Kathmandu University

Department of Computer Science and Engineering

Dhulikhel, Kavre

Lab 2

[Code No: Comp 409]

(For partial fulfillment of 4th Year/1st Semester Computer Engineering)

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1. Write a program to remove the left recursion from the given grammar.|

Given a Grammar G (V, T, P, S) is left recursive if it has a production in the form.

A → A α |β
Or
A→A α1|A α2|β 1|β 2 and so on ..

The above Grammar is left recursive because the left of production is occurring at a first position on the right side of production. It can eliminate left recursion by replacing a pair of production with

A → βA′
A → αA′|ϵ

For the first case and for 2nd case

A → β1A′|β2A′
A → α1A′|α2A′|ϵ

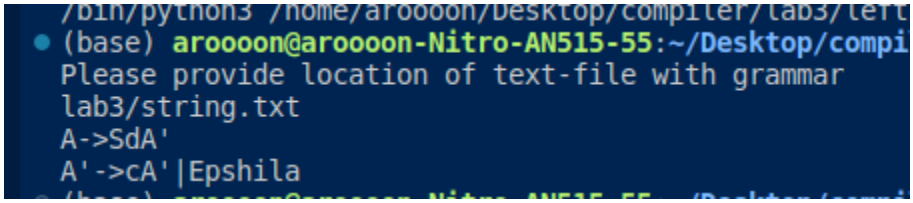
Source Code:

```
from  typing import *
def printans(arr:List)->None:
   for ans in arr:
       print(ans)

def driver(directory:str)->None:

   with open(directory,'r') as file:
       s = file.readline()
       # E->E+T/T
   f = s[0]
   other = s[3:]
   a =  []
   beta =[]
   li = other.strip('\n').split('|')
   beta_count=0
   for st in li:
```

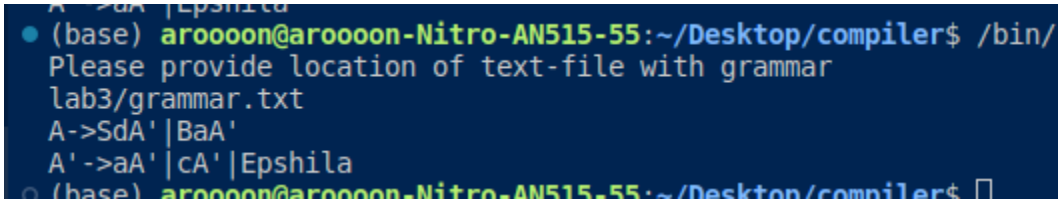
```
        if f == st[0]:
            a.append(st[1:])
        else:
            beta_count += 1
            beta.append(st)

    part1 = ""
    part2 =" "

    final_answer = []

    if len(a)!=0:
        fd = f+"'"
        part1 = f + "->"
        part2 = fd+"->"
        for i in range(len(a)):

            if i==len(a)-1:
                part1 += beta[i] + fd
            else:
                part1 += beta[i] + fd  + "|"

            part2 += a[i]+fd  + "|"


        part2+= "Epshila"
        final_answer.append(part1)
        final_answer.append(part2)

        printans(final_answer)
    else:
        print("Sorry no left recursion found")

if __name__ == "__main__":
    directory = input("Please provide location of text-file with grammar
\n")
    driver(directory)
```

Output :

- **For string:A->Ac|Sd**



- **For string:A->Aa|Ac|Sd|Ba**



- **For string :A->Ba|Cc**