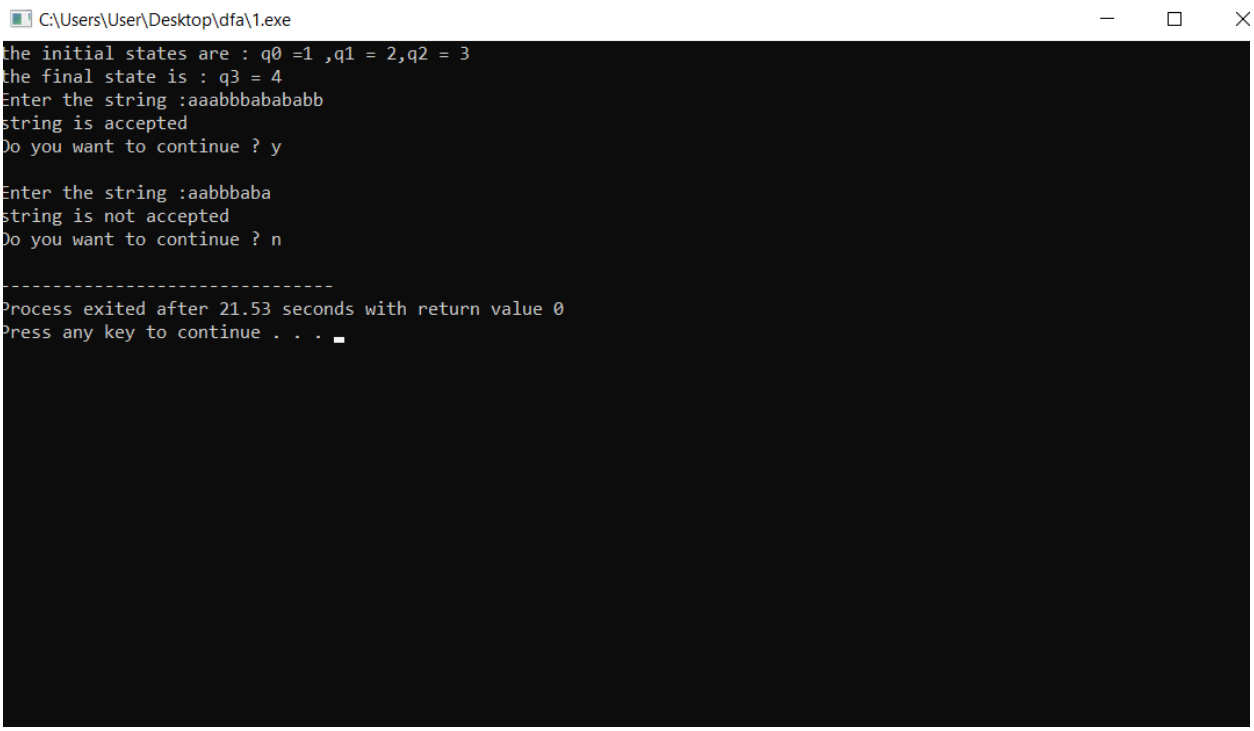
```
//1.  Construct DFA over {a,b} that accepts the strings ending with abb.
#include<stdio.h>
#include<stdlib.h>
#define max 100
int main()
{
char str[max];
        char c;
        int i;
        int f ='1';
        printf("the initial states are : q0 =1 ,q1 = 2,q2 = 3 ");
        printf("\nthe final state is : q3 = 4 ");
        do
        {
        printf("\nEnter the string :");
        scanf("%s",str);
        for(i=0;str[i]!='\0';i++)
        {
                switch(f)
                {
                        case '1':
                                if (str[i]=='a')
                                {
                                        f='2';
                                }
                                else if(str[i]=='b')
                                {
                                        f='1';
                                }
```

```
            break;
case '2':
            if (str[i]=='a')
            {
                        f='2';
            }
            else if(str[i]=='b')
            {
                        f='3';
            }
            break;
case '3':
            if(str[i]=='a')
            {
                        f='2';
            }
            else if(str[i]=='b')
            {
                        f='4';
            }
            break;
case '4':
            if(str[i]=='a')
            {
                        f='2';
            }
            else if(str[i]=='b')
            {
                        f='1';}
```

```
                                    break;
                        }
            }
            if(f=='4')
            {
                        printf("string is accepted",f );
            }
            else
            {
                        printf("string is not accepted",f);
            }
            printf("\nDo you want to continue ? ");
            scanf("%s",&c);
}while(c=='y'||c=='Y');
return 0;}
```

