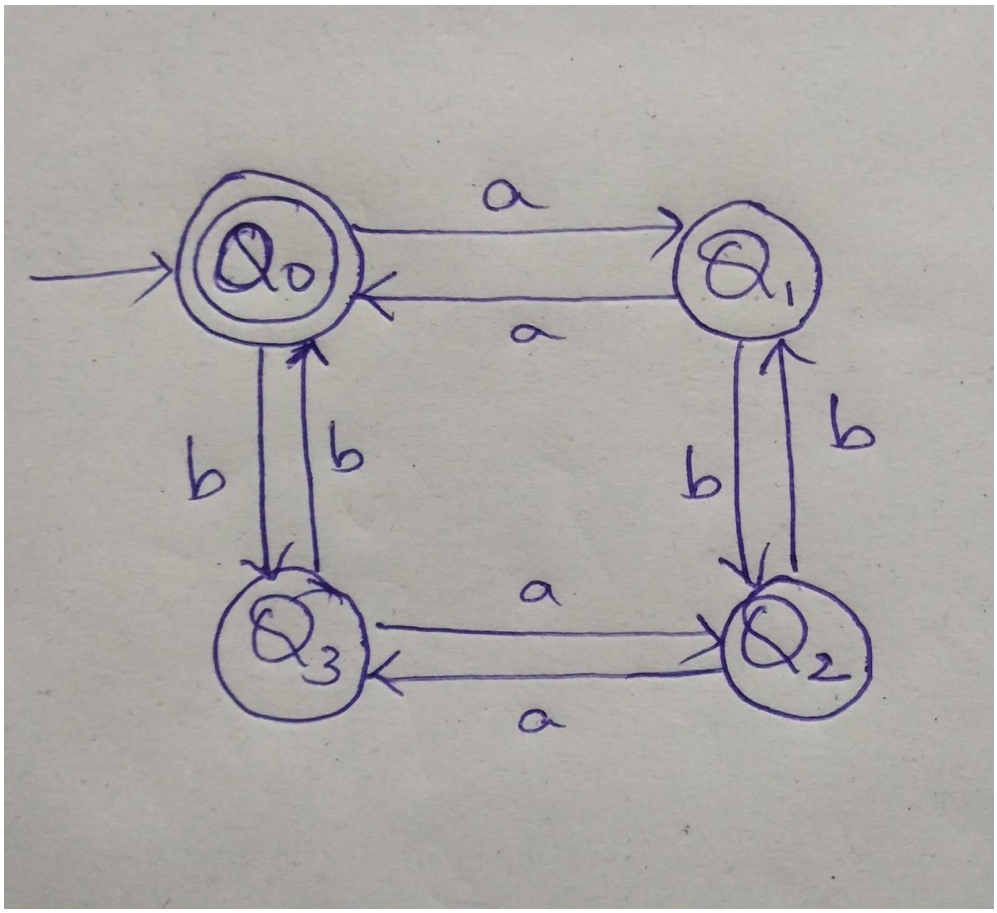
Implementation of Language recognizer for set of all strings over input alphabet ∑={a,b} containing even number of a's and even number of b's.

Description:

The acceptable strings of the language are ε(Null string), aa, bb, abba, babbab etc.
Deterministic Finite Automata for the given language is given below:
DFA M=(Q,∑,δ,Q0,F) Where
Q=Set of all states ={Q0,Q1,Q2,Q3}
∑=Input Alphabet={a,b},
Start state is Q0
F=Set of all final States={Q0}
And the transitions are defined in the transition diagram



Algorithm: Language recognizer

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

C code:

```
#include<stdio.h>                                   /*Libraries*/
#include<stdlib.h>                                  /*Libraries*/
void main(){                                        /*Denotes the main function*/.
int a=0,b=0;                        /*"a" is for state of the variable and "b" ito hold state of input character*/
char c,d[20];                 /"c"  holds current input and "d" is input array to hold the entire string*/
printf("Enter input string :");                     /* printf statement to enter the input string*/
scanf("%s",d);                                      /*scanf statement to read the input */
while((c=d[b++])!='\0'){                  /* to read character by character from the input string*/
switch(a)                                           /*switch case for current state of the input string*/
{
case 0: if(c=='a')                                  /*case 0 is for first state(q0)*/
a=1;
else if(c=='b')
a=2;
else
{
printf("Invalid token");
exit(0);
}
break;
case 1: if(c=='a')                                  /*case 1 is for second state(q1)*/
a=0;
else if(c=='b')
a=3;
else
{
printf("Invalid token");
exit(0);
}
break;
case 2: if(c=='a')                                  /*case 2 is for third state(q2)*/
a=3;
else if(c=='b')
a=0;
else
{
printf("Invalid token");
exit(0);
}
```

```
break;
case 3: if(c=='a')                    /*case 3 is for fourth state(q3)*/
a=2;
else if(c=='b')
a=1;
else
{
printf("Invalid token");
exit(0);
}
break;
}
}                                     /*while loop ended*/
if(a==0)                  /*denotes the final state is still zero then the string is accepted*/
printf("\nString accepted");
else                      /*denotes the final state is still zero then the string is accepted*/
printf("\nString not accepted");
}
```