Experiment - 5 WAP to remove left recursion from a grammar

Name:	**Shaikh Shadab**	**Rollno**	**:**	**17DCO74**
Class :	**TE.CO**	**Batch**	**:**	**B3**

#Source Code

```
__author__ = 'Shadab Shaikh'
__title__ = 'Finding & resolving left recursion from a grammar'
__date__ = '26-02-2019'
__version__ = '1.0'

print('Author        : ' + __author__)
print('Title         : ' + __title__)
print('Date          : ' + __date__)
print('Version       : ' + __version__)

grammararr=[]        #stores the grammar maintaining the index
alpharest=[]         #stores the alpha and rest values
beta=[]              #stores beta
inputs=""
newprod=""           #to display new production
while(inputs!='no'):
    grammar = input("\nEnter the grammar left should be variable following with ->
format eg: S->a\n")
    grammar=grammar.replace(" ","")          #replacing whitespaces with none
    if(grammar[0].islower()):
        grammar[0].upper()                   #making left most as variable
    grammararr.append(grammar)               #storing into list
    inputs = input("\nPress no to stop writing productions or write anything to continue")
                                         #asking for the continuity of grammar



def findalpharest(grammararr,k):
    """function to find alpha and rest values"""
    if(grammararr[k][0]==grammararr[k][3]):
        alpharest.append(grammararr[k][0]+grammararr[k][4:])
    k+=1
    if(k<len(grammararr)):
        findalpharest(grammararr,k)


findalpharest(grammararr,0)              #calling findalpharest function

def findbeta(grammararr,alpharest,l,m):
    """function to find beta for corresponding alpha values"""
    if(grammararr[l][0]==alpharest[m][0]):
        if(grammararr[l][0]!=grammararr[l][3]):
            beta.append(grammararr[l][0]+grammararr[l][3])
    l+=1
    if(l<len(grammararr)):
        findbeta(grammararr,alpharest,l,m)
    else:
        l=0
        m+=1
        if(m<len(alpharest)):
            findbeta(grammararr,alpharest,l,m)

findbeta(grammararr,alpharest,0,0)    #calling findbeta function

def formnewprod(grammararr,alpharest,beta,i,j):
    #function to print new production
    print(alpharest[i][0]+"->"+beta[j][1]+alpharest[i][0]+"'")
    print(alpharest[i][0]+"'"+"->"+alpharest[i][1]+alpharest[i][0]+"'")
    print(alpharest[i][0]+"'"+"#")
    i+=1
    j+=1
    if(i<len(alpharest) and j<len(beta)):
        formnewprod(grammararr,alpharest,beta,i,j)


formnewprod(grammararr,alpharest,beta,0,0)            #calling formnewprod function

#print(*alpharest, sep='\n')
#print(*beta, sep='\n')
```