OUTPUT:



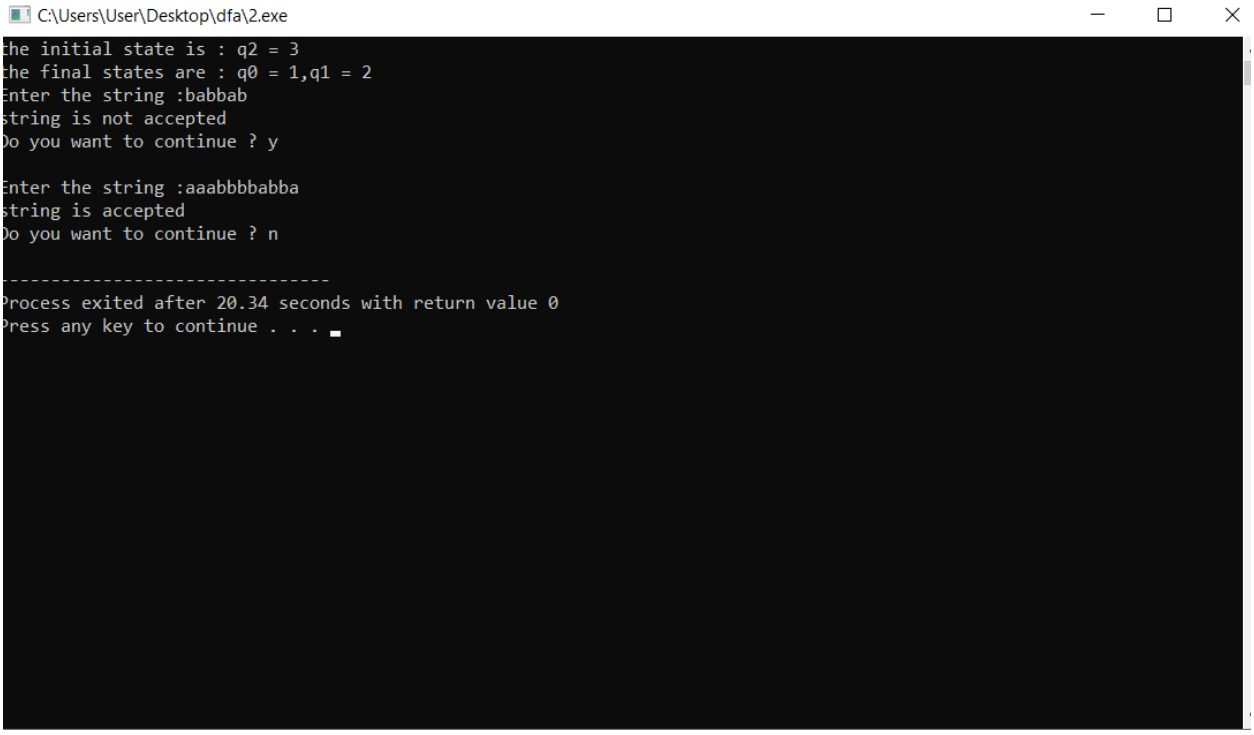
```
//2. Construct DFA over {a,b} accepting strings that do not end with ab.
#include<stdio.h>
#include<stdlib.h>
#define max 100
int main()
{
	char str[max];
	char c;
	int i;
	int f ='1';
	printf("the initial state is : q2 = 3 ");
	printf("\nthe final states are : q0 = 1,q1 = 2 ");
	do
	{
	printf("\nEnter the string :");
	scanf("%s",str);
	for(i=0;str[i]!='\0';i++)
	{
		switch(f)
		{
			case '1':
				if (str[i]=='a')
				{
					f='2';
				}
				else if(str[i]=='b')
				{
					f='1';
				}
```

```
                    break;
                case '2':
                    if (str[i]=='a')
                    {
                        f='2';
                    }
                    else if(str[i]=='b')
                    {
                        f='3';
                    }
                    break;
                case '3':
                    if(str[i]=='a')
                    {
                        f='2';
                    }
                    else if(str[i]=='b')
                    {
                        f='1';
                    }
                    break;
            }
    }
    if(f=='1'|| f=='2')
    {
        printf("string is accepted",f );

    }
    else
```

```
        {
                printf("string is not accepted",f);
        }
        printf("\nDo you want to continue ? ");
        scanf("%s",&c);
}
        while(c=='y'||c=='Y');
        return 0;
}
```

