite Automata (DFA) which accepts a set of input strings.

**Input:** DFA Parameters

Input String

**Output expected:** Whether the string is accepted or not.

**Description of problem statement:** This program is to implement Deterministic Finite Automata (DFA) which accepts a set of input strings.

## Algorithm:

Step 1: Start

Step 2: Read the input string which is to be checked whether it is accepted or not. Step 3: DFA Simulation:

Step 3.1: Initialize a variable cs for current state to the initial state. Step 3.2 : For each character in the input string.

Step 3.2.1: Find the index of each character in the array of input symbols. Step 3.2.2 : Update cs using the transition functions

Step 4: After simulating the DFA on the entire input string, check if the final current state i.e. cs is in the set of accepting states. If it is ,then the input string is accepted by DFA otherwise it is rejected.

Step 5: Print whether the input string was accepted or rejected by the DFA. Step 6: Stop

## CODE:-

#include <stdio.h>

#include <stdlib.h>

#include <string.h>

#define max 100

int main() {

int i, j, n, m, o, q[max], ia[max], is, fs[max], tf[max][max], ch, cs;

char in[max];

printf("enter the no of states");

scanf("%d", &n);

if (n == 0) {

printf("error");

exit(0);

} else {

printf("enter the states name");

for (i = 0; i < n; i++) {

scanf("%d", &q[i]);

}

}

printf("enter the no of input alphabet");

scanf("%d", &m);

if (m == 0) {

printf("error");

exit(0);

} else {

printf("enter the alphabet name");

for (i = 0; i < m; i++) {

scanf("%d", &ia[i]);

}

}

printf("enter the initial state");

scanf("%d", &is);

if (is >= n) {

printf("error");

exit(0);

}

printf("enter the no of final states");

scanf("%d", &o);

if (o >= n) {

printf("error");

exit(0);

} else {

for (i = 0; i < o; i++) {

scanf("%d", &fs[i]);

if (fs[i] >= n) {

printf("error");

exit(0);

}

}

}

for (i = 0; i < n; i++) {

for (j = 0; j < m; j++) {

printf("enter the state at tf[%d][%d]", i, j);

scanf("%d", &tf[i][j]);

if (tf[i][j] >= n) {

printf("error");

exit(0);

}

}

}

printf("enter the input string");

scanf("%s", in);

cs = is;

puts(in);

for (i = 0; i < strlen(in); i++) {

ch = in[i];

ch = ch - 48;

cs = tf[cs][ch];

}

printf("the current state is=%d", cs);

for (i = 0; i < o; i++) {

if (cs == fs[i]) {

printf("\nsting accepted");

exit(0);

}

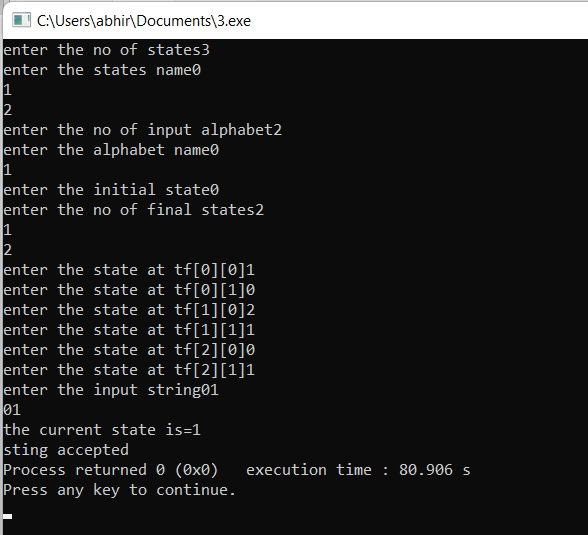
}

printf("\nstring rejected");

return 0;

}

**OUTPUT:**

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