Compiler Design(18CSC304J)

Experiment 5

LEFT FACTORING

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Aim: To study and implement Left Factoring

Language: C

Procedure:

1. Start
2. Ask the user to enter the set of productions
3. Check for common symbols in the given set of productions by comparing with:
   A->aB1|aB2
1. If found, replace the particular productions with:

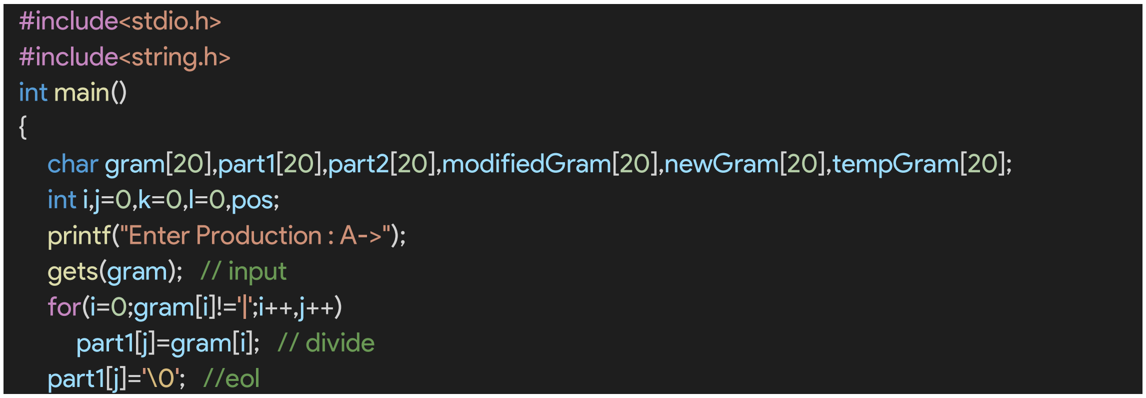
   A->aA'

   A'->B1 | B2|ε
2. Display the output
3. Exit

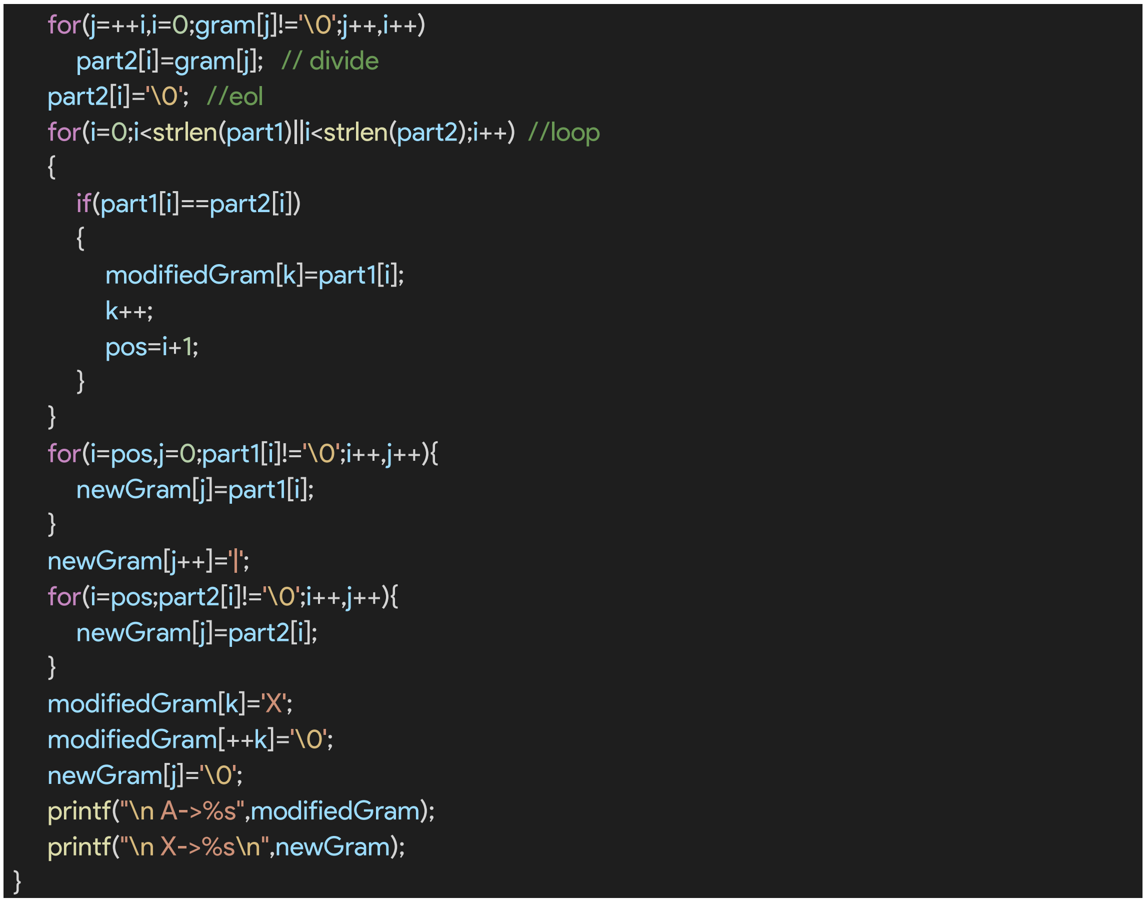
Theory:

Left factoring transforms the grammar to make it useful for top-down parsers. In this technique, we make one production for each common prefixes and the rest of the derivation is added by new productions.

Code Snippet:

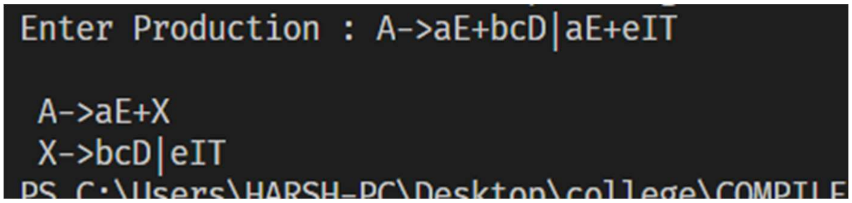


```
#include<stdio.h>
#include<string.h>
int main()
{
    char gram[20],part1[20],part2[20],modifiedGram[20],newGram[20],tempGram[20];
    int i,j=0,k=0,l=0,pos;
    printf("Enter Production : A->");
    gets(gram);  // input
    for(i=0;gram[i]!='|';i++,j++)
        part1[j]=gram[i];  // divide
    part1[j]='\0';  //eol
```



```c
    for(j=++i,i=0;gram[j]!='\0';j++,i++)
        part2[i]=gram[j];  // divide
    part2[i]='\0';  //eol
    for(i=0;i<strlen(part1)||i<strlen(part2);i++)  //loop
    {
        if(part1[i]==part2[i])
        {
            modifiedGram[k]=part1[i];
            k++;
            pos=i+1;
        }
    }
    for(i=pos,j=0;part1[i]!='\0';i++,j++){
        newGram[j]=part1[i];
    }
    newGram[j++]='|';
    for(i=pos;part2[i]!='\0';i++,j++){
        newGram[j]=part2[i];
    }
    modifiedGram[k]='X';
    modifiedGram[++k]='\0';
    newGram[j]='\0';
    printf("\n A->%s",modifiedGram);
    printf("\n X->%s\n",newGram);
}
```

Output Screenshots:



```
Enter Production : A->aE+bcD|aE+eIT

 A->aE+X
 X->bcD|eIT
PS C:\Users\HARSH-PC\Desktop\college\COMPILE
```

Result:

The code was successfully implemented in C and output was recorded. Hence, A program for implementation Of Left Factoring was compiled and run successfully