

Python CODE

```
n=int(input("Enter no of Productions: "))
a=[]
for i in range (n):
    x=input("Enter: ")
    a.append(x)
rules = {}
terms = []
for i in a:
    temp = i.split("=")
    terms.append(temp[0])
    try:
        rules[temp[0]] += [temp[1]]
    except:
        rules[temp[0]] = [temp[1]]

terms = list(set(terms))
print(rules,terms)

def leading(gram, rules, term, start):
    s = []
    if gram[0] not in terms:
        return gram[0]
    elif len(gram) == 1:
        return [0]
    elif gram[1] not in terms and gram[-1] is not start:
        for i in rules[gram[-1]]:
            s+= leading(i, rules, gram[-1], start)
        s+= [gram[1]]
    return s

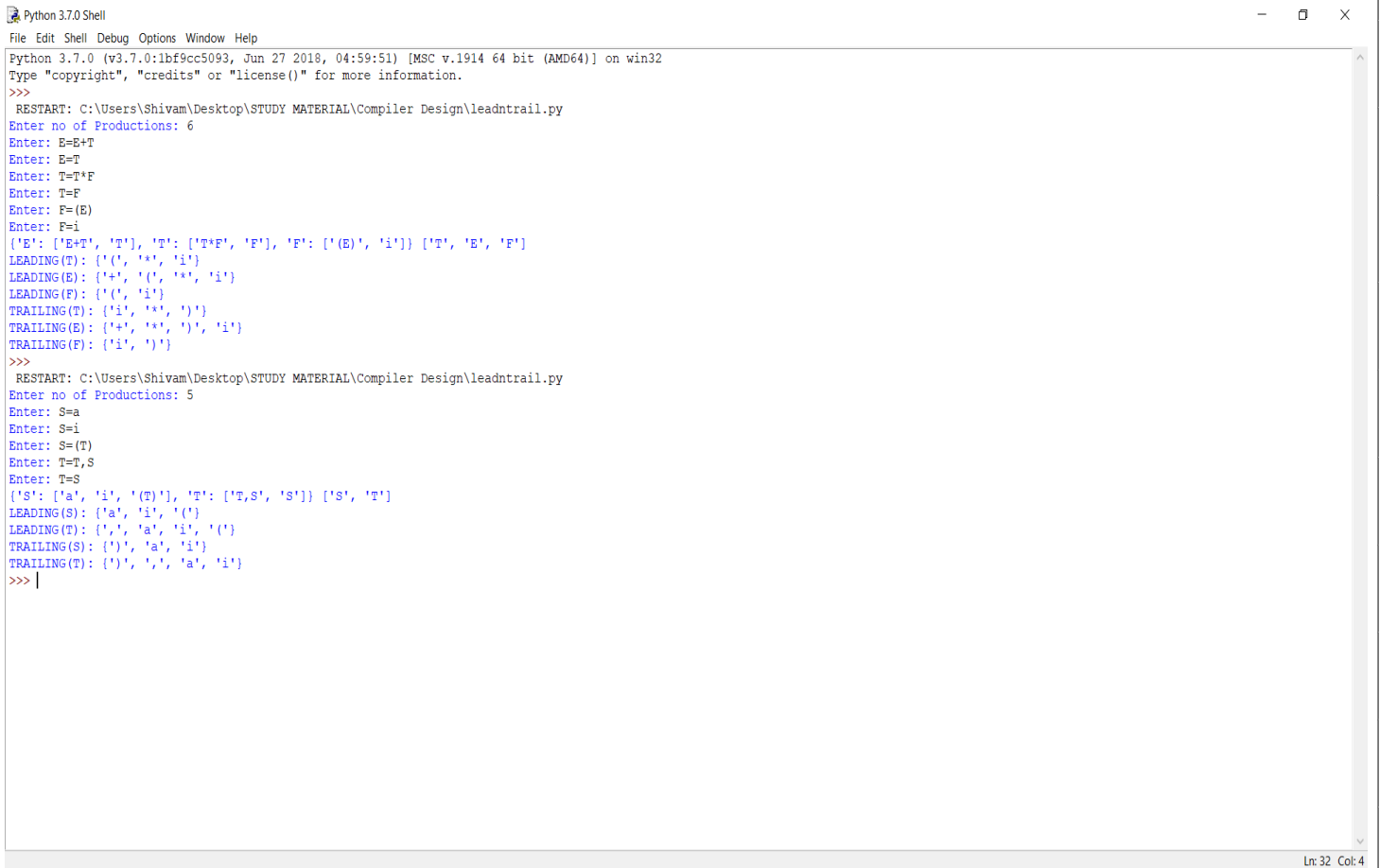
def trailing(gram, rules, term, start):
    s = []
    if gram[-1] not in terms:
        return gram[-1]
    elif len(gram) == 1:
        return [0]
    elif gram[-2] not in terms and gram[-1] is not start:
```

```
for i in rules[gram[-1]]:
    s+= trailing(i, rules, gram[-1], start)
    s+= [gram[-2]]
return s
```

```
leads = {}
trails = {}
for i in terms:
    s = [0]
    for j in rules[i]:
        s+=leading(j,rules,i,i)
    s = set(s)
    s.remove(0)
    leads[i] = s
    s = [0]
    for j in rules[i]:
        s+=trailing(j,rules,i,i)
    s = set(s)
    s.remove(0)
    trails[i] = s
```

```
for i in terms:
    print("LEADING("+i+"):",leads[i])
for i in terms:
    print("TRAILING("+i+"):",trails[i])
```

IMPLEMENTATION



```
Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:59:51) [MSC v.1914 64 bit (AMD64)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
RESTART: C:\Users\Shivam\Desktop\STUDY MATERIAL\Compiler Design\leadntrail.py
Enter no of Productions: 6
Enter: E=E+T
Enter: E=T
Enter: T=T*F
Enter: T=F
Enter: F=(E)
Enter: F=i
{'E': ['E+T', 'T'], 'T': ['T*F', 'F'], 'F': ['(E)', 'i']} ['T', 'E', 'F']
LEADING(T): {'(', '*', 'i'}
LEADING(E): {'+', '(', '*', 'i'}
LEADING(F): {'(', 'i'}
TRAILING(T): {'i', '*', ')'}
TRAILING(E): {'+', '*', ')', 'i'}
TRAILING(F): {'i', ')'}
>>>
RESTART: C:\Users\Shivam\Desktop\STUDY MATERIAL\Compiler Design\leadntrail.py
Enter no of Productions: 5
Enter: S=a
Enter: S=i
Enter: S=(T)
Enter: T=T,S
Enter: T=S
{'S': ['a', 'i', '(T)'], 'T': ['T,S', 'S']} ['S', 'T']
LEADING(S): {'a', 'i', '('}
LEADING(T): {'(', 'a', 'i', '('}
TRAILING(S): {'', 'a', 'i'}
TRAILING(T): {'', '(', 'a', 'i'}
>>> |
```

Ln: 32 Col: 4

RESULT

Code was successfully implemented and the output was verified.