OBJECTIVE-7

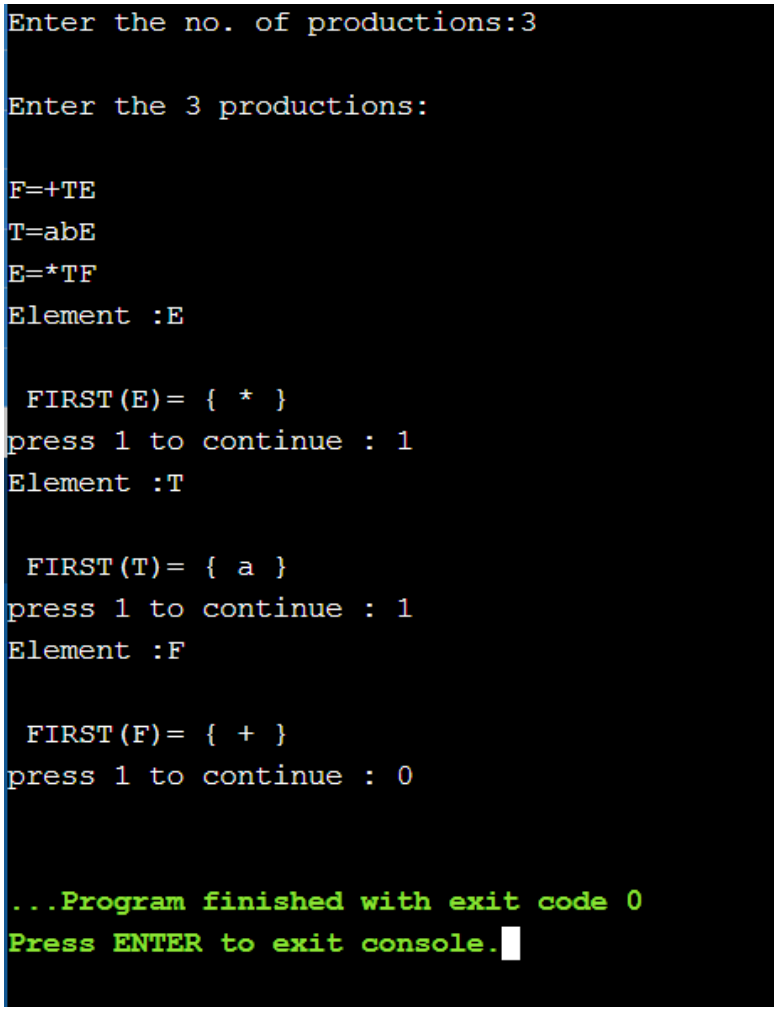
AIM:-Write a C program to:-

a.)compute First sets for a given grammar.

```
#include<stdio.h>
#include<ctype.h>
void FIRST(char );
int count,n=0;
char prodn[10][10], first[10];
int main()
{
int i,choice;
char c,ch;
printf("Enter the no. of productions:");
scanf("%d",&count);
printf("\nEnter the %d productions:\n\n",count);
for(i=0;i<count;i++)
scanf("%s%c",prodn[i],&ch);
do
{
n=0;
printf("Element :");
scanf("%c",&c);
FIRST(c);
```

```
printf("\n FIRST(%c)= { ",c);
for(i=0;i<n;i++)
printf("%c ",first[i]);
printf("}\n");
printf("press 1 to continue : ");
scanf("%d%c",&choice,&ch);
}
while(choice==1);
}
void FIRST(char c)
{
int j;
if(!(isupper(c)))first[n++]=c;
for(j=0;j<count;j++)
{
if(prodn[j][0]==c)
{
if(prodn[j][2]=='$') first[n++]='$';
else if(islower(prodn[j][2]))first[n++]=prodn[j][2];
else FIRST(prodn[j][2]);
}
}
}
```

OUTPUT-


Enter the no. of productions:3
Enter the 3 productions:
F=+TE
T=abE
E=*TF
Element :E
FIRST(E)= { * }
press 1 to continue : 1
Element :T
FIRST(T)= { a }
press 1 to continue : 1
Element :F
FIRST(F)= { + }
press 1 to continue : 0
...Program finished with exit code 0
Press ENTER to exit console.

b.)compute Follow sets for a given grammar.

```
#include<stdio.h>

#include<string.h>

#include<ctype.h>

int n,m=0,p,i=0,j=0;

char a[10][10],followResult[10];

void follow(char c);

void first(char c);

void addToResult(char);

int main()

{

 int i;

 int choice;

 char c,ch;

 printf("Enter the no.of productions: ");

scanf("%d", &n);

 printf(" Enter %d productions\nProduction with multiple terms should be give as separate productions \n", n);

 for(i=0;i<n;i++)

  scanf("%s%c",a[i],&ch);

    // gets(a[i]);

 do

 {

  m=0;
```

```
  printf("Find FOLLOW of -->");
  scanf(" %c",&c);
  follow(c);
  printf("FOLLOW(%c) = { ",c);
  for(i=0;i<m;i++)
   printf("%c ",followResult[i]);
  printf(" }\n");
  printf("Do you want to continue(Press 1 to continue....)?");
 scanf("%d%c",&choice,&ch);
 }
 while(choice==1);
}
void follow(char c)
{
    if(a[0][0]==c)addToResult('$');
 for(i=0;i<n;i++)
 {
  for(j=2;j<strlen(a[i]);j++)
  {
   if(a[i][j]==c)
   {
    if(a[i][j+1]!='\0')first(a[i][j+1]);
    if(a[i][j+1]=='\0'&&c!=a[i][0])
```

```
    follow(a[i][0]);
   }
  }
 }
}
void first(char c)
{
     int k;
            if(!(isupper(c)))
               addToResult(c);
            for(k=0;k<n;k++)
            {
            if(a[k][0]==c)
            {
            if(a[k][2]=='$') follow(a[i][0]);
            else if(islower(a[k][2]))
               addToResult(a[k][2]);
            else first(a[k][2]);
            }
            }
}
void  addToResult(char c)
{
```

```
    int i;
    for( i=0;i<=m;i++)
        if(followResult[i]==c)
            return;
   followResult[m++]=c;
}
```

OUTPUT-

```
Enter the no.of productions: 8
 Enter 8 productions
Production with multiple terms should be give as separate productions
E=TD
D=+TD
D=$
T=FS
S=*FS
S=$
F={E}
F=a
Find FOLLOW of -->F
FOLLOW(F) = { * + $ }  }
Do you want to continue(Press 1 to continue....)?1
Find FOLLOW of -->S
FOLLOW(S) = { + $ }  }
Do you want to continue(Press 1 to continue....)?1
Find FOLLOW of -->T
FOLLOW(T) = { $ }  }
Do you want to continue(Press 1 to continue....)?1
Find FOLLOW of -->D
FOLLOW(D) = { }  }
Do you want to continue(Press 1 to continue....)?1
Find FOLLOW of -->E
FOLLOW(E) = { $  }
Do you want to continue(Press 1 to continue....)?0


...Program finished with exit code 0
Press ENTER to exit console.
```