COMPILER DESIGN

(01CE0714)

2024-2025

STUDENT LAB MANUAL

INDEX

Sr. No.	Title	Date	Grade	Sign
1	Write a C Program to remove Left Recursion from grammar			
2	Write a C Program to remove Left Factoring from grammar			
3	Write a C program to implement finite automata and string validation.			
4	Prepare report for Lex and install Lex on Linux/Windows			
5	(a) WALEx Program to count words, characters, lines, Vowels and consonants from given input (b) WALEx Program to generate string which is ending with zeros.			
6	(a) WALex Program to generate Histogram of words (b) WALex Program to remove single or multi line comments from C program.			
7	WALex Program to check weather given statement is compound or simple.			
8	WALex Program to extract HTML tags from .html file.			
9	Write a C Program to compute FIRST Set of the given grammar			
10	Write a C Program to compute FOLLOW Set of the given grammar			
11	Write a C Program to implement Operator precedence parser			
12	Write a C Program for constructing LL (1) parsing			
13	Write a C program to implement SLR parsing			
14	Prepare a report on YACC and generate Calculator Program using YACC.			

Practical 1

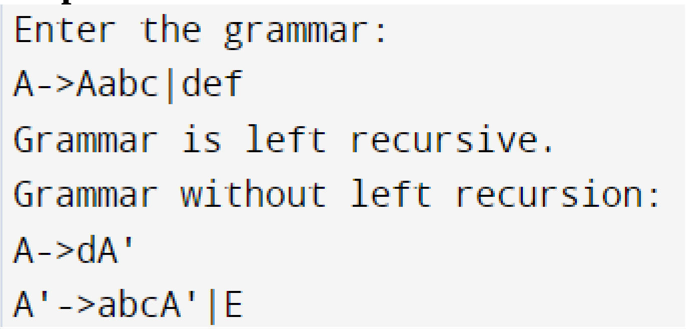
Title: Write a C Program to remove Left Recursion from the grammar.

Hint : The program reads a grammar production, checks for left recursion, extracts `α` and `β`, and then constructs and prints a new grammar without left recursion using the transformations \(A \rightarrow βA' \) and \(A' \rightarrow αA' | \epsilon \).

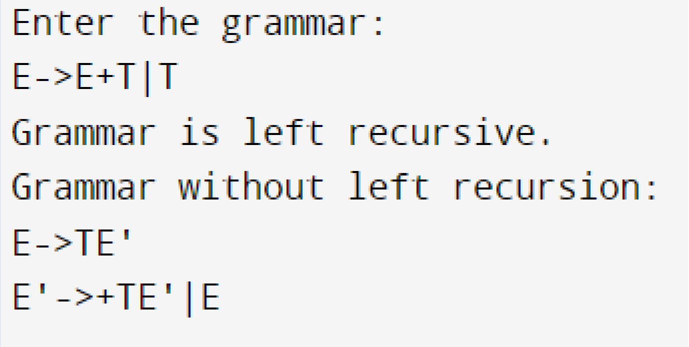
Program :

```
#include<stdio.h>
#define SIZE 10
void main () {
  char non_terminal;
  char beta,alpha[6];
  char production[SIZE];
  int index=3;
  int i=0,j=0;            /* starting of the string following "->" */
  printf("Enter the grammar:\n");
  scanf("%s",&production);
  non_terminal=production[0];
  if(non_terminal==production[index]) {

    for(i=index+1;production[i]!='|';i++)
    {
     alpha[j]=production[i];
     j++;
    }
    alpha[j]='\0';

    printf("Grammar is left recursive.\n");
    while(production[index]!=0 && production[index]!='|')
      index++;
    if(production[index]!=0) {
      beta=production[index+1];
      printf("Grammar without left recursion:\n");
      printf("%c->%c%c\'",non_terminal,beta,non_terminal);
      printf("\n%c\'->%s%c\'|E\n",non_terminal,alpha,non_terminal);
    }
  else
   printf("Grammar can't be reduced\n");
 }
 else
  printf("Grammar is not left recursive.\n");
}
```

