**Compiler Design(18CSC304J)**

**Experiment 9**

**Predictive Parsing Table**

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**Aim:** To study and implement Predictive Parsing table.

**Language: Python**

**Procedure:**

1. Start the program.
2. Initialize the required variables.
3. Get the number of coordinates and productions from the user.
4. Perform the following
   1. for (each production A → α in G) {
   2. for (each terminal a in FIRST(α))
   3. add A → α to M[A, a];
   4. if (ε is in FIRST(α))
   5. for (each symbol b in FOLLOW(A))
   6. add A → α to M[A, b];
5. Print the resulting stack.
6. Print if the grammar is accepted or not.
7. Exit the program

**Code Snippet:**

#include<stdio.h>

#include<conio.h>

#include<string.h>

void 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;

    printf("enter the no. of nonterminals\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("first \n");

    for(i=0;i<n;i++)

        printf("FIRSt[%c]=%s\n",st[i][0],ft[i]);

    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];

                    j++;

                    l++;

                    q3:;

                }

                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("follow \n");

    for(i=0;i<n;i++)

        printf("FOLLOW[%c]=%s\n",st[i][0],fol[i]);

    printf("\n");

    s=0;

    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++;

            }

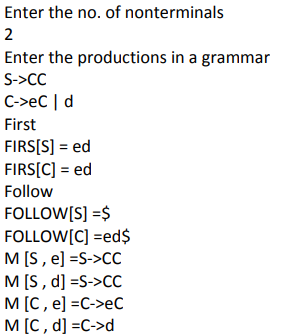
            if(st[i][j]=='|')

            j++;

        }

    }

**Output Screenshots:**



**Result:**

The code was successfully implemented and output was recorded.