OUTPUT:



//3. Construct DFA over {a,b} that contains 'aba' as substring.

```
#include <stdio.h>
#include <string.h>
#define max 100
void checkValidDFA(char s[max] )
{
	int i;
	int initial_state = 0;
	int previous_state = initial_state;
	int final_state;
	for( i = 0; i < strlen(s); i++)
	{
	if((previous_state == 0 && s[i] == 'a') ||
	(previous_state == 1 && s[i] == 'a'))
	{
		final_state = 1;
	}
	if((previous_state == 0 && s[i] == 'b') ||
	(previous_state == 2 && s[i] == 'b'))
	{
		final_state = 0;
	}
	if(previous_state == 1 && s[i] == 'b')
	{
		final_state = 2;
	}
	if((previous_state == 2 && s[i] == 'a') ||
```

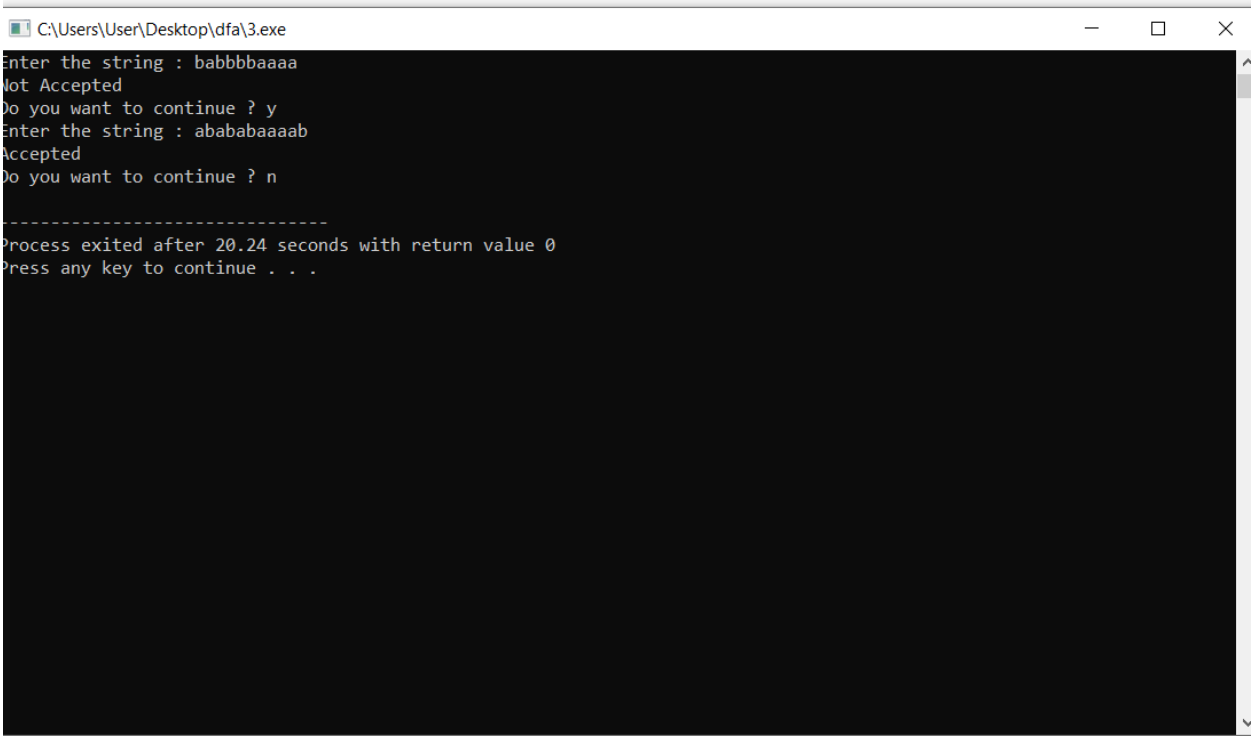
```
        (previous_state == 3))
        {
                final_state = 3;
        }
                previous_state = final_state;
        }

        if(final_state == 3)
        {
                printf("Accepted");
        }
        else
        {
                printf("Not Accepted");
        }
}

int main()
{
   char c;
   char s[max];
   do
   {
        printf("Enter the string : ");
        scanf("%s",s);
        checkValidDFA(s);
        printf("\nDo you want to continue ? ");
        scanf("%s",&c);
   }
```

```
    while(c=='y');
    return 0;
}
```

