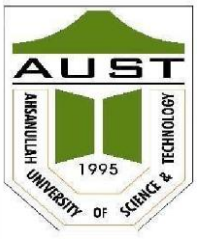
AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
DHAKA-1208, BANGLADESH.



Department of Computer Science and Engineering
Spring 2019

Program: Bachelor of Science in Computer Science and Engineering

Course No: CSE 4130

Course Title: Formal Languages and Compilers Lab

Session: Spring 2019

Assignment No: 06

Date of Submission: 18/10/2019

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Source Code:

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
int main()
{
    char fin[10][20],st[10][20],ft[20][20],fol[20][20];
    int a=0,e,i,t,b,c,n,k,l=0,j,s,m,p;
    ///clrscr();
    printf("enter the no. of coordinates\n");
    scanf("%d",&n);
    printf("enter the productions in a grammar\n");
    for(i=0;i<n;i++)
    scanf("%s",st[i]);
    for(i=0;i<n;i++)
    fol[i][0]='\0';
    for(s=0;s<n;s++)
    {
        for(i=0;i<n;i++)
        {
            j=3;
            l=0;
            a=0;
            l1:if(!((st[i][j]>64)&&(st[i][j]<91)))
            {
                for(m=0;m<l;m++)
                {
                    if(ft[i][m]==st[i][j])
                        goto s1;
                }
                ft[i][l]=st[i][j];
                l=l+1;
                s1:j=j+1;
            }
            else
            {
                if(s>0)
                {
                    while(st[i][j]!=st[a][0])
                    {
                        a++;
                    }
                    b=0;
                    while(ft[a][b]!='\0')
                    {
                        for(m=0;m<l;m++)
                        {
                            if(ft[i][m]==ft[a][b])
                            goto s2;
                        }
                        ft[i][l]=ft[a][b];
                        l=l+1;
                        s2:b=b+1;
                    }
                }
            }
            while(st[i][j]!='\0')
            {
                if(st[i][j]=='|')
```

```
                {
                    j=j+1;
                    goto l1;
                }
                j=j+1;
            }
            ft[i][l]='\0';
        }
    }
    printf("\n\n");
    for(i=0;i<n;i++){
        printf("FIRST[%c]={ %c",st[i][0],ft[i][0]);
        int g=1;
        while(ft[i][g]!='\0'){
            printf(" ,%c", ft[i][g]);
            g++;
        }
        printf(" }\n");
    }
    fol[0][0]='$';
    for(i=0;i<n;i++)
    {
        k=0;
        j=3;
        if(i==0)
        l=1;
        else
            l=0;
        k1:while((st[i][0]!=st[k][j])&&(k<n))
        {
            if(st[k][j]=='\0')
            {
                k++;
                j=2;
            }
            j++;
        }
        j=j+1;
        if(st[i][0]==st[k][j-1])
        {
            if((st[k][j]!='|')&&(st[k][j]!='\0'))
                    {
                        a=0;
                        if(!((st[k][j]>64)&&(st[k][j]<91)))
                        {
                            for(m=0;m<l;m++)
                            {
                                if(fol[i][m]==st[k][j])
                                goto q3;
                            }
                            fol[i][l]=st[k][j];
                            l++;
                            q3: int iiii=0;
                        }
                        else
                        {
                            while(st[k][j]!=st[a][0])
                            {
                                a++;
                            }
                            p=0;
```

```
                            while(ft[a][p]!='\0')
                            {
                                if(ft[a][p]!='@')
                                {
                                    for(m=0;m<l;m++)
                                    {
                                        if(fol[i][m]==ft[a][p])
                                        goto q2;
                                    }
                                    fol[i][l]=ft[a][p];
                                    l=l+1;
                                }
                                else
                                e=1;
                                q2:p++;
                            }
                            if(e==1)
                            {
                                e=0;
                                goto a1;
                            }
                        }
                    }
                    else
                    {
                        a1:c=0;
                        a=0;
                        while(st[k][0]!=st[a][0])
                        {
                            a++;
                        }
                        while((fol[a][c]!='\0')&&(st[a][0]!=st[i][0]))
                        {
                            for(m=0;m<l;m++)
                            {
                                if(fol[i][m]==fol[a][c])
                                goto q1;
                            }
                            fol[i][l]=fol[a][c];
                            l++;
                            q1:c++;
                        }
                    }
                    goto k1;
                }
                fol[i][l]='\0';
            }
            printf("\n\n");
            for(i=0;i<n;i++){
                printf("FOLLOW[%c]={ %c",st[i][0],fol[i][0]);
                int g=1;
                while(ft[i][g]!='\0'){
                    printf(" ,%c", fol[i][g]);
                    g++;
                }
                printf(" }\n");
            }
            printf("\n");
            s=0;
            printf("PREDICTIVE PARSER TABLE\n");
            for(i=0;i<n;i++)
```

```
            {
                j=3;
                while(st[i][j]!='\0')
                {
                    if((st[i][j-1]=='|')||(j==3))
                    {
                        for(p=0;p<=2;p++)
                        {
                            fin[s][p]=st[i][p];
                        }
                        t=j;
                        for(p=3;((st[i][j]!='|')&&(st[i][j]!='\0'));p++)
                        {
                            fin[s][p]=st[i][j];
                            j++;
                        }
                        fin[s][p]='\0';
                        if(st[i][k]=='@')
                        {
                            b=0;
                            a=0;
                            while(st[a][0]!=st[i][0])
                            {
                                a++;
                            }
                            while(fol[a][b]!='\0')
                            {
                                printf("M[%c,%c] = %s\n",st[i][0],fol[a][b],fin[s]);
                                b++;
                            }
                        }
                        else if(!((st[i][t]>64)&&(st[i][t]<91)))
                        printf("M[%c,%c] = %s\n",st[i][0],st[i][t],fin[s]);
                    else
                    {
                        b=0;
                        a=0;
                        while(st[a][0]!=st[i][3])
                        {
                            a++;
                        }
                        while(ft[a][b]!='\0')
                        {
                            printf("M[%c,%c] = %s\n",st[i][0],ft[a][b],fin[s]);
                            b++;
                        }
                    }
                    s++;
                }
                if(st[i][j]=='|')
                j++;
            }
        }
        getch();
        }
```

Output:


G:\AUST4.1\CompilerLab\Lab6\test1.exe
enter the no. of coordinates
4
enter the productions in a grammar
S->aXd
X->YZ
Y->b|#
Z->cX|#
FIRST[S]={ a }
FIRST[X]={ b ,# }
FIRST[Y]={ b ,# }
FIRST[Z]={ c ,# }
FOLLOW[S]={ $ }
FOLLOW[X]={ d , }
FOLLOW[Y]={ c ,# }
FOLLOW[Z]={ d , }
PREDICTIVE PARSER TABLE
M[S,a] = S->aXd
M[X,b] = X->YZ
M[X,#] = X->YZ
M[Y,b] = Y->b
M[Y,#] = Y->#
M[Z,c] = Z->cX
M[Z,#] = Z->#