

EXP-5 (COMPUTATION OF FIRST AND FOLLOW)

DATE:17/02/2022

COMPUTATION OF FIRST:

Aim: To Compute the First For the Given Productions

Algorithm:

Algorithm for FIRST:-

$S \rightarrow aBDH$
 $B \rightarrow cC$
 $C \rightarrow bC$
 $D \rightarrow EF$
 $E \rightarrow g$
 $F \rightarrow g$

$FIRST(S) = a$
 $FIRST(B) = c$
 $FIRST(C) = b$
 $FIRST(D) = \text{FIRST}(E) = g$
 $FIRST(E) = g$
 $FIRST(F) = g$

$FIRST(\alpha)$ is a set of terminals that begin in strings derived from α .

CODE:

```

#include<stdio.h>
#include<string.h>
#include<ctype.h>
char gram[10][10],first[10];
int k=0,n;
void funcfirst(char g,int n)
{
    int i,j;
    if(!(isupper(g)))
        first[k++]=g;
    else

```

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```
{
    for(i=0;i<n;i++)
    {
        if(gram[i][0]==g)
        {
            if(islower(gram[i][3]))
                first[k++]=gram[i][3];
            else
                funcfirst(gram[i][3],n);
        }
    }
}

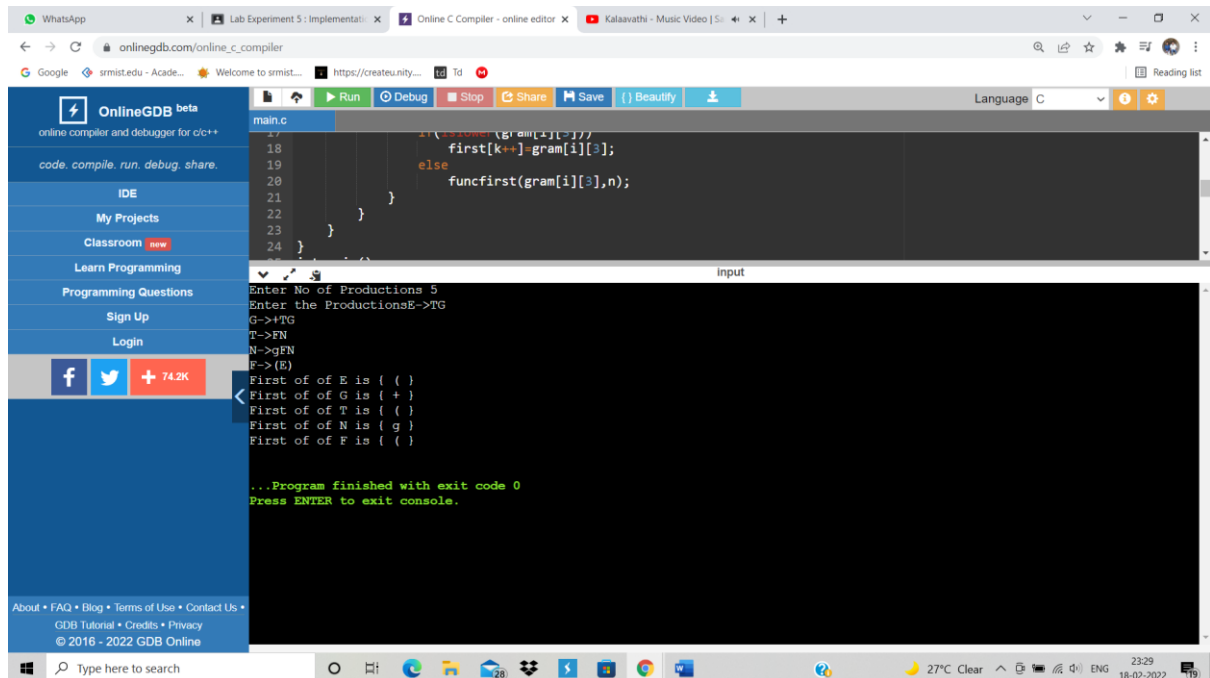
int main()
{
    char nt;
    printf("Enter No of Productions ");
    scanf("%d",&n);
    printf("Enter the Productions");
    for(int i=0;i<n;i++)
    {
        scanf("%s",gram[i]);
    }
    for(int i=0;i<n;i++)
    {
        k=0;
        funcfirst(gram[i][0],n);
        printf("First of of %c is { ",gram[i][0]);
        for(int i=0;i<k;i++)
        {
            printf(" %c ",first[i]);
        }
        printf("}");
        printf("\n");
    }
}
```

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```
}  
  
return 0;  
  
}
```