OUTPUT:



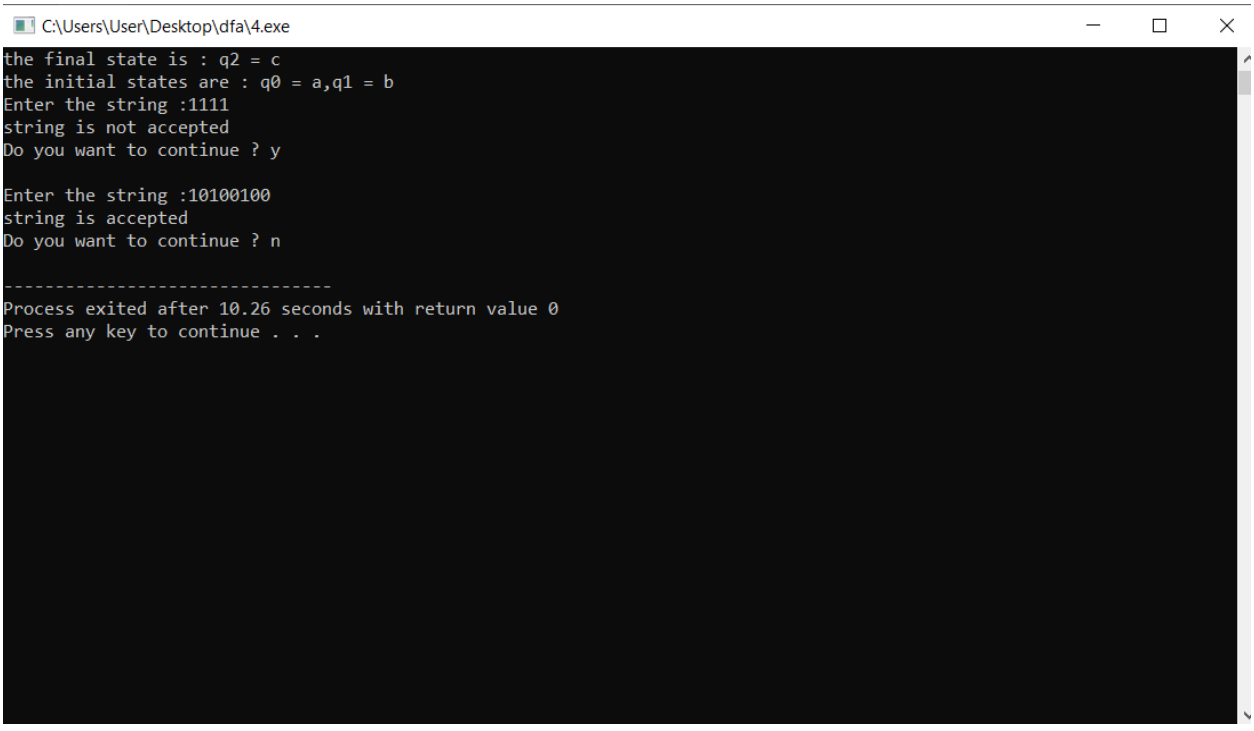
//4. Construct a DFA over {0,1} that accepts a set of all strings ending with '00'.

```
#include<stdio.h>
#include<stdlib.h>
#define max 100
int main()
{
char str[max];
char c;
int i;
char f ='a';
printf("the final state is : q2 = c ");
printf("\nthe initial states are : q0 = a,q1 = b ");
do
{
printf("\nEnter the string :");
scanf("%s",str);
for(i=0;str[i]!='\0';i++)
{
switch(f)
{
case 'a':
if (str[i]=='0')
{
f='b';
}
else if(str[i]=='1')
{
```

```
f='a';
}
break;
case 'b':
if (str[i]=='0')
{
f='c';
}
else if(str[i]=='1')
{
f='a';
}
break;
case 'c':
if(str[i]=='0')
{
f='c';
}
else if(str[i]=='1')
{
f='a';
}
break;
}
}
if(f=='c')
{
printf("string is accepted",f);
```

```
}
else
{
printf("string is not accepted",f);
}
printf("\nDo you want to continue ? ");
scanf("%s",&c);
}
while(c=='y'||c=='Y');
return 0;
}
```

