Practical File

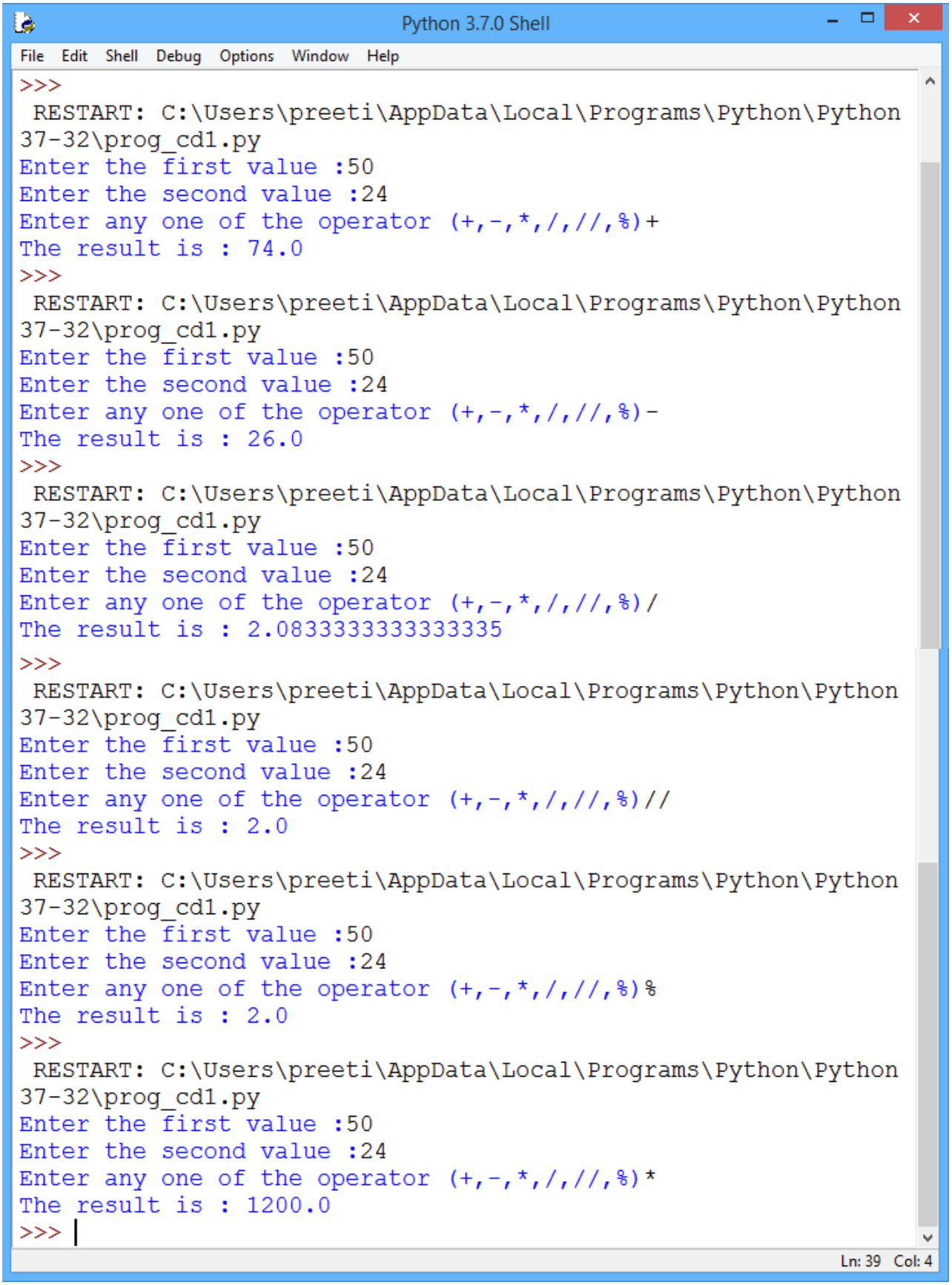
Class XII - Computer Science with Python(083)

Program 1: Program to enter two numbers and print the arithmetic operations like +,-,*, /, // and %.

Solution:

```
#Program for Arithmetic Calculator

result = 0

val1 = float(input("Enter the first value :"))

val2 = float(input("Enter the second value :"))

op = input("Enter any one of the operator (+,-,*,/,//,%)")

if op == "+":

   result = val1 + val2

elif op == "-":

   result = val1 - val2

elif op == "*":

   result = val1 * val2

elif op == "/":

   if val2 == 0:

      print("Please enter a value other than 0")

   else:

      result = val1 / val2

elif op == "//":

   result = val1 // val2

else:

   result = val1 % val2
```