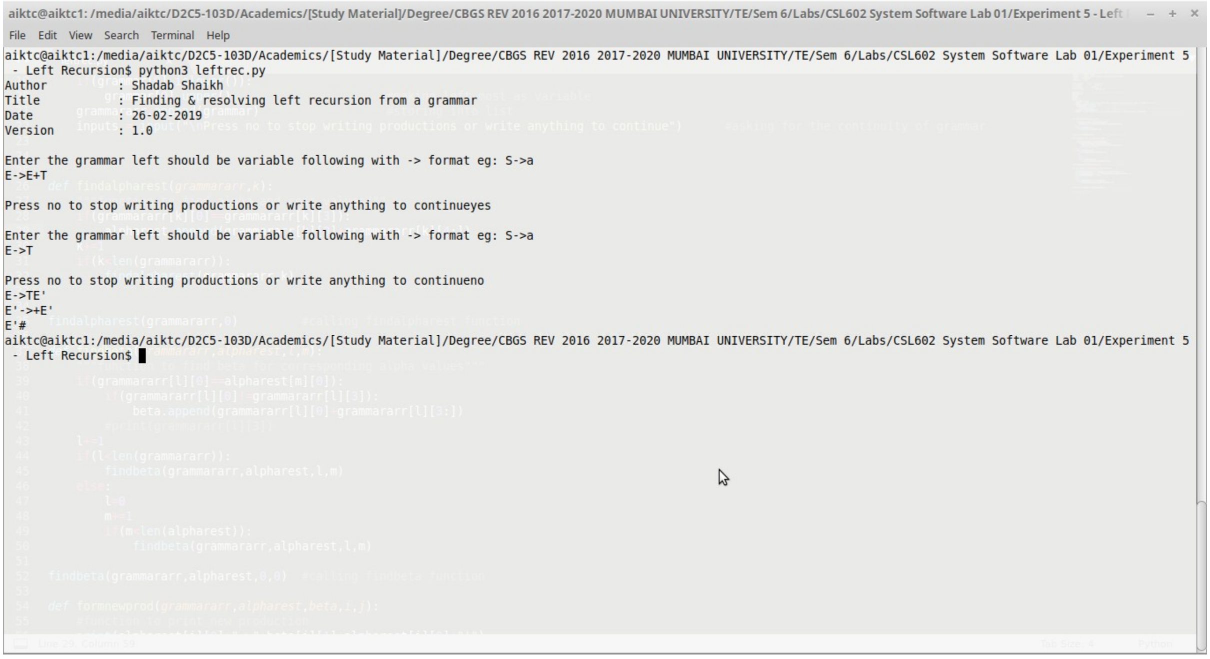
#Sample input

**1.	E->E+T/T**

**2.	S->(L)/x**
L-Ls/s

#Output

1. Output for the 1st sample input


aiktc@aiktc1: /media/aiktc/D2C5-103D/Academics/[Study Material]/Degree/CBGS REV 2016 2017-2020 MUMBAI UNIVERSITY/TE/Sem 6/Labs/CSL602 System Software Lab 01/Experiment 5 - Left
File Edit View Search Terminal Help

```
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 - Left Recursion$ python3 leftrec.py
Author       : Shadab Shaikh
Title        : Finding & resolving left recursion from a grammar
Date         : 26-02-2019
Version      : 1.0

Enter the grammar left should be variable following with -> format eg: S->a
E->E+T

Press no to stop writing productions or write anything to continueyes

Enter the grammar left should be variable following with -> format eg: S->a
E->T

Press no to stop writing productions or write anything to continueno
E->TE'
E'->+E'
E'#
aiktc@aiktc1:/media/aiktc/D2C5-103D/Academics/[Study Material]/Degree/CBGS REV 2016 2017-2020 MUMBAI UNIVERSITY/TE/Sem 6/Labs/CSL602 System Software Lab 01/Experiment 5
 - Left Recursion$ 
```
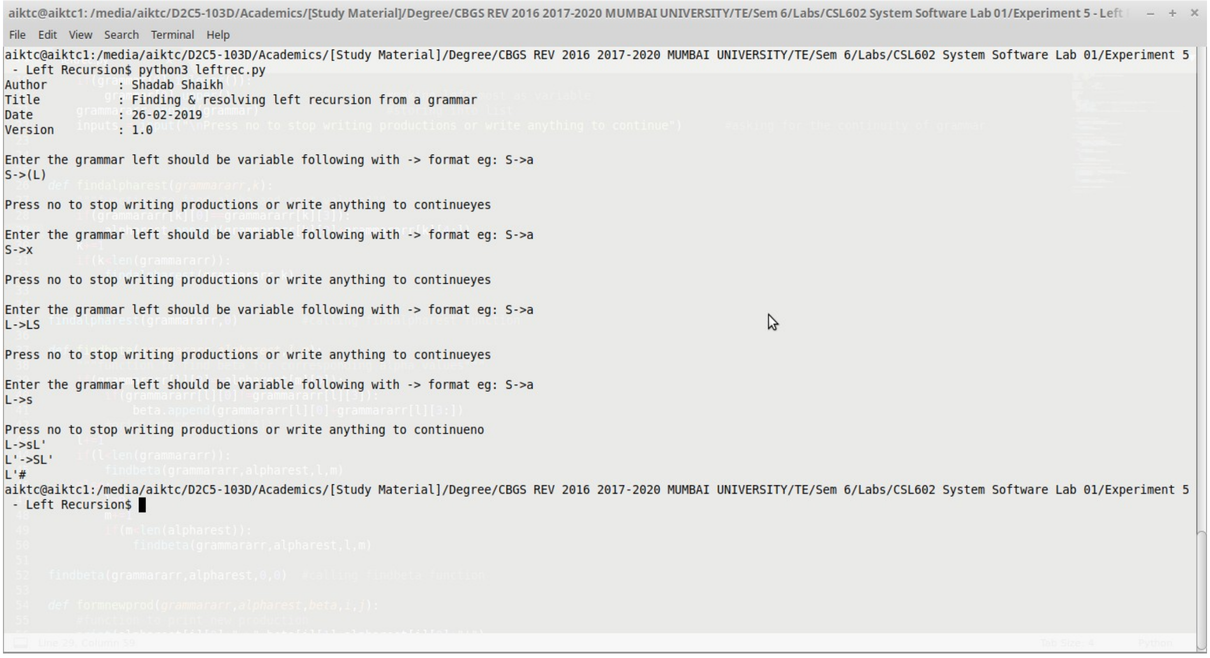

2. Output for the 2nd sample input


aiktc@aiktc1: /media/aiktc/D2C5-103D/Academics/[Study Material]/Degree/CBGS REV 2016 2017-2020 MUMBAI UNIVERSITY/TE/Sem 6/Labs/CSL602 System Software Lab 01/Experiment 5 - Left
File Edit View Search Terminal Help

```
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 - Left Recursion$ python3 leftrec.py
Author       : Shadab Shaikh
Title        : Finding & resolving left recursion from a grammar
Date         : 26-02-2019
Version      : 1.0

Enter the grammar left should be variable following with -> format eg: S->a
S->(L)

Press no to stop writing productions or write anything to continueyes

Enter the grammar left should be variable following with -> format eg: S->a
S->x

Press no to stop writing productions or write anything to continueyes

Enter the grammar left should be variable following with -> format eg: S->a
L->LS

Press no to stop writing productions or write anything to continueyes

Enter the grammar left should be variable following with -> format eg: S->a
L->s

Press no to stop writing productions or write anything to continueno
L->sL'
L'->SL'
L'#
aiktc@aiktc1:/media/aiktc/D2C5-103D/Academics/[Study Material]/Degree/CBGS REV 2016 2017-2020 MUMBAI UNIVERSITY/TE/Sem 6/Labs/CSL602 System Software Lab 01/Experiment 5
 - Left Recursion$ 
```