COMPILER DESIGN – 18CSC304J

EXPERIMENT - 8 Leading and Trailing

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AIM : A program to implement Leading and Trailing

ALGORITHM :

1. For Leading, check for the first non-terminal.
2. If found, print it.
3. Look for next production for the same non-terminal.
4. If not found, recursively call the procedure for the single non-terminal present
before the
comma or End Of Production String.
5. Include it's results in the result of this non-terminal.
6. For trailing, we compute same as leading but we start from the end of the production to the beginning.
7. Stop

CODE :

```
#include<iostream.h> #include<conio.h> #include<stdio.h>
#include<string.h> #include<stdlib.h>

int vars,terms,i,j,k,m,rep,count,temp=-1;
char var[10],term[10],lead[10][10],trail[10][10]; struct grammar
{

int prodno;

_____
char lhs,rhs[20][20]; }gram[50];

void get() {

cout<<"\n---------- LEADING AND TRAILING---------------------- \n";
cout<<"\nEnter the no. of variables : ";
```

```
cin>>vars;
cout<<"\nEnter the variables :

\n"; for(i=0;i<vars;i++) {

cin>>gram[i].lhs;

var[i]=gram[i].lhs; }

cout<<"\nEnter the no. of terminals : "; cin>>terms;
cout<<"\nEnter the terminals :
"; for(j=0;j<terms;j++)

cin>>term[j];
cout<<"\n---------- PRODUCTION DETAILS---------- \n";
for(i=0;i<vars;i++)
{

} }

void leading()

cout<<"\nEnter the no. of production of "<<gram[i].lhs<<":";
cin>>gram[i].prodno;
for(j=0;j<gram[i].prodno;j++)
{

cout<<gram[i].lhs<<"->";

cin>>gram[i].rhs[j]; }

{
for(i=0;i<vars;i++)

{
for(j=0;j<gram[i].prodno;j++)

{
for(k=0;k<terms;k++)

{
if(gram[i].rhs[j][0]==term[k])
```

