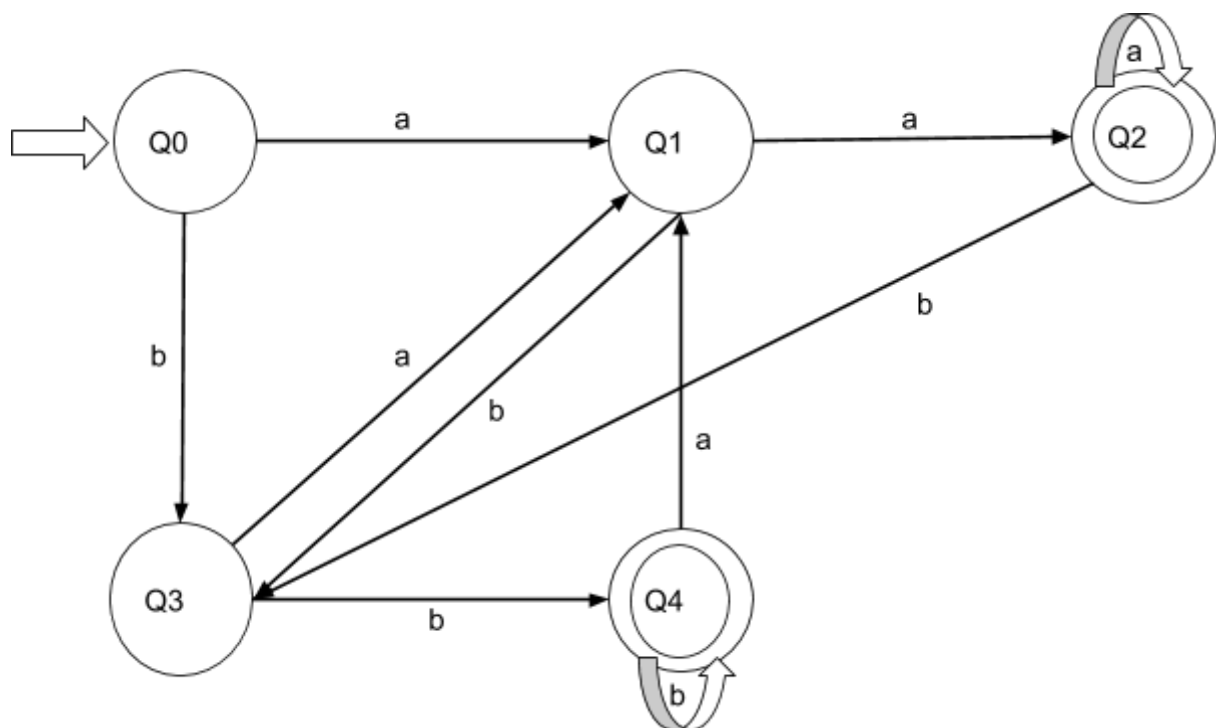**PROGRAM-2:**

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

DESCRIPTION:

Let the alphabet be $\sum$={a,b}
The strings that are 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 D be the name of DFA;
D= (Q,$\sum$,δ,Q0,F) where,
Q=Set of all states ={Q0,Q1,Q2,Q3,Q4}
$\sum$=Input Alphabet={a,b}
Start state is Q0
F=Set of all final States={Q2,Q4}

δ= Transition Function is as follows:

State	a	b
Q0	Q1	Q3
Q1	Q2	Q3
Q2	Q2	Q3
Q3	Q1	Q4
Q4	Q1	Q4

ALGORITHM:

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 the 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"
```

C LANGUAGE CODE FOR GIVEN LANGUAGE:

```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)
    {
```

```c
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;
}
```

TEST CASES:

INPUT	OUTPUT
aa	String is accepted
abab	String is not accepted
abaaa	String is accepted
abaab	String is not accepted
baabaa	String is accepted
abcd	Invalid string input

CONCLUSION:

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