OUTPUT:



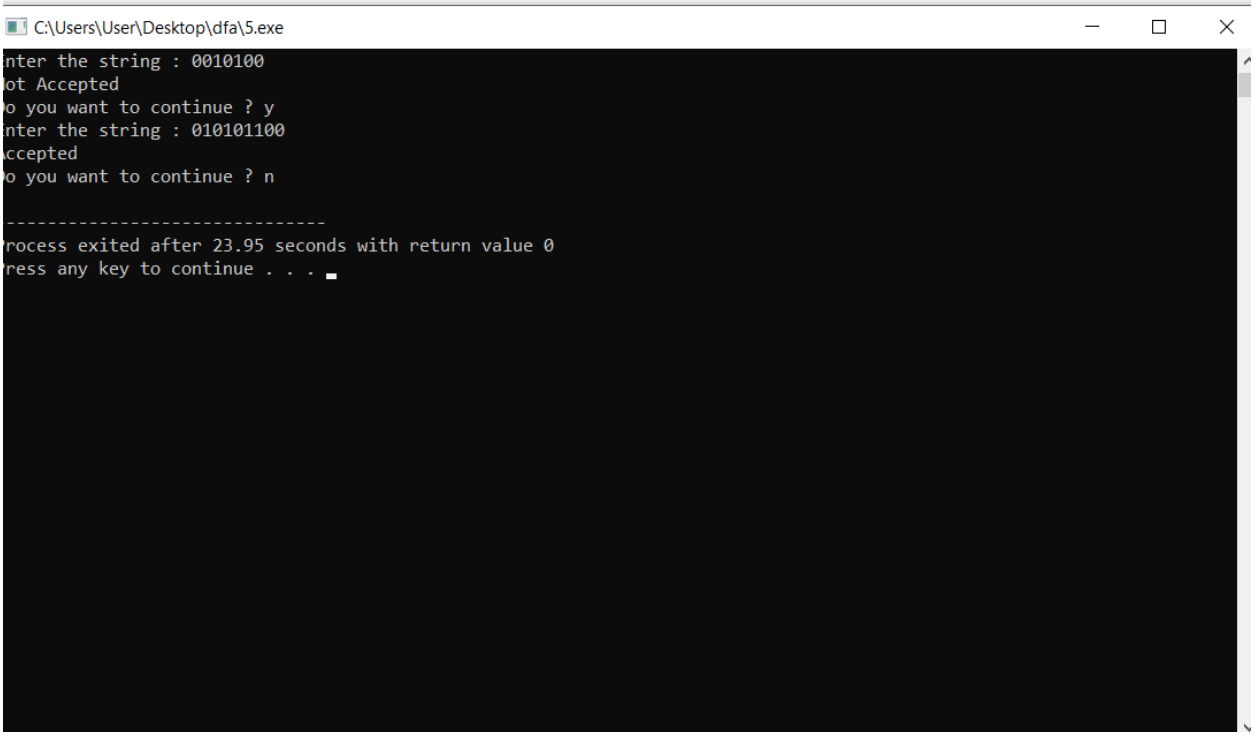
//5. Construct a DFA over {0,1} that accepts a set of strings with '011' as a substring.

```
#include <stdio.h>
#include <string.h>
#define max 100
void checkValidDFA(char s[max] )
{
int i;
int initial_state = 0;
int previous_state = initial_state;
int final_state;
for( i = 0; i < strlen(s); i++)
{
if((previous_state == 0 && s[i] == '0') ||(previous_state == 1 && s[i] == '0')||(previous_state == 2 && s[i]=='0'))
{
   final_state = 1;
}
if(previous_state == 0 && s[i] == '1')
{
   final_state = 0;
}
if(previous_state == 1 && s[i] == '1')
{
   final_state = 2;
}
if((previous_state == 2 && s[i] == '1') || (previous_state == 3))
{
   final_state = 3;
```

```
}
    previous_state = final_state;
}

if(final_state == 3)
{
   printf("Accepted");
}
else
{
   printf("Not Accepted");
}
}
int main()
{
   char c;
   char s[max];
   do
   {
        printf("Enter the string : ");
        scanf("%s",s);
         checkValidDFA(s);
      printf("\nDo you want to continue ? ");
      scanf("%s",&c);
   }
   while(c=='y');
   return 0;
}
```