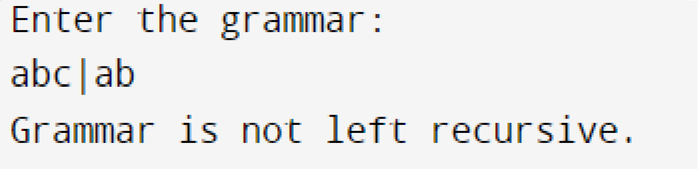
Output:



```
Enter the grammar:
A->Aabc|def
Grammar is left recursive.
Grammar without left recursion:
A->dA'
A'->abcA'|E
```



```
Enter the grammar:
E->E+T|T
Grammar is left recursive.
Grammar without left recursion:
E->TE'
E'->+TE'|E
```



```
Enter the grammar:
abc|ab
Grammar is not left recursive.
```

Practical 2

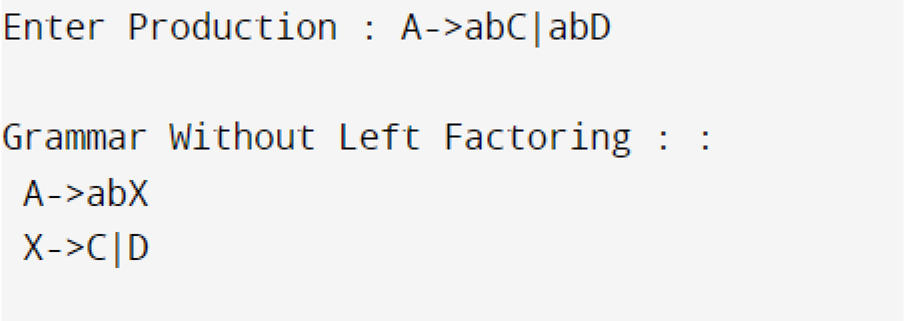
Title: Write a C Program to remove Left Factoring from the grammar.

Hint : This program reads a production of the form A->part1|part2, finds the common prefix in part1 and part2, and then restructures the grammar to eliminate left factoring.

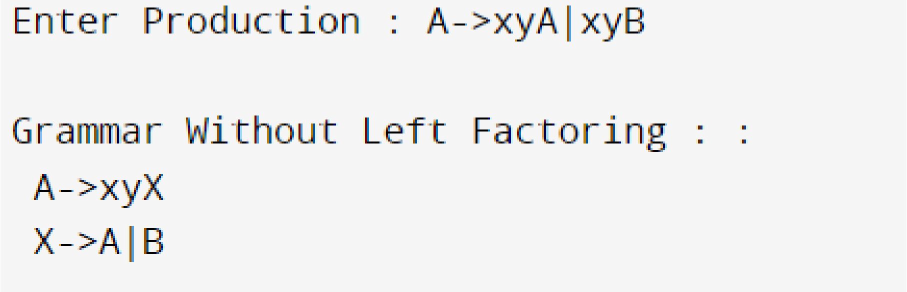
Program:

```
#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);
   for(i=0;gram[i]!='|';i++,j++)
      part1[j]=gram[i];
   part1[j]='\0';
   for(j=++i,i=0;gram[j]!='\0';j++,i++)
      part2[i]=gram[j];
   part2[i]='\0';
   for(i=0;i<strlen(part1)||i<strlen(part2);i++){
      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("\nGrammar Without Left Factoring : : \n");
   printf(" A->%s",modifiedGram);
   printf("\n X->%s\n",newGram);
}
```

Output:



```
Enter Production : A->abC|abD

Grammar Without Left Factoring : :
 A->abX
 X->C|D
```



```
Enter Production : A->xyA|xyB

Grammar Without Left Factoring : :
 A->xyX
 X->A|B
```