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Friday, 24 May 2013

## C code to Find First and Follow in a given Grammar

C program to find First and Follow in a given Grammar.

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

int i,j,l,m,n=0,o,p,nv,z=0,x=0;
char str[10],temp,temp2[10],temp3[20],*ptr;

struct prod
{
    char lhs[10],rhs[10][10],ft[10],fol[10];
    int n;
}pro[10];

void findter()
{
    int k,t;
    for(k=0;k<n;k++)
    {
        if(temp==pro[k].lhs[0])
        {
            for(t=0;t<pro[k].n;t++)
            {
                if( pro[k].rhs[t][0]<65 || pro[k].rhs[t][0]>90 )
                    pro[i].ft[strlen(pro[i].ft)=pro[k].rhs[t][0];
                else if( pro[k].rhs[t][0]>=65 && pro[k].rhs[t][0]<=90
                {
                    temp=pro[k].rhs[t][0];
                    if(temp=='S')
                        pro[i].ft[strlen(pro[i].ft)]= '#';
                    findter();
                }
            }
            break;
        }
    }
}

void findfol()
{
    int k,t,p1,o1,chk;
    char *ptr1;
    for(k=0;k<n;k++)
    {
        chk=0;
        for(t=0;t<pro[k].n;t++)
        {
            ptr1=strchr(pro[k].rhs[t],temp);
            if( ptr1 )
            {
                p1=ptr1-pro[k].rhs[t];
                if(pro[k].rhs[t][p1+1]>=65 && pro[k].rhs[t][p1+1]<=90)
                {
                    for(o1=0;o1<n;o1++)
                    {
                        if(pro[o1].lhs[0]==pro[k].rhs[t][p1+1])
                        {
                            strcat(pro[i].fol,pro[o1].ft);
                            chk++;
                        }
                    }
                }
                else if(pro[k].rhs[t][p1+1]=='\0')
                {
                    temp=pro[k].lhs[0];
                    if(pro[l].rhs[j][p]==temp)
                        continue;
                }
            }
        }
    }
}
```

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**Md Mohsin**

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```

        if(temp=='S')
            strcat(pro[i].fol, "$");
            findfol();
            chk++;
        }
        else
        {
            pro[i].fol[strlen(pro[i].fol)]=pro[k].rhs[t][p1+1];
            chk++;
        }
    }
    if(chk>0)
        break;
}
}

int main()
{
    FILE *f;
    //clrscr();

    for(i=0;i<10;i++)
        pro[i].n=0;

    f=fopen("tab5.txt", "r");
    while(!feof(f))
    {
        fscanf(f, "%s", pro[n].lhs);
        if(n>0)
        {
            if( strcmp(pro[n].lhs, pro[n-1].lhs) == 0 )
            {
                pro[n].lhs[0]='\0';
                fscanf(f, "%s", pro[n-1].rhs[pro[n-1].n]);
                pro[n-1].n++;
                continue;
            }
        }
        fscanf(f, "%s", pro[n].rhs[pro[n].n]);
        pro[n].n++;
        n++;
    }

    printf("\n\nTHE GRAMMAR IS AS FOLLOWS\n\n");
    for(i=0;i<n;i++)
        for(j=0;j<pro[i].n;j++)
            printf("%s -> %s\n", pro[i].lhs, pro[i].rhs[j]);

    pro[0].ft[0]='#';
    for(i=0;i<n;i++)
    {
        for(j=0;j<pro[i].n;j++)
        {
            if( pro[i].rhs[j][0]<65 || pro[i].rhs[j][0]>90 )
            {
                pro[i].ft[strlen(pro[i].ft)]=pro[i].rhs[j][0];
            }
            else if( pro[i].rhs[j][0]>=65 && pro[i].rhs[j][0]<=90 )
            {
                temp=pro[i].rhs[j][0];
                if(temp=='S')
                {
                    pro[i].ft[strlen(pro[i].ft)]=temp;
                    findter();
                }
            }
        }
    }

    printf("\n\nFIRST\n");
    for(i=0;i<n;i++)
    {
        printf("\n%s -> ", pro[i].lhs);
        for(j=0;j<strlen(pro[i].ft);j++)
        {
            for(l=j-1;l>=0;l--)
                if(pro[i].ft[l]==pro[i].ft[j])
                    break;
            if(l==-1)
                printf("%c", pro[i].ft[j]);
        }
    }

    for(i=0;i<n;i++)
        temp2[i]=pro[i].lhs[0];
    pro[0].fol[0]='$';
    for(i=0;i<n;i++)
    {
        for(l=0;l<n;l++)
        {
            for(j=0;j<pro[i].n;j++)
            {
                ptr=strchr(pro[l].rhs[j], temp2[i]);
                if( ptr )
                {
                    p=ptr-pro[l].rhs[j];
                    if(pro[l].rhs[j][p+1]>=65 && pro[l].rhs[j][p+1]<=90
                    {