OUTPUT:


C:\Users\User\Desktop\dfa\5.exe
nter the string : 0010100
ot Accepted
o you want to continue ? y
nter the string : 010101100
ccepted
o you want to continue ? n
rocess exited after 23.95 seconds with return value 0
ress any key to continue . . .

```
//6. Construct a DFA over {0,1} accepting only {10,1,110}.
#include <stdio.h>
#include <string.h>
#define max 100
void checkValidDFA(char s[max] )
{
int i;
int initial_state = 0;
int previous_state = initial_state;
int final_state;

for( i = 0; i < strlen(s); i++)
{
if(previous_state == 0 && s[i] == '0')
{
final_state = 4;
}
if(previous_state == 0 && s[i] == '1')
{
final_state = 1;
}
if(previous_state == 1 && s[i] == '0')
{
final_state = 2;
}
if(previous_state == 1 && s[i] == '1')
{
final_state = 3;
}
```

```
if((previous_state == 2 && s[i] == '0') || (previous_state == 2 && s[i] == '1' ))
{
final_state = 4;
}
if(previous_state == 3 && s[i] == '1')
{
final_state = 4;
}
if(previous_state == 3 && s[i] == '0')
{
final_state = 2;
}
if((previous_state == 4 && s[i] == '0') || (previous_state == 4 && s[i] == '1' ))
{
final_state = 4;
}

previous_state = final_state;
}

if((final_state == 1) || (final_state == 2))
{
printf("Accepted");
}
else
{
printf("Not Accepted");
}
}
```

```
int main()
{
   char c;
   char s[max];
   do
   {
printf("Enter the string : ");
scanf("%s",s);
checkValidDFA(s);
printf("\nDo you want to continue ? ");
scanf("%s",&c);
   }
   while(c=='y');
   return 0;
}
```

OUTPUT: