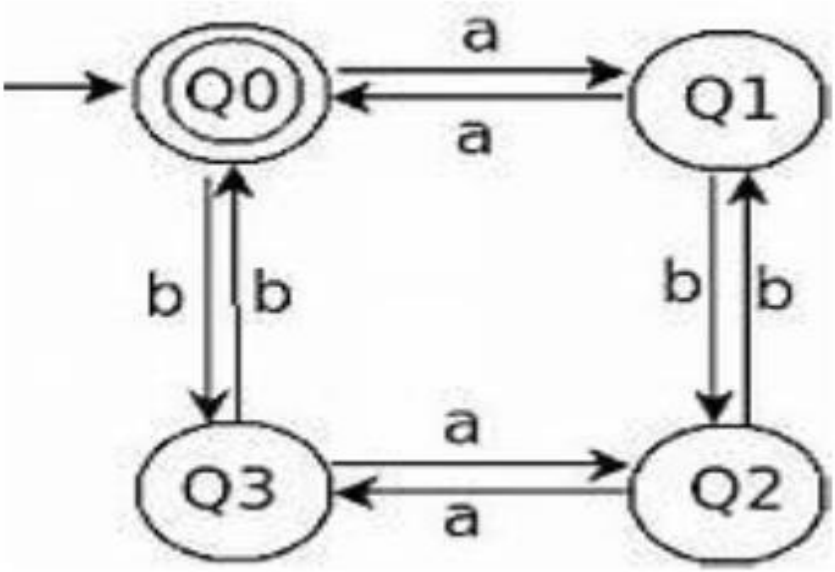
Compiler Design Lab (CS 306)

Week 1: Implementation of Language recognizer

1.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.

DFA:



1.M= (Q, ∑, δ, Q0, F)
2.Q=Set of all states = {Q0, Q1, Q2, Q3}

3. ∑=Input Alphabet = {a,b}

4.Start state is Q0

5.F= final States= {Q0} And the transitions are defined in the transition diagram

Examples:

accepted strings:- aabb, abab,bbaa.

CODE:

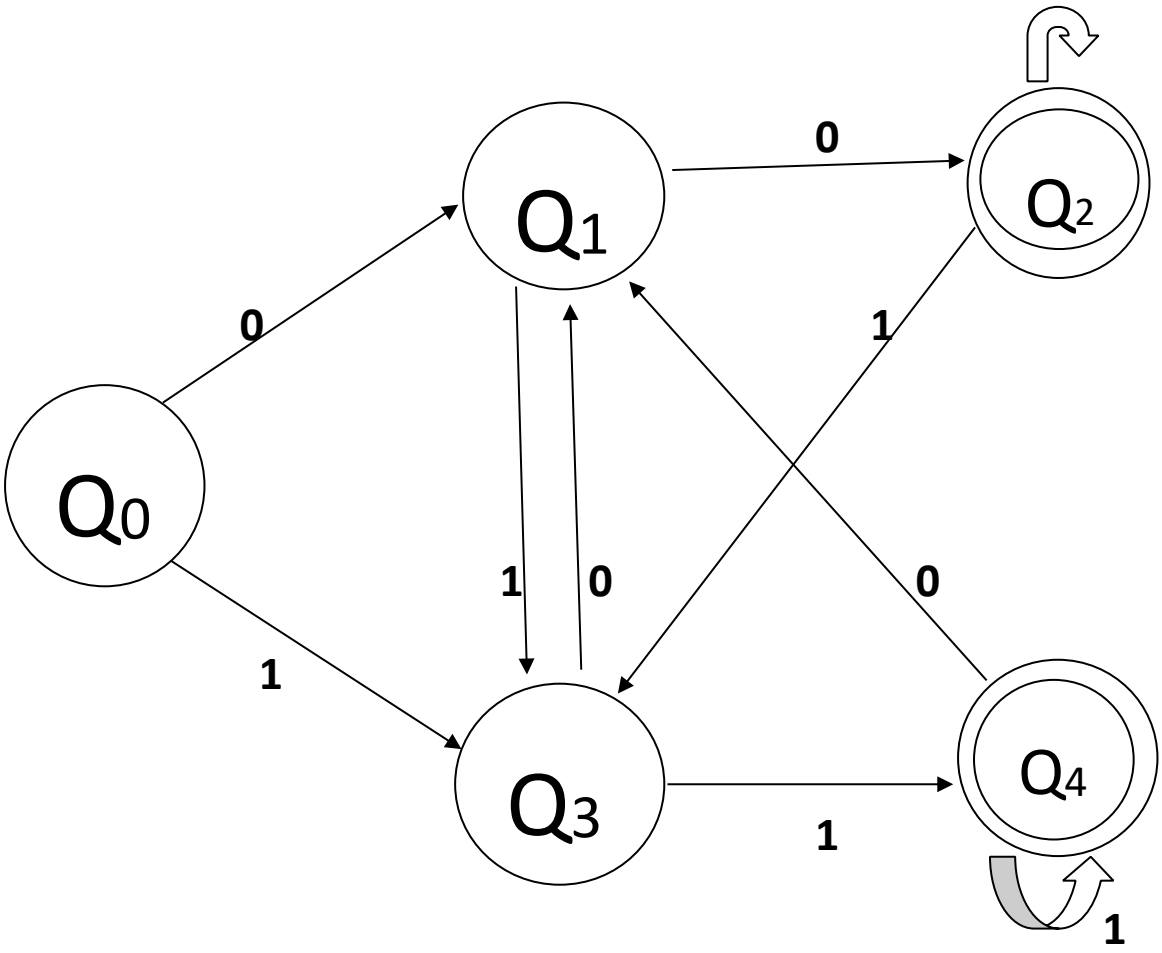
```
#include<stdio.h>
void main()
{
int state=0,i=0;char current,input[20];
printf("Enter input string \t:");
scanf("%s",input);
while((current=input[i++])!='\0')
{
switch(state)
{
case 0: if(current=='a')
state=1;
else if(current=='b')
state=2;
else{
```

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

```
exit(0);
}
break;
case 3: if(current=='a')
state=2;
else if(current=='b')
state=1;
else
{
printf("Invalid token");
exit(0);
}
break;
}
}
if(state==0)
printf("String accepted\n");
else
printf("String not accepted\n");}
```

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

DFA:



Example:

accepted strings:-aabb,bbaa,abbb,aaaa,bbbb,etc.

DFA
1.M= (Q, ∑, δ, Q0, F)
2.Q=Set of all states = {Q0, Q1, Q2, Q3, Q4}

3. ∑=Input Alphabet = {0,1}

4.Start state is Q0

5.F=Set of all final States= {Q2and Q4} And the transitions are defined in the transition diagram

CODE:

```
#include<stdio.h>
void main(){
int state=0,i=0;
char current,input[20];
printf("Enter input string \t :");
scanf("%s",input);
while((current=input[i++])!='\0'){
switch(state)
{
case 0: if(current=='a')
state=1;
else if(current=='b')
state=3;
else
{
```

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

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

exit(0);
}
break;
case 4: if(current=='a')
state=1;
else if(current=='b')
state=4;
else
```

```
{
printf("Invalid token");
exit(0);
}
break;
}
}
if(state==2||state==4)
printf("String accepted\n");
else
printf("String not accepted\n");
}
```