EXPERIMENT 2:-

PROGRAM:-

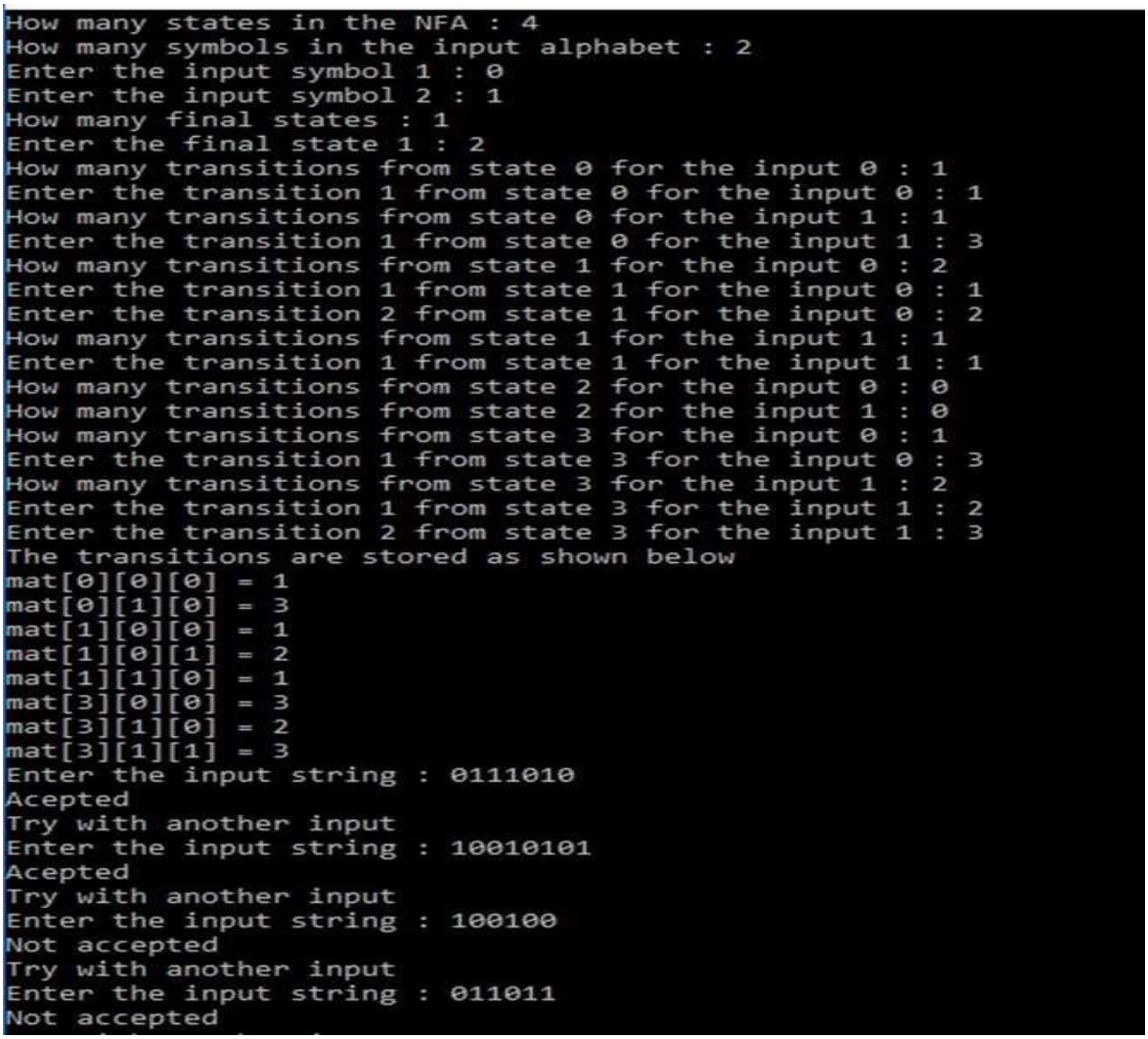
```
include<stdio.h>
#include<string.>
int main()
{
 int
i,j,k,l,m,next_state[20],n,mat[10][10][10],flag,p;   int
num_states,final_state[5],num_symbols,num_final;
int present_state[20],prev_trans,new_trans;
        char
ch,input[20];   int
symbol[5],inp,inp1;
        printf("How many states in the NFA : ");
 scanf("%d",&num_states);
        printf("How many symbols in the input alphabet : ");
        scanf("%d",&num_symbols);
        for(i=0;i<num_symbols;i++)
        {
                printf("Enter the input symbol %d : ",i+1);
                scanf("%d",&symbol[i]);
        }
        printf("How many final states : ");
 scanf("%d",&num_final);
        for(i=0;i<num_final;i++)
        {
                printf("Enter the final state %d : ",i+1);
scanf("%d",&final_state[i]);
        }
        //Initialize all entries with -1 in Transition table
        for(i=0;i<10;i++)
        {
                for(j=0;j<10;j++)
                {
                        for(k=0;k<10;k++)
                        {
                                mat[i][j][k]=-1;
                        }
                }
        }
        //Get input from the user and fill the 3D transition table
        for(i=0;i<num_states;i++)
        {
```

```
                for(j=0;j<num_symbols;j++)
                {
                        printf("How many transitions from state %d for the input %d :
",i,symbol[j]);
                        scanf("%d",&n);
for(k=0;k<n;k++)
                        {
                                printf("Enter the transition %d from state %d for the input
%d : ",k+1,i,symbol[j]);
                                scanf("%d",&mat[i][j][k]);
                        }
                }
        }
        printf("The transitions are stored as shown below\n");
for(i=0;i<10;i++)
        {
                for(j=0;j<10;j++)
                {
                        for(k=0;k<10;k++)
                        {
                           if(mat[i][j][k]!=-1)
            printf("mat[%d][%d][%d] = %d\n",i,j,k,mat[i][j][k]);
                        }
                }
        }
        while(1)
        {
                printf("Enter the input
string : ");             scanf("%s",input);
       present_state[0]=0;
 prev_trans=1;
 l=strlen(input);
                for(i=0;i<l;i++)
                {
                   if(input[i]=='0')
          inp1=0;
else if(input[i]=='1')

inp1=1;
else
       {
          printf("Invalid input\n");
exit(0);
       }
       for(m=0;m<num_symbols;m++)
```

```
                        {
                                if(inp1==symbol[m])
                                {
                        inp=m;
                        break;
                                }
                        }
                        new_trans=0;
                        for(j=0;j<prev_trans;j++)
                        {
                                k=0;
                                p=present_state[j];
                                while(mat[p][inp][k]!=-1)
                                {
                                        next_state[new_trans++]=mat[p][inp][k];
                                        k++;
                                }
                        }
                        for(j=0;j<new_trans;j++)
                        {
                                present_state[j]=next_state[j];
                        }
                        prev_trans=new_trans;
                }
                flag=0;
                for(i=0;i<prev_trans;i++)
                {
                        for(j=0;j<num_final;j++)
                        {
                                if(present_state[i]==final_state[j])
                                {
                                        flag=1;
                                break;
                                }
                        }
                }
                if(flag==1)
printf("Acepted\n");
                else
                        printf("Not accepted\n");
                printf("Try with another input\n");
        }
}
```

