

NAME:- Sourav Paul

GROUP:- D2

REG. NO:- 20214056

BRANCH:- CSE DEPT.

ASSIGNMENT - 02

1). Consider the strings on {a,b} defined by the requirements below. For each, construct an accepting DFA.

a)All strings with exactly one 'a'.

Ans:-

```
#include <iostream>
```

```
#include<bits/stdc++.h>
```

```
using namespace std;
```

```
int main()
```

```
{
```

```
    char ch;
```

```
    int counta = 0;
```

```
    cout << "Enter the String : " ;
```

```
    while(ch = getchar())
```

```
    {
```

```
        if(ch == '\n')
```

```
            break;
```

```
        if(ch == 'a')
```

```
            counta++;
```

```
}
```

```
if(counta == 1)
cout <<"Accepted" << endl;
else
cout <<"Rejected" << endl;
```

```
return 0;
```

```
}
```

/*OUTPUT

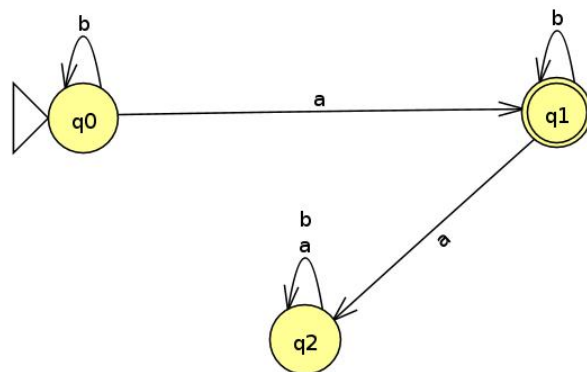
Enter the String : a

Accepted

Enter the String : aa

Rejected

Transition diagram



b). All strings with at least one 'a'.

```
Ans:- #include <iostream>  
#include<bits/stdc++.h>  
using namespace std;
```

```
int main()  
{  
    char ch;  
    int counta = 0;  
    cout << "Enter the String : ";  
    while(ch = getchar())  
    {  
        if(ch == '\n')  
            break;  
        if(ch == 'a')  
            counta++;  
    }
```

```
    if(counta >= 1)  
        cout <<" Accepted" << endl;  
    else  
        cout <<" Rejected" << endl;
```

```
    return 0;  
}
```

/*OUTPUT

Enter the String : aaaaab

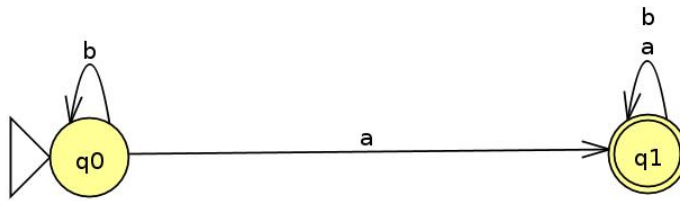
Accepted

Enter the String : bbbbb

Rejected

***/**

Transition diagram



c). All strings with no more than three 'a's.

Ans:- int main()

{

char ch;

int counta = 0;

cout << "Enter the String : ";

while(ch = getchar())

{

if(ch == '\n')

break;

if(ch == 'a')

counta++;

}

if(counta <= 3)

cout << "Accepted" << endl;

else

cout << "Rejected" << endl;

```
    return 0;  
}
```

/*OUTPUT

Enter the String : a

Accepted

Enter the String : aaab

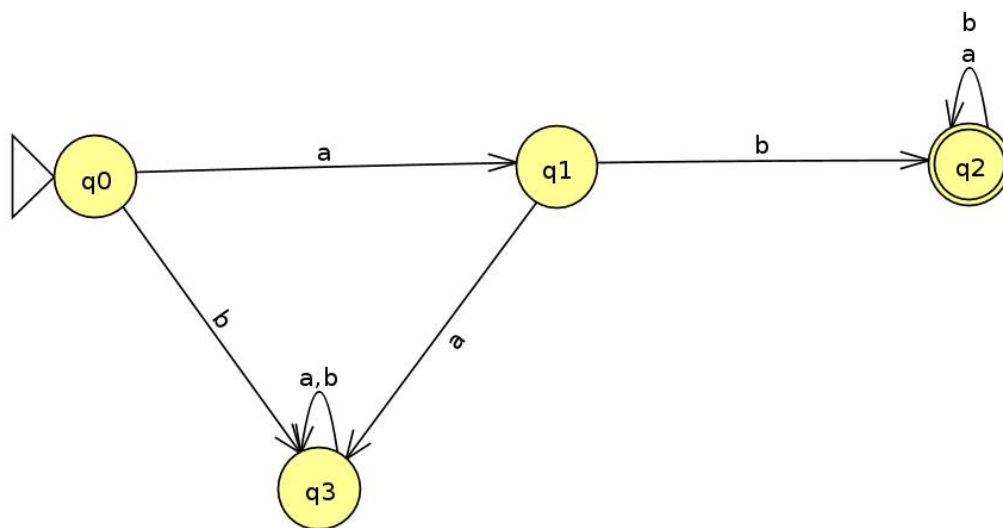
Accepted

Enter the String : aaabaab

Rejected

***/**

Transition diagram



d). All strings with at least one 'a' and exactly two 'b's.

