Indirect Left Recursion

#include<stdio.h>

#include<stdlib.h>

#include<string.h>

int main()

{

int n,pos,index[30][30]={{0}},i,j,k,l,p[10]={0},m,o,s,v,alpha[10]={0},beta[10]={0},index\_direct[20]={0} ;

char productions[50][50],start\_symbol='S',non\_terminal;

clrscr();

printf("Enter number of productions:");

scanf("%d",&n);

printf("\nEnter the productions:\n");

for(i=0;i<n;i++)

{ k=0;

scanf("%s",productions[i]);

index[i][k]=2;

for(j=0,k=1;j<strlen(productions[i])-1;j++)

{

if(productions[i][j]=='|')

{

index[i][k]=j;

k++;

}

}

}

for(i=1;i<n;i++)

{

j=0;k=0; v=0;

while(index[i][j]!=0)

{

if(start\_symbol == productions[i][index[i][j]+1])

{

productions[n][0] = productions[i][0];

productions[n][1] = '-';

productions[n][2] = '>';

p[v]=index[i][j]+1;

v++;

}

j++;

}

v=0; o=2;

while(p[v]!=0)

{ l=0;

while(index[0][l]!=0)

{

for(m=index[0][l]+1;productions[0][m]!='|';m++)

productions[n][++o]=productions[0][m];

for(m=p[v]+1;productions[i][m]!='|';m++)

productions[n][++o]=productions[i][m];

productions[n][++o]='|';

l++;

}

v++;

}

l=0;

while(index[i][l]!=0)

{

if(productions[i][index[i][l]+1]!=start\_symbol)

{

for(m=index[i][l]+1;productions[i][m]!='|';m++)

productions[n][++o]=productions[i][m];

productions[n][++o]='|';

}

l++;

}

}

printf("\nNew production after removing indirect recursion:");

for(i=0;i<50;i++)

printf("%c",productions[n][i]);

printf("\nAfter removing left recursion:");

for(i=0,k=0;i<strlen(productions[n])-1;i++)

{

if(productions[n][i]=='|')

{ index\_direct[k]=i;

k++;

}

}

non\_terminal = productions[n][0];

pos=0;k=0;l=0;

while(index\_direct[pos]!=0)

{

if(productions[n][index\_direct[pos]+1] == non\_terminal)

{

alpha[k]=index\_direct[pos];

k++;

}

else

{

beta[l]=index\_direct[pos];

l++;

}

pos++;

}

s=0;

printf("\n%c->",non\_terminal);

while(beta[s]!=0)

{

for(i = beta[s]+1;productions[n][i]!='|';i++)

printf("%c",productions[n][i]);

printf("%c|",non\_terminal);

s++;

}

s=0;

printf("\n%c'->",non\_terminal);

while(alpha[s]!=0)

{

for(i = alpha[s]+2;productions[n][i]!='|';i++)

printf("%c",productions[n][i]);

printf("%c'|",non\_terminal);

s++;

}

getch();

return 0;

}