```

```

        for(o=0;o<n;o++)
            if(pro[o].lhs[0]==pro[l].rhs[j][p+1])
                strcat(pro[i].fol,pro[o].ft);
    }
    else if(pro[l].rhs[j][p+1]!='\0')
    {
        temp=pro[l].lhs[0];
        if(pro[l].rhs[j][p]==temp)
            continue;
        if(temp=='S')
            strcat(pro[i].fol,"$");
        findfol();
    }
    else
        pro[i].fol[strlen(pro[i].fol)]=pro[l].rhs[j][p];
    }
}
}

printf("\n\nFOLLOW\n");
for(i=0;i<n;i++)
{
    printf("\n%s -> ",pro[i].lhs);
    for(j=0;j<strlen(pro[i].fol);j++)
    {
        for(l=j-1;l>=0;l--)
            if(pro[i].fol[l]==pro[i].fol[j])
                break;
        if(l==-1)
            printf("%c",pro[i].fol[j]);
    }
    printf("\n");
    //getch();
}
}

```

Input File(tab5.txt) For First and Follow Program:-

S ABE  
S a  
A p  
A t  
B Aq  
S f  
A w

Output:-

```

znsofttech@znsofttech-OEM:~$ gcc coders_hub.c
znsofttech@znsofttech-OEM:~$ ./a.out

THE GRAMMAR IS AS FOLLOWS

S -> ABE
S -> a
A -> p
A -> t
B -> Aq
S -> f
A -> w
->

FIRST

S -> #pta
A -> pt
B -> pt
S -> f
A -> w
->

FOLLOW

S -> $
A -> ptq
B ->
S ->
A -> ptq
-> $pt
znsofttech@znsofttech-OEM:~$

```

Related Programs:-

- ★ [Regular Grammar](#)
- ★ [SLR Parser](#)
- ★ [Context Free Grammar \(CFG\)](#)
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Posted by [Md Mohsin](#) at 11:15 am  
Labels: [Automata](#), [C](#)

9 comments:

 [archa](#) 10:44 am

what symbol represent epsilon?

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**Kushagra Sahni** 10:03 pm

Did This Peice Of Code Worked For You?



**Kushagra Sahni** 10:04 pm

*This comment has been removed by the author.*

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**Kushagra Sahni** 10:02 pm

Gives a Runtime Error For me..!!

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**Debashish Kumar** 1:38 pm

Tab5.txt file diya program ko

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**Kushagra Sahni** 10:04 pm

Gives a Runtime Error For me..!!

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**Ayithe Abhishek** 4:39 pm

Segmentation fault (core dumped)

[Reply](#)



**Ayithe Abhishek** 4:39 pm

Segmentation fault (core dumped)

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**Arya** 2:11 pm

your input will be given from a text file....

those who are getting segmentation fault...

1. create a text file and rename it as "text5.txt"

or any name but if you change the name of text file also do changes in code.

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