Ans:- `int main()`

```
{
    char ch;
    int counta = 0, countb = 0;
    cout << "Enter the String : ";
    while(ch = getchar())
    {
        if(ch == '\n')
            break;
        if(ch == 'a')
            counta++;
        if(ch == 'b')
            countb++;
    }

    if(counta >= 1 && countb == 2)
        cout << "Accepted" << endl;
    else
        cout << "Rejected" << endl;

    return 0;
}
```

/*OUTPUT

Enter the String : abbaa

Accepted

Enter the String : aabb

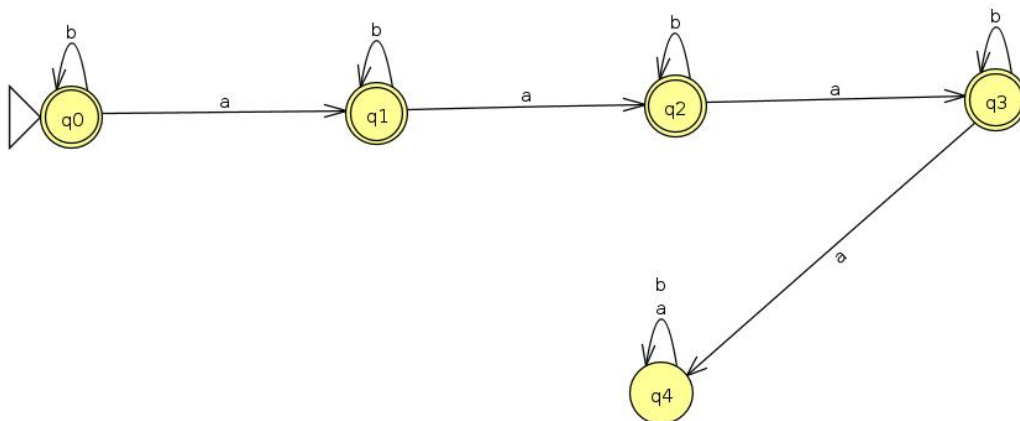
Accepted

Enter the String : aabbbab

Rejected

***/**

Transition diagram



e) All strings with exactly two 'a's and more than two 'b's.

Ans:- `int main()`

`{`

`char ch;`

`int counta = 0, countb = 0;`

`cout << "Enter the String : ";`

`while(ch = getchar())`

`{`

`if(ch == '\n')`

`break;`

`if(ch == 'a')`

```

    counta++;
    if(ch == 'b')
        countb++;
}

```

```

if(counta == 2 && countb > 2)
    cout <<"Accepted" << endl;
else
    cout <<"Rejected" << endl;

```

```

return 0;
}

```

/*OUTPUT

Enter the String : aabbb

Accepted

Enter the String : aaabbb

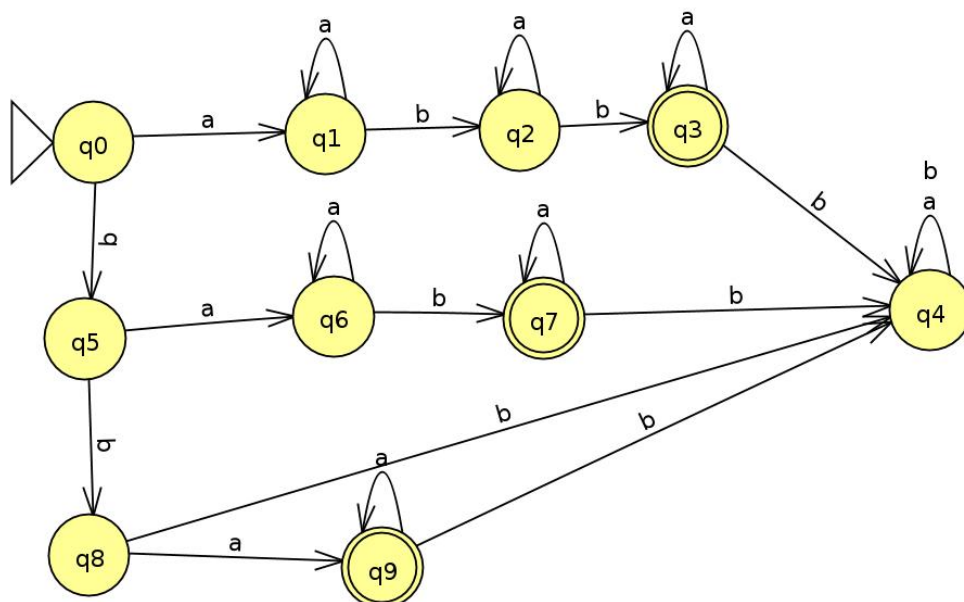
Rejected

Enter the String : aabb

Rejected

***/**

Transition diagram



2) Construct the dfa that accept all the strings 'a' or 'b' where every string start with:

a) ab

```
Ans:- int main()
{
    char ch1,ch2;
    bool flag = false;
    cout << "Enter the String : ";
    ch1 = getchar();
    if(ch1 != '\n')
        ch2 = getchar();

    if(ch1 == 'a' && ch2 == 'b')
        flag = true;

    if(flag)
        cout <<"Accepted" << endl;
    else
        cout <<"Rejected" << endl;

    return 0;
}
```