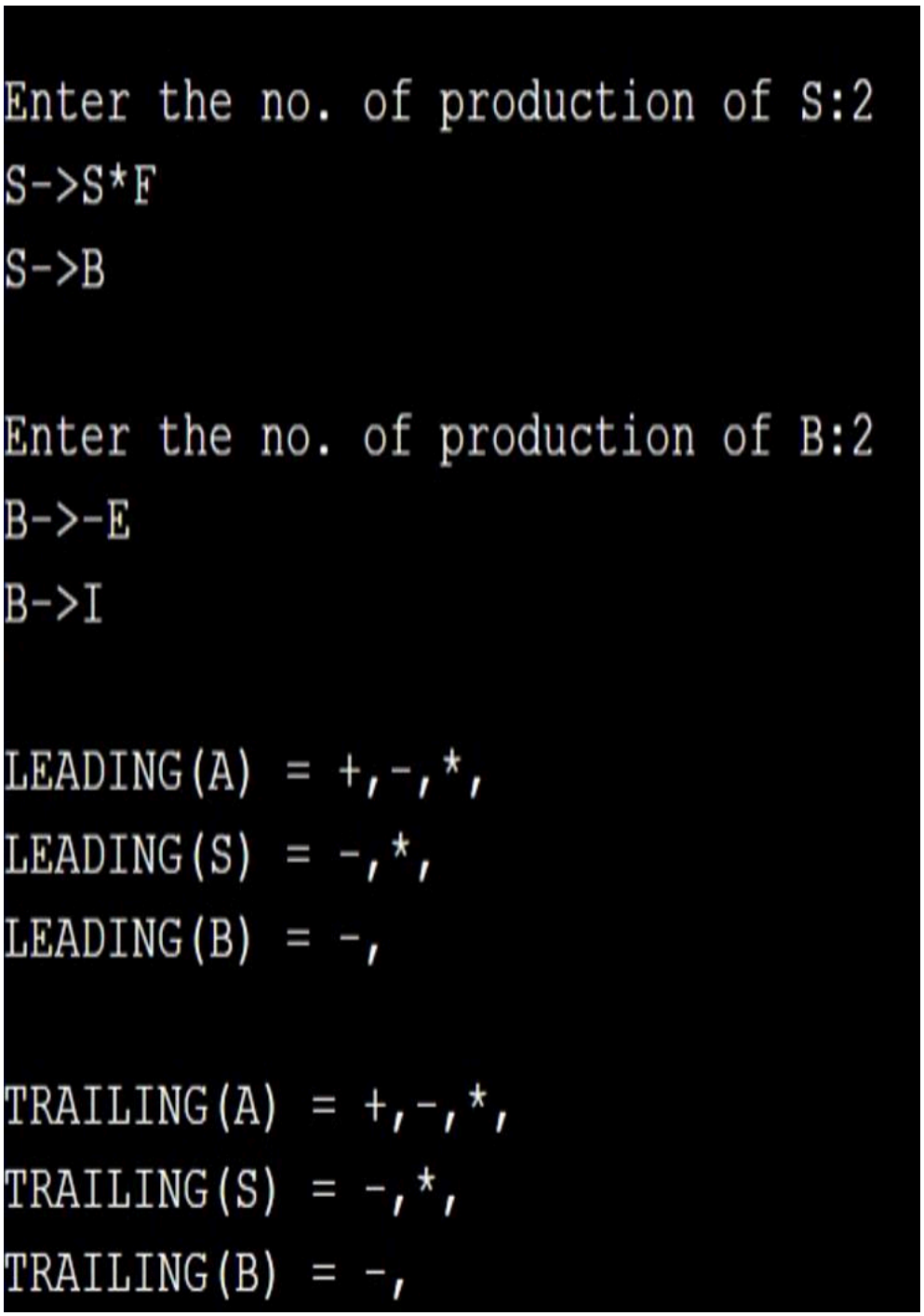
```
lead[i][k]=1;
els e
{
} }
for(rep=0;rep<vars;rep++) {
for(i=0;i<vars;i++) {
} }
if(gram[i].rhs[j][1]==term[k]) lead[i][k]=1;
for(j=0;j<gram[i].prodno;j++) {
for(m=1;m<vars;m++) {
if(gram[i].rhs[j][0]==var[m]) {
temp=m ; goto out;
}
}
} }
}
void trailing() {
for(i=0;i<vars;i++) {
} }
} }
for(j=0;j<gram[i].prodno;j++) {
out: for(k=0;k<terms;k++) {
if(lead[temp][k]==1) lead[i][k]=1;
count=0; while(gram[i].rhs[j][count]!='\x0')
```

```
count++; for(k=0;k<terms;k++)
{
if(gram[i].rhs[j][count-1]==term[k])
trail[i][k]=1;
els e
{
} }
if(gram[i].rhs[j][count-2]==term[k]) trail[i][k]=1;
for(rep=0;rep<vars;rep++) {
for(i=0;i<vars;i++) {
} }
}
void display() {
for(i=0;i<vars;i++) {
for(j=0;j<gram[i].prodno;j++) {
count=0; while(gram[i].rhs[j][count]!='\x0')
count++; for(m=1;m<vars;m++)
{
if(gram[i].rhs[j][count-1]==var[m])
temp=m;
} for(k=0;k<terms;k++) {
} }
cout<<"\nLEADING("<<gram[i].lhs<<") = "; for(j=0;j<terms;j++)
{
if(lead[i][j]==1)
```

```
if(trail[temp][k]==1) trail[i][k]=1;

} }

cout<<endl; for(i=0;i<vars;i++) {

} }

}
void main() {

clrscr(); get(); leading(); trailing(); display(); getch();

}

cout<<term[j]<<",";

cout<<"\nTRAILING("<<gram[i].lhs<<") = "; for(j=0;j<terms;j++)
{

if(trail[i][j]==1) cout<<term[j]<<",";
```

OUTPUT :

```
LEADING AND TRAILING

Enter the no. of variables : 3

Enter the variables :
A
S
B

Enter the no. of terminals : 4

Enter the terminals : +
-
*
i

PRODUCTION DETAILS

Enter the no. of production of A:2
A->A+S
A->S
```



RESULT :

The program was successfully compiled and run.