PREDICTIVE PARSING TABLE

EX. NO. 6

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AIM: To write a program to implement the predictive parsing table.

ALGORITHM:

1. Start the program.
2. Initialize the required variables.
3. Get the number of coordinates and productions from the user.
4. Perform the following for (each production A → α in G) { for (each terminal a in FIRST(α)) add A → α to M[A, a]; if (ε is in FIRST(α)) for (each symbol b in FOLLOW(A)) 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.

PROGRAM:

```
#include <bits/stdc++.h>
using namespace std;

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;

   cout << ("enter the no. of nonterminals\n");
   scanf("%d",&n);
   cout << ("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';
    }
}
cout << ("first \n");
for(i=0;i<n;i++)
    cout << ("FIRS[%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];
            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++)
```

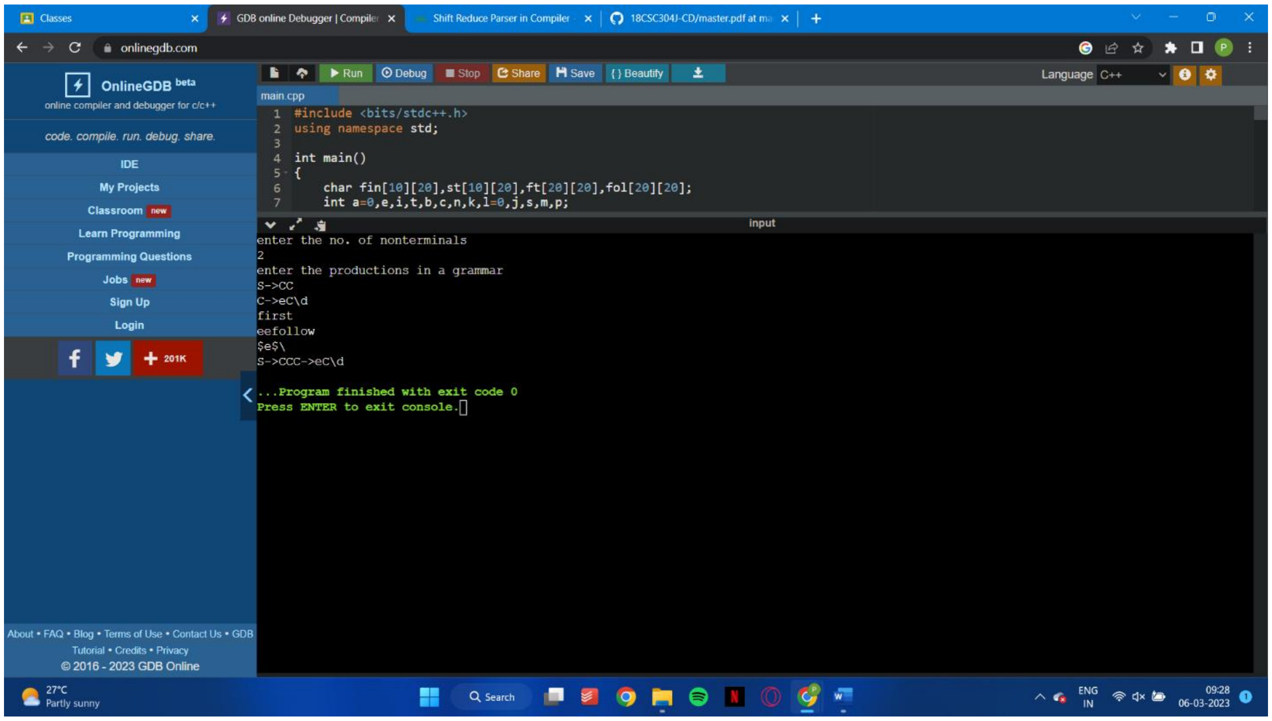
```
                {
                    if(fol[i][m]==fol[a][c])
                    goto q1;
                }
                fol[i][l]=fol[a][c];
                l++;
                q1:c++;
            }
        }
        goto k1;
    }
    fol[i][l]='\0';
}
cout << ("follow \n");
for(i=0;i<n;i++)
    cout << ("FOLLOW[%c]=%s\n",st[i][0],fol[i]);
cout << ("\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')
   {
      cout << ("M[%c,%c]=%s\n",st[i][0],fol[a][b],fin[s]);
      b++;
   }
}
else if(!((st[i][t]>64)&&(st[i][t]<91)))
   cout << ("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')
                    {
                        cout << ("M[%c,%c]=%s\n",st[i][0],ft[a][b],fin[s]);
                        b++;
                    }
                }
                s++;
            }
            if(st[i][j]=='|')
            j++;
        }
    }

}
```

INPUT/OUTPUT :



```cpp
#include <bits/stdc++.h>
using namespace std;

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;
```

```
enter the no. of nonterminals
2
enter the productions in a grammar
S->CC
C->eC\d
first
eefollow
$e$\
S->CCC->eC\d

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

RESULT :

The predictive parsing table has been implemented successfully.