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1  #include<stdio.h>
2  #include<ctype.h>
3  void FIRST(char[],char );
4  void addToResultSet(char[],char);
5  int numOfProductions;
6  char productionSet[10][10];
7  int main()
8  {
9      int i;
10     char choice;
11     char c;
12     char result[20];
13     printf("How many number of productions ? :");
14     scanf(" %d",&numOfProductions);
15     for(i=0;i<numOfProductions;i++)
16     {
17         printf("Enter productions Number %d : ",i+1);
18         scanf(" %s",productionSet[i]);
19     }
20     do
21     {
22         printf("\n Find the FIRST of :");
23         scanf(" %c",&c);
24         FIRST(result,c);
25         printf("\n FIRST(%c)= { ",c);
26         for(i=0;result[i]!='\0';i++)
27             printf(" %c ",result[i]);
28         printf("}\n");
29         printf("press 'y' to continue : ");
30         scanf(" %c",&choice);
31     }
32     while(choice=='y' || choice == 'Y');
33 }

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34 void FIRST(char* Result,char c)
35 {
36     int i,j,k;
37     char subResult[20];
38     int foundEpsilon;
39     subResult[0]='\0';
40     Result[0]='\0';
41     if(!(isupper(c)))
42     {
43         addToResultSet(Result,c);
44         return ;
45     }
46     for(i=0;i<numOfProductions;i++)
47     {
48         if(productionSet[i][0]==c)
49         {
50             if(productionSet[i][2]=='$') addToResultSet(Result,'$');
51             else
52             {
53                 j=2;
54                 while(productionSet[i][j]!='\0')
55                 {
56                     foundEpsilon=0;
57                     FIRST(subResult,productionSet[i][j]);
58                     for(k=0;subResult[k]!='\0';k++)
59                         addToResultSet(Result,subResult[k]);
60                     for(k=0;subResult[k]!='\0';k++)
61                         if(subResult[k]=='$')
62                         {
63                             foundEpsilon=1;
64                             break;
65                         }
66                     if(!foundEpsilon)
67                         break;

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68         j++;
69     }
70 }
71 }
72 }
73     return ;
74 }
75 void addToResultSet(char Result[],char val)
76 {
77     int k;
78     for(k=0 ;Result[k]!='\0';k++)
79         if(Result[k]==val)
80             return;
81     Result[k]=val;
82     Result[k+1]='\0';
83 }
84
```

How many number of productions ? :4

Enter productions Number 1 : S=AaAb

Enter productions Number 2 : S=BbBa

Enter productions Number 3 : A=\$

Enter productions Number 4 : B=\$

Find the FIRST of :S

FIRST(S)= { \$ a b }

press 'y' to continue : y

Find the FIRST of :A

FIRST(A)= { \$ }

press 'y' to continue : y

Find the FIRST of :B

FIRST(B)= { \$ }

press 'y' to continue : n

=== Code Execution Successful ===