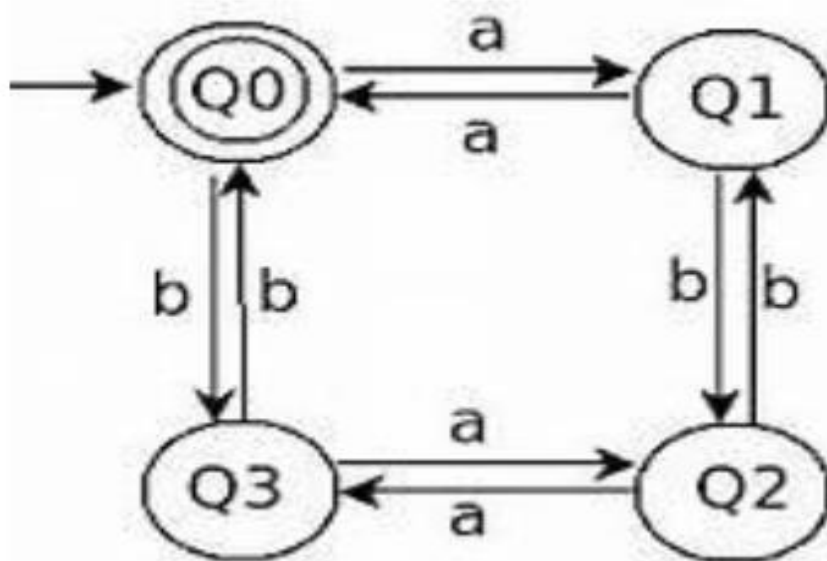


Compiler Design Lab (CS 306)

Week 1: Implementation of Language recognizer

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

DFA:



1. $M = (Q, \Sigma, \delta, Q_0, F)$
2. $Q = \text{Set of all states} = \{Q_0, Q_1, Q_2, Q_3\}$
3. $\Sigma = \text{Input Alphabet} = \{a, b\}$
4. Start state is Q_0

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

Examples:

accepted strings:- aabb, abab, bbaa.

CODE:

```
#include<stdio.h>

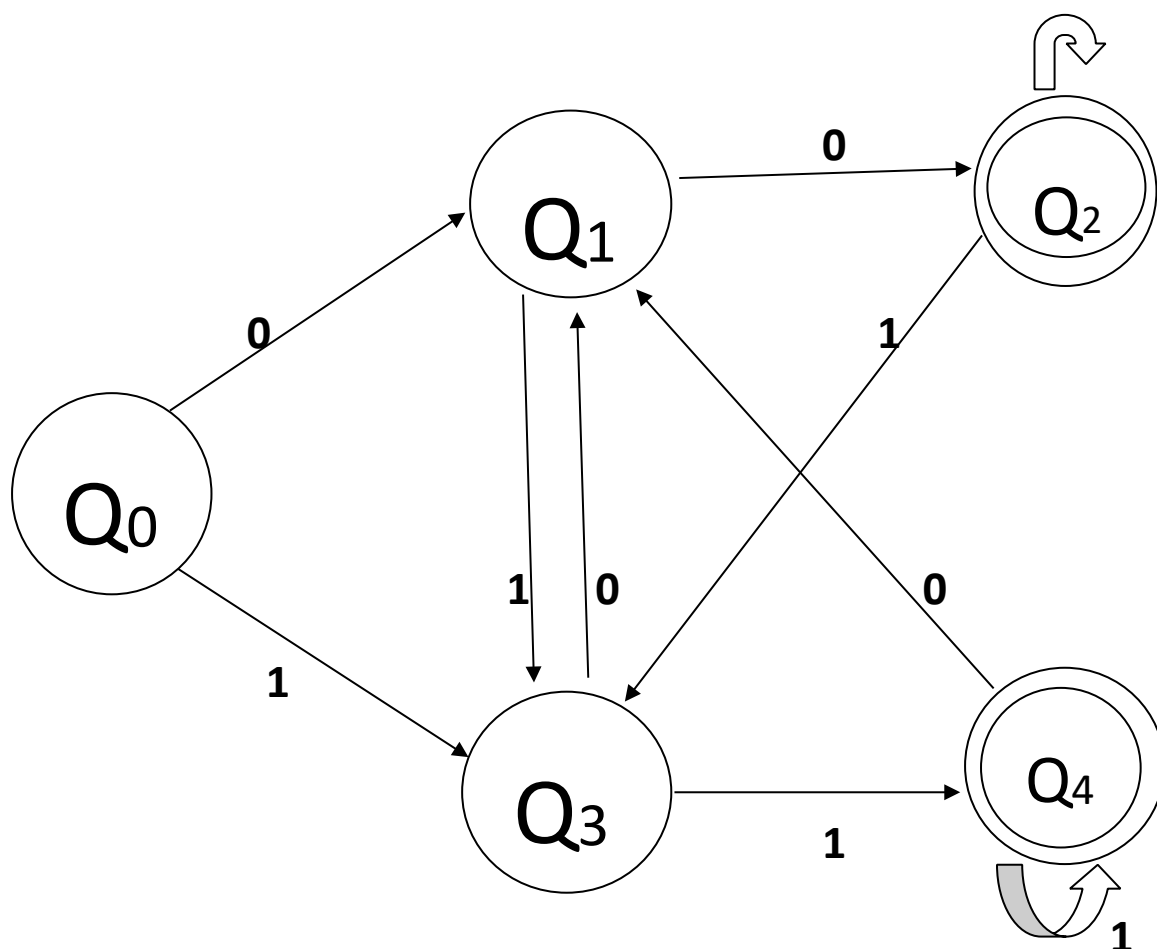
void main()
{
int state=0,i=0;char current,input[20];
printf("Enter input string \t:");
scanf("%s",input);
while((current=input[i++])!='\0')
{
switch(state)
{
case 0: if(current=='a')
state=1;
else if(current=='b')
state=2;
else{
```

```
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. $M = (Q, \Sigma, \delta, Q_0, F)$

2. $Q = \text{Set of all states} = \{Q_0, Q_1, Q_2, Q_3, Q_4\}$

3. Σ =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");  
}
```