/*OUTPUT

Enter the String : abbaaba

Accepted

Enter the String : babbb

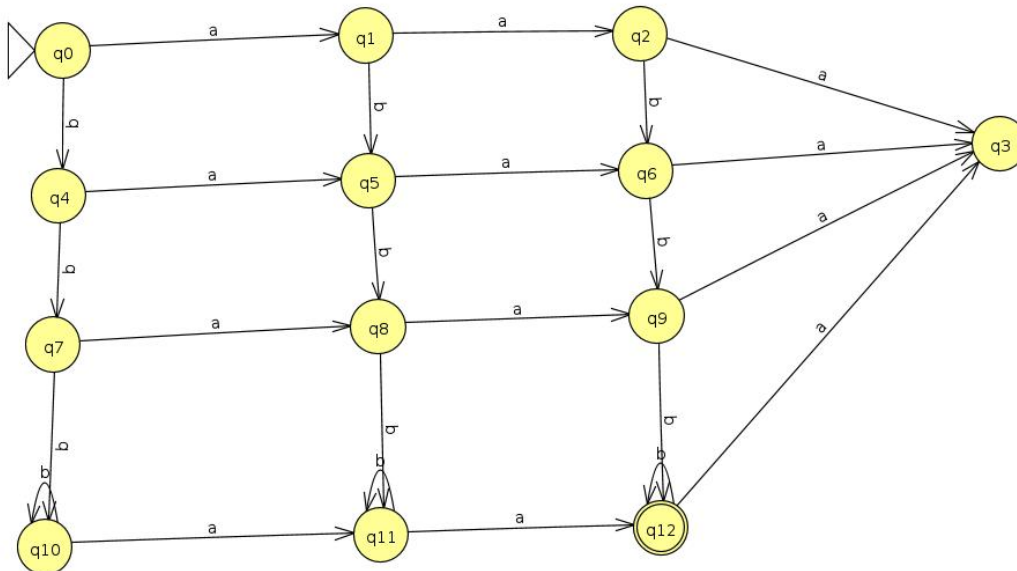
Rejected

Enter the String : bbaa

Rejected

***/**

Transition diagram



b) ba

Ans:- int main()

{

char ch1,ch2;

bool flag = false;

cout << "Enter the String : ";

ch1 = getchar();

if(ch1 != '\n')

ch2 = getchar();

if(ch1 == 'b' && ch2 == 'a')

flag = true;

if(flag)

cout << "Accepted" << endl;

```
else  
cout <<"Rejected" << endl;
```

```
return 0;  
}
```

/*OUTPUT

Enter the String : baabab

Accepted

Enter the String : ababab

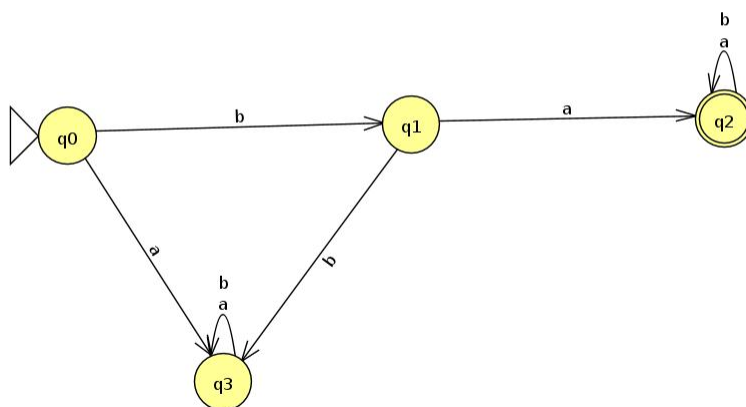
Rejected

Enter the String : aabbbbb

Rejected

***/**

Transition diagram



c) bb

Ans:- int main()

```
{  
    char ch1,ch2;  
    bool flag = false;  
    cout << "Enter the String : ";  
    ch1 = getchar();  
    if(ch1 != '\n')  
        ch2 = getchar();  
  
    if(ch1 == 'b' && ch2 == 'b')  
        flag = true;  
  
    if(flag)  
        cout << "Accepted" << endl;  
    else  
        cout << "Rejected" << endl;  
  
    return 0;  
}
```

/*OUTPUT

Enter the String : bbbaaa

Accepted

Enter the String : abbabb

Rejected

Enter the String : aabababbb

Rejected

***/**

Transition diagram

