

Practical 4: Write a program in any language to create LL(1) Parser

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I. AIM

A Code that generate First() and Follow() of any Context free Grammars and then create Parsing table to trace any language constructs.

I. Implementation

```
1  /*LL1 PARSING TABLE*/
2  /*To check whether the grammar is LL1 or not*/
3
4  #include <stdio.h>
5  #include <string.h>
6
7  void main() {
8      char
9          → pro[10][10],first[10][10],follow[10][10],nt[10],ter[10],res[10][10][10],temp[10];
10     int npro,noter=0,nont=0,i,j,k,flag=0,count[10][10],row,col,l,m,n,index;
11     for(i=0;i<10;i++) {
12         for(j=0;j<10;j++) {
13             count[i][j] = NULL;
14             for(k=0;k<10;k++) {
15                 res[i][j][k] = NULL;
16             }
17         }
18     }
19     printf("Enter the no of productions:");
20     scanf("%d",&npro);
21     printf("Enter the productions:");
22     for(i=0;i<npro;i++) {
23         scanf("%s",pro[i]);
24     }
25     for(i=0;i<npro;i++) {
26         flag=0;
27         for(j=0;j<nont;j++) {
```

```
27     if(nt[j]==pro[i][0]) {
28         flag=1;
29     }
30 }
31 if(flag==0) {
32     nt[nont]=pro[i][0];
33     nont++;
34 }
35 }
36 printf("\nEnter the first values:\n");
37 for(i=0;i<nont;i++) {
38     printf("First value(%c):",nt[i]);
39     scanf("%s",first[i]);
40 }
41 printf("\nEnter the follow values:\n");
42 for(i=0;i<nont;i++) {
43     printf("Follow value(%c):",nt[i]);
44     scanf("%s",follow[i]);
45 }
46 for(i=0;i<nont;i++) {
47     flag=0;
48     for(j=0;j<strlen(first[i]);j++) {
49         for(k=0;k<noter;k++) {
50             if(ter[k]==first[i][j]) {
51                 flag=1;
52             }
53         }
54         if(flag==0) {
55             if(first[i][j]!='#') {
56                 ter[noter]=first[i][j];
57                 noter++;
58             }
59         }
60     }
61 }
62 for(i=0;i<nont;i++) {
63     flag=0;
64     for(j=0;j<strlen(follow[i]);j++) {
65         for(k=0;k<noter;k++) {
66             if(ter[k]==follow[i][j]) {
67                 flag=1;
68             }
69         }
70     }
71 }
```

```
69         }
70         if(flag==0) {
71             ter[noter]=follow[i][j];
72             noter++;
73         }
74     }
75 }
76 for(i=0;i<nont;i++) {
77     for(j=0;j<strlen(first[i]);j++) {
78         flag=0;
79         if(first[i][j]=='#') {
80             col=i;
81             for(m=0;m<strlen(follow[col]);m++) {
82                 for(l=0;l<noter;l++) {
83                     if(ter[l]==follow[col][m]) {
84                         row=l;
85                     }
86                 }
87                 temp[0]=nt[col];
88                 temp[1]='-';
89                 temp[2]='>';
90                 temp[3]='#';
91                 temp[4]='\0';
92                 printf("temp %s",temp);
93                 strcpy(res[col][row],temp);
94                 count[col][row]+=1;
95                 for(k=0;k<10;k++) {
96                     temp[k]=NULL;
97                 }
98             }
99         }
100     }
101     else {
102         for(l=0;l<noter;l++) {
103             if(ter[l]==first[i][j]) {
104                 row=l;
105             }
106         }
107         for(k=0;k<npro;k++) {
108             if(nt[i]==pro[k][0]) {
109                 col=i;
110                 if((pro[k][3]==first[i][j])&&(pro[k][0]==nt[col])) {
```

```
111         strcpy(res[col][row],pro[k]);
112         count[col][row]++;
113     }
114     else {
115         if((isupper(pro[k][3]))&&(pro[k][0]==nt[col])) {
116             flag=0;
117             for(m=0;m<nont;m++) {
118                 if(nt[m]==pro[k][3]) {
119                     index=m;
120                     flag=1;
121                 }
122             }
123             if(flag==1) {
124                 for(m=0;m<strlen(first[index]);m++) {
125                     if(first[i][j]==first[index][m]) {
126                         strcpy(res[col][row],pro[k]);
127                         count[col][row]++;
128                     }
129                 }
130             }
131         }
132     }
133 }
134 }
135 }
136 }
137 }
138 printf("LL1 Table\n\n");
139 flag=0;
140 for(i=0;i<noter;i++) {
141     printf("\t%c",ter[i]);
142 }
143 for(j=0;j<nont;j++) {
144     printf("\n\n%c",nt[j]);
145     for(k=0;k<noter;k++) {
146         printf("\t%s",res[j][k]);
147         if(count[j][k]>1) {
148             flag=1;
149         }
150     }
151 }
152 if(flag==1) {
```

```

153     printf("\nThe given grammar is not LL1");
154 }
155 else {
156     printf("\nThe given grammar is LL1");
157 }
158 }

```

II. Output

```

Enter the no of productions:2
Enter the productions:ab cd ed

Enter the first values:
First value(a):First value(c):20 30

Enter the follow values:
Follow value(a):Follow value(c):10 20
LL1 Table

      e      d      2      0      3      1

a

c

The given grammar is LL1

```