Name:M.Sri Krishna Kumar
Roll No: AP18110010506
Class &Sec: CSE-H

Program-2

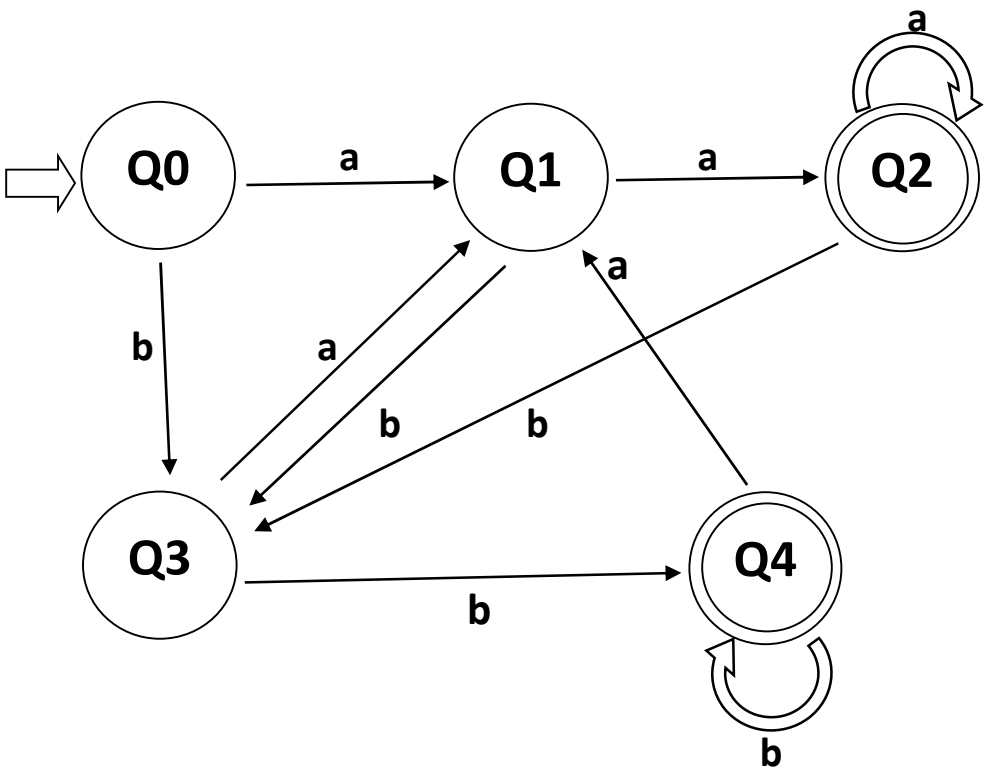
Implementation of Language recognizer for set of all strings ending with two symbols of same type.

Description

Let the alphabet be ∑={a,b}

The strings that are been accepted by the language are aa, bb, ababaa, baa, abbb,baabbb etc.

The Deterministic Finite Automata (DFA) for the given language is:



A DFA is a five tuple. Let M be the name of DFA,

M= (Q,∑,δ,Q0,F) where,

Q=Set of all states ={Q0,Q1,Q2,Q3,Q4},

∑=Input Alphabet={a,b},

Start state is Q0

F=Set of all final States={Q2,Q4} and

δ= Transition Function is as follows:

States	a	b
Q0	Q1	Q3
Q1	Q2	Q3
Q2	Q2	Q3
Q3	Q1	Q4
Q4	Q1	Q4

Algorithm

Input:

input //input string

Output:

Algorithm prints a message

"String accepted": If the input is acceptable by the language,

"String not accepted" otherwise,

"Invalid token": If the input string contains symbols other than input alphabet.

Method

```
state=0 //initial state
while((current=input[i++])!='\0')
{
    switch(state)
       case 0: if(current=='a') state=1;
                   else if(current=='b') state=3;
                   else
                        Print "Invalid string input";
```

```
            exit;
            case 1: if(current=='a') state=2;
                    else if(current=='b') state=3;
                     else
                         Print "Invalid string input";
            exit; case 2: if(current=='a') state=2;
                    else if(current=='b') state=3;
                    else
                         Print "Invalid string input";
            exit; case 3: if(current=='a') state=1;
                    else if(current=='b') state=4;
                    else
                       Print "Invalid string input"; exit;
           case 4: if(current=='a') state=1;
                    else if(current=='b') state=4;
                    else
                       Print "Invalid string input"; exit;
       end switch
   end while
}
 //Print
 output
 if(state==2
 || state==4)
       Print ”String is accepted”
else
       Print ”String is not accepted”
```

Code for the given language in C

```
#include<stdio.h>
#include<stdlib.h>
int main()
{
char input[100],current;
printf("Enter the input string:");
scanf("%s",input);
int i=0,state=0;
while((current=input[i++])!='\0')
{
    switch(state)
    {
```

```
case 0:
if(current=='a')
state=1;
else if(current=='b')
state=3;
else
{
    printf("Invalid string input");
    exit(1);
}
break;
case 1:
if(current=='a')
state=2;
else if(current=='b')
state=3;
else
{
    printf("Invalid string input");
    exit(1);
}
break;
case 2:
if(current=='a')
state=2;
else if(current=='b')
state=3;
else
{
    printf("Invalid string input");
    exit(1);
}
break;
case 3:
if(current=='a')
state=1;
else if(current=='b')
state=4;
else
{
    printf("Invalid string input");
    exit(1);
}
```

```
        break;
        case 4:
        if(current=='a')
        state=1;
        else if(current=='b')
        state=4;
        else
        {
            printf("Invalid string input");
            exit(1);
        }
        break;
    }
}
if(state==2 || state==4)
printf("String is accepted");
else
printf("String is not accepted");
return 0;
}
```

Sample Inputs and their Outputs

Sample Inputs	Outputs
aabb	String is accepted
bbabbaa	String is accepted
abbba	String is not accepted
aacbb	Invalid string input
babab	String is not accepted

Conclusion

Hence, a language recognizer has been implemented that recognizes the set of all strings ending with two symbols of same type.