Practical No. 05

Name: Sushrut Rajesh Babhulkar

PRN: 1841003

Batch: B1

Class: L.Y. B.Tech. (Computer Engineering)

Subject: CO406UC Compiler Design Lab

Aim: Simulate First and Follow of a Grammar.

Program :

```c
#include <stdio.h>
#include<string.h>

int numOfProd;
char prods[10][10],f[10];
int m=0;
void first(char a);
void follow(char a);

int main()
{
        printf("\nEnter the number of Productions :- ");
        scanf("%d",&numOfProd);
        printf("\nEnter the Productions :- ");
        for(int i=0;i<numOfProd;i++)
                scanf("%s",prods[i]);
```

```c
int choice;
char choi;
do
{
    m = 0;
    printf("\nEnter the element to find First and Follow :- ");

    getchar();
    scanf("%c",&choi);

    first(choi);
    printf("First(%c)={",choi);
    for(int i=0;i<m;i++)
        printf("%c",f[i]);
    printf("}\n");
    strcpy(f," ");

    m = 0;
    follow(choi);
    printf("Follow(%c)={",choi);
    for(int i=0;i<m;i++)
        printf("%c",f[i]);
    printf("}\n");
    printf("Do you want to continue?(1/0)");
    scanf("%d",&choice);
```

```c
        }
        while(choice==1);
        return 0;
}


void first(char a)
{

        if((a>='a'&&a<='z')||a=='$')
        {
                f[m++] = a;
        }

        for(int k=0;k<numOfProd;k++)
        {
                if(prods[k][0]==a)
                {
                        if(prods[k][2]=='$')
                                follow(prods[k][0]);
                        else
if((prods[k][2]>='a'&&prods[k][2]<='z')||prods[k][2]=='$')
                                f[m++] = prods[k][2];
                        else
                                first(prods[k][2]);
                }
        }
}
```

```c
void follow(char a)
{
    if (prods[0][0] == a)
    f[m++] = '$';
    for (int i = 0; i < numOfProd; i++)
    {
    for (int j = 2; j < strlen(prods[i]); j++)
    {
        if (prods[i][j] == a)
        {
        if (prods[i][j + 1] != '\0')
            first(prods[i][j + 1]);
        if (prods[i][j + 1] == '\0' && a != prods[i][0])
            follow(prods[i][0]);
        }
    }
    }
}
```

Output:

```
compilation terminated.
PS C:\Users\chaud\Desktop\Practicals\CDL> gcc '.\P5(1).c'
PS C:\Users\chaud\Desktop\Practicals\CDL> .\a.exe

Enter the number of Productions :- 3

Enter the Productions :- S=CC
C=eC
C=d

Enter the element to find First and Follow :- S
First(S)={ed}
Follow(S)={$}
Do you want to continue?(1/0)1

Enter the element to find First and Follow :- C
First(C)={ed}
Follow(C)={ed$}
Do you want to continue?(1/0)1

Enter the element to find First and Follow :- d
First(d)={d}
Follow(d)={ed$}
Do you want to continue?(1/0)
```