OUTPUT:



The screenshot shows the OnlineGDB web IDE interface. The code editor displays a C program with the following code:

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```

The output console shows the following text:

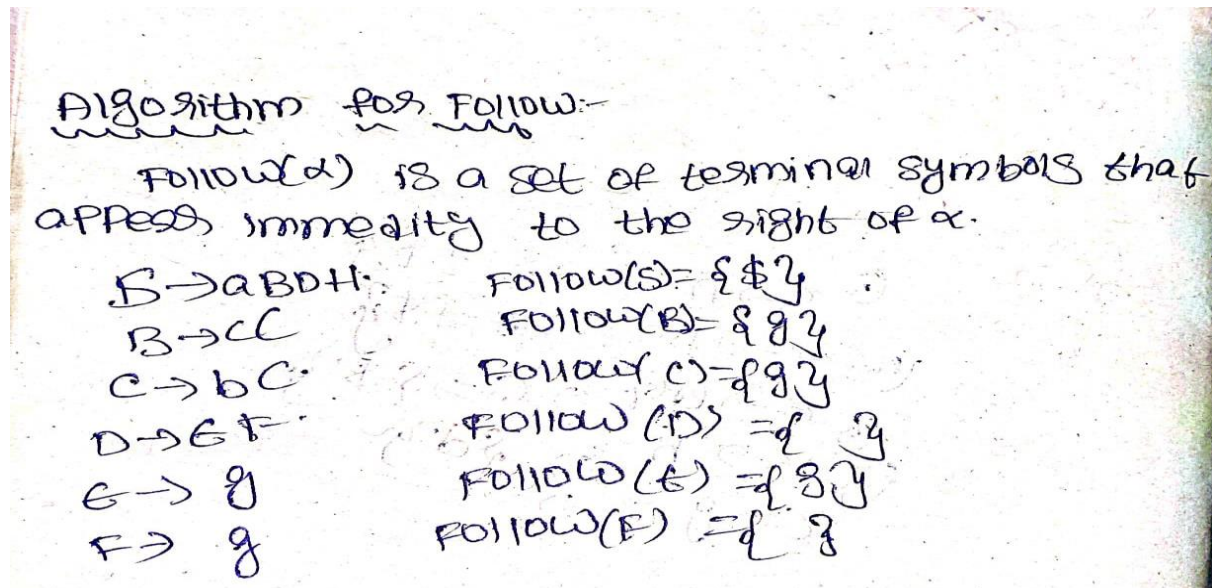
```
Enter No of Productions 5  
Enter the ProductionsE->TG  
G->+TG  
T->FN  
N->qFN  
F->(E)  
First of of E is { ( )  
First of of G is { + }  
First of of T is { ( )  
First of of N is { g }  
First of of F is { ( )  
...Program finished with exit code 0  
Press ENTER to exit console.
```

RESULT: Hence First is Implemented.

COMPUTATION OF FOLLOW:

Aim: To Compute The Follow for given Grammer.

Algorithm:



CODE:

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

char gram[10][10],res[10];
int k=0;

void first(char g,int n)
{
    if(!(isupper(g)))
        res[k++]=g;
    else
    {
        for(int i=0;i<n;i++)
        {
            if(gram[i][0]==g)
            {
                if(islower(gram[i][3]))
                    res[k++]=gram[i][3];
                else
                    first(gram[i][3],n);
            }
        }
    }
}
```

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```
    }
}

void follow(char c,int n)
{
    if(gram[0][0]==c)
        res[k++]='$';
    for(int i=0;i<n;i++)
    {
        for(int j=3;j<strlen(gram[i]);j++)
        {
            if(gram[i][j]==c)
            {
                if(gram[i][j+1]!='\0')
                    first(gram[i][j+1],n);
                if(gram[i][j+1]=='\0' && c!=gram[i][0])
                    follow(gram[i][0],n);
            }
        }
    }
}

int main()
{
    char nt;
    int n;
    printf("Enter No of Productions ");
    scanf("%d",&n);
    printf("Enter the Productions");
    for(int i=0;i<n;i++)
    {
        scanf("%s",gram[i]);
    }
    for(int i=0;i<n;i++)
    {
        k=0;
```

