Name: Naseem Shah	**Roll No:** 058
Exp. No: 03 07/09/2021	**Date:**

DFA Implementation of (1+0)*00

Aim: Write a C program to implement a DFA accepting binary strings ending with ‘00

```
/*
C program to implement a DFA accepting binary strings ending with '00'.
*/

#include <stdio.h>
#include <stdbool.h>
#include <string.h>

const int transition_table[][2] = {
    {1, 0},     // state 0, initial state
    {2, 0},     // state 1
    {2, 0},     // state 2, final state
    {3, 3}      // dead state
};

const int final_state[] = {2};
const int num_final_states =
sizeof(final_state)/sizeof(final_state[0]);

void main() {
    char s[1000];
    bool valid = false;
    int state = 0;
    printf("input string : ");
    scanf("%s", s);

    for(int i=0; s[i] != '\0' ; i++){
        if(s[i] != '0' && s[i] != '1')
            state = 3;

        if(state == 3)
            break;

        state = transition_table[state][s[i] - '0'];
```

```
    }

    for(int i=0; i<num_final_states; i++)
        if(state == final_state[i]){
            valid = true;
            break;
        }

    if(valid)
        printf("Valid string!\n");
    else
        printf("Invalid string!\n");

    return;
}
```

Result: Successfully written C program to implement a DFA accepting binary strings ending with ‘00

Remarks:(To be filled by faculty)

Algorithm

1. Start
2. Create a NFA, and then DFA for the given regular expression, (0+1)*00.
3. Create transition table, transition_table[][], for the DFA obtained where each transition_table[i][j] denotes the current state i, and the next state when input is j. transition_table[4][2]= { {1,0}, {2,0}, {2, 0}, {3,3} }
4. Set final_states = {2}
5. Read the input string, s
6. Set state = 0, valid = false
7. for each character ch in s, do
    a. if ch != ‘0’ and ch != ‘1’, then state = 3
    b. if state = 3, then break
    c. state = transition_table[state][ch - ‘0’]
8. for i in final_states, do
    a. if i == state, then
        i. valid = true
        ii. break
9. if valid == true, then print “Valid string”, else print “Invalid string”
10. Stop

Diagrams & Tables

NFA

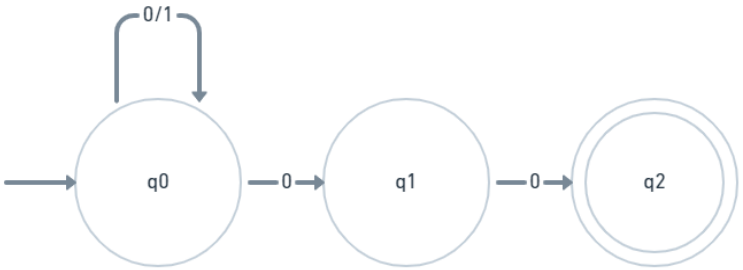


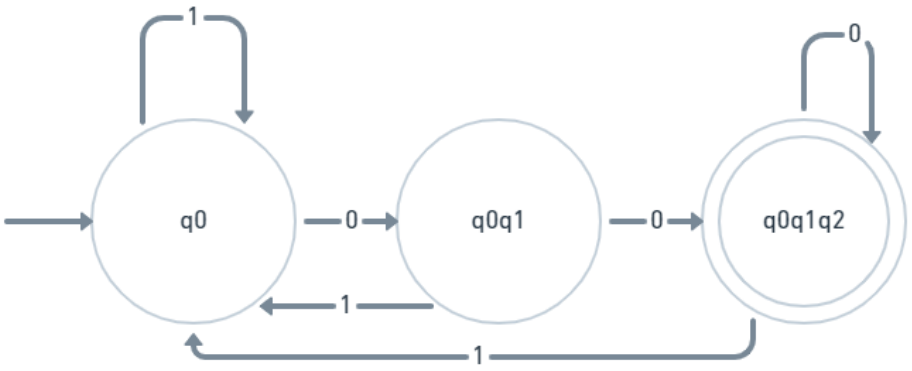
Table for NFA

State	0	1
q0	{q0, q1}	q0
q1	q2	ϕ
q2	ϕ	ϕ

Table for DFA

State	0	1
q0	[q0q1]	q0
[q0q1]	[q0q1q2]	q0
[q0q1q2]	[q0q1q2]	q0

DFA



Sample output

```
root@Naseem-Laptop:/mnt/d/Coding/LanguageLab/EXP3# ls
exp3.c
root@Naseem-Laptop:/mnt/d/Coding/LanguageLab/EXP3# gcc exp3.c
root@Naseem-Laptop:/mnt/d/Coding/LanguageLab/EXP3# ./a.out
input string : 11.
Invalid string!
root@Naseem-Laptop:/mnt/d/Coding/LanguageLab/EXP3# ./a.out
input string : 00
Valid string!
root@Naseem-Laptop:/mnt/d/Coding/LanguageLab/EXP3#
```