OUTPUT:-


How many states in the NFA : 4
How many symbols in the input alphabet : 2
Enter the input symbol 1 : 0
Enter the input symbol 2 : 1
How many final states : 1
Enter the final state 1 : 2
How many transitions from state 0 for the input 0 : 1
Enter the transition 1 from state 0 for the input 0 : 1
How many transitions from state 0 for the input 1 : 1
Enter the transition 1 from state 0 for the input 1 : 3
How many transitions from state 1 for the input 0 : 2
Enter the transition 1 from state 1 for the input 0 : 1
Enter the transition 2 from state 1 for the input 0 : 2
How many transitions from state 1 for the input 1 : 1
Enter the transition 1 from state 1 for the input 1 : 1
How many transitions from state 2 for the input 0 : 0
How many transitions from state 2 for the input 1 : 0
How many transitions from state 3 for the input 0 : 1
Enter the transition 1 from state 3 for the input 0 : 3
How many transitions from state 3 for the input 1 : 2
Enter the transition 1 from state 3 for the input 1 : 2
Enter the transition 2 from state 3 for the input 1 : 3
The transitions are stored as shown below
mat[0][0][0] = 1
mat[0][1][0] = 3
mat[1][0][0] = 1
mat[1][0][1] = 2
mat[1][1][0] = 1
mat[3][0][0] = 3
mat[3][1][0] = 2
mat[3][1][1] = 3
Enter the input string : 0111010
Acepted
Try with another input
Enter the input string : 10010101
Acepted
Try with another input
Enter the input string : 100100
Not accepted
Try with another input
Enter the input string : 011011
Not accepted