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```
follow(gram[i][0],n);

printf("Follow of of %c is {",gram[i][0]);

for(int i=0;i<k;i++)

{

    printf(" %c ",res[i]);

}

printf("{}");

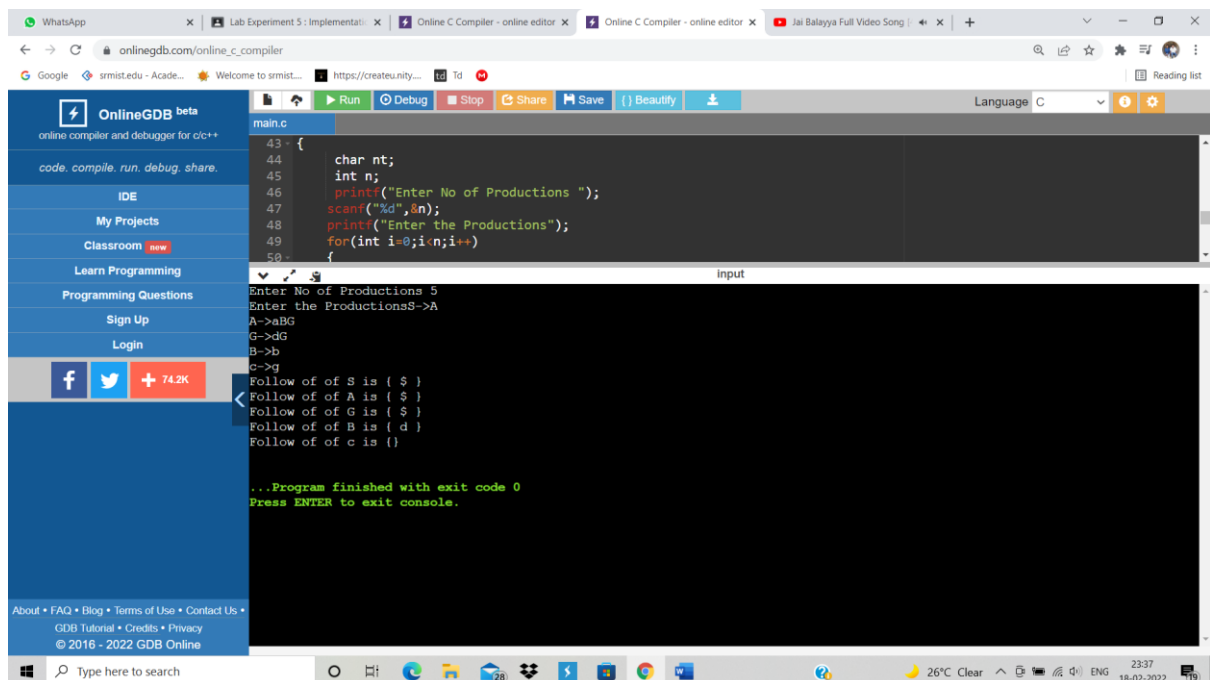
printf("\n");

}

return 0;

}
```

OUTPUT:



The screenshot shows the OnlineGDB online compiler interface. The code in the editor is as follows:

```
43 - {
44     char nt;
45     int n;
46     printf("Enter No of Productions ");
47     scanf("%d",&n);
48     printf("Enter the Productions");
49     for(int i=0;i<n;i++)
50     {
```

The input provided is:

```
Enter No of Productions 5
Enter the Productions->A
A->ABG
G->dG
B->b
C->q
```

The output of the program is:

```
Follow of of S is { }
Follow of of A is { }
Follow of of G is { }
Follow of of B is { d }
Follow of of c is { }
```

The program finished with exit code 0. The user is prompted to press ENTER to exit the console.

RESULT: HENCE FOLLOW IMPLEMENTED.