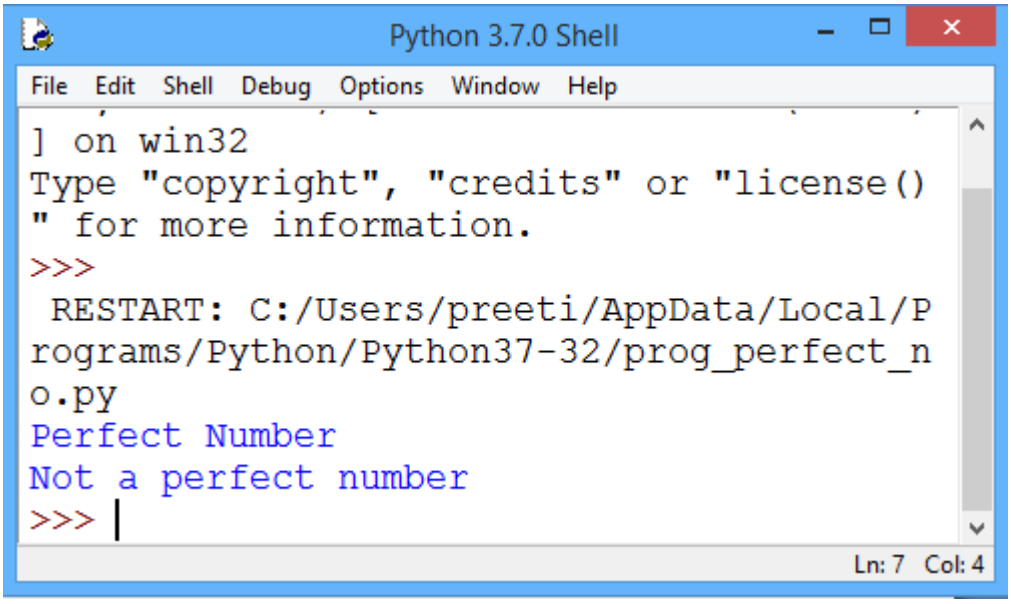
```
print("The result is :",result)
```


Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
>>>
RESTART: C:\Users\preeti\AppData\Local\Programs\Python\Python37-32\prog_cd1.py
Enter the first value :50
Enter the second value :24
Enter any one of the operator (+,-,*,/,//,%)+
The result is : 74.0
>>>
RESTART: C:\Users\preeti\AppData\Local\Programs\Python\Python37-32\prog_cd1.py
Enter the first value :50
Enter the second value :24
Enter any one of the operator (+,-,*,/,//,%)-
The result is : 26.0
>>>
RESTART: C:\Users\preeti\AppData\Local\Programs\Python\Python37-32\prog_cd1.py
Enter the first value :50
Enter the second value :24
Enter any one of the operator (+,-,*,/,//,%)/
The result is : 2.0833333333333335
>>>
RESTART: C:\Users\preeti\AppData\Local\Programs\Python\Python37-32\prog_cd1.py
Enter the first value :50
Enter the second value :24
Enter any one of the operator (+,-,*,/,//,%)//
The result is : 2.0
>>>
RESTART: C:\Users\preeti\AppData\Local\Programs\Python\Python37-32\prog_cd1.py
Enter the first value :50
Enter the second value :24
Enter any one of the operator (+,-,*,/,//,%)%
The result is : 2.0
>>>
RESTART: C:\Users\preeti\AppData\Local\Programs\Python\Python37-32\prog_cd1.py
Enter the first value :50
Enter the second value :24
Enter any one of the operator (+,-,*,/,//,%)*
The result is : 1200.0
>>>
Ln: 39 Col: 4

Program 2: Write a program to find whether an inputted number is perfect or not.

Solution:

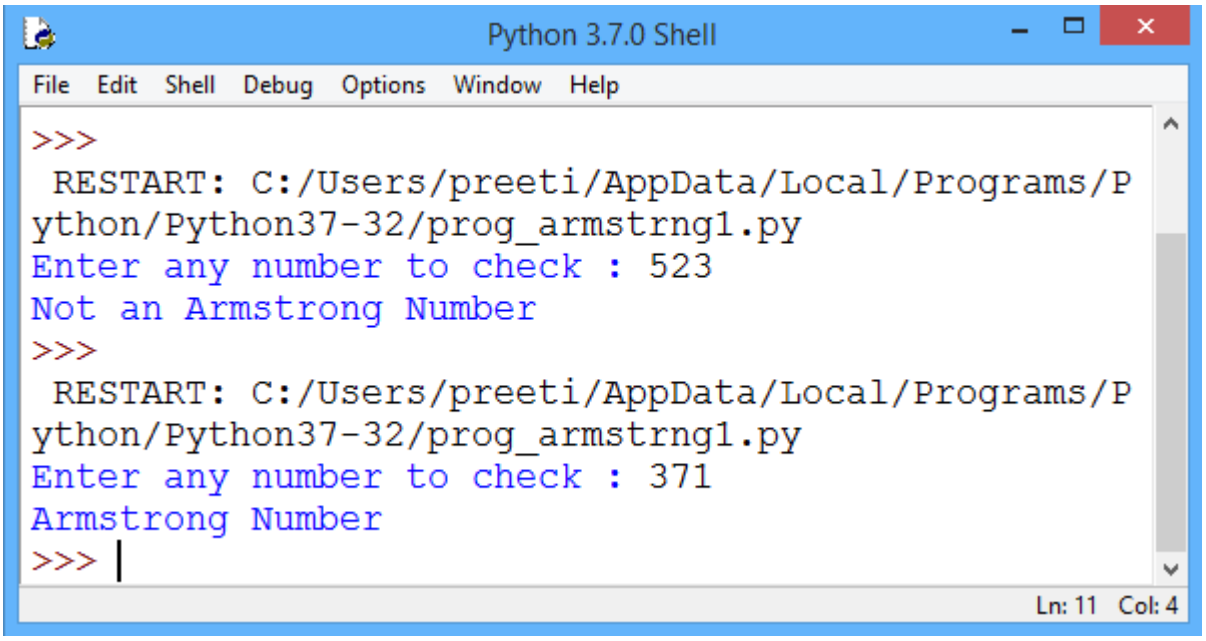
```
# To find whether a number is perfect or not

def pernum(num):

   divsum=0

   for i in range(1,num):

      if num%i == 0:

         divsum+=i

   if divsum==num:

      print('Perfect Number')

   else:

      print('Not a perfect number')


pernum(6)

pernum(15)
```



Program 3: Write a Program to check if the entered number is Armstrong or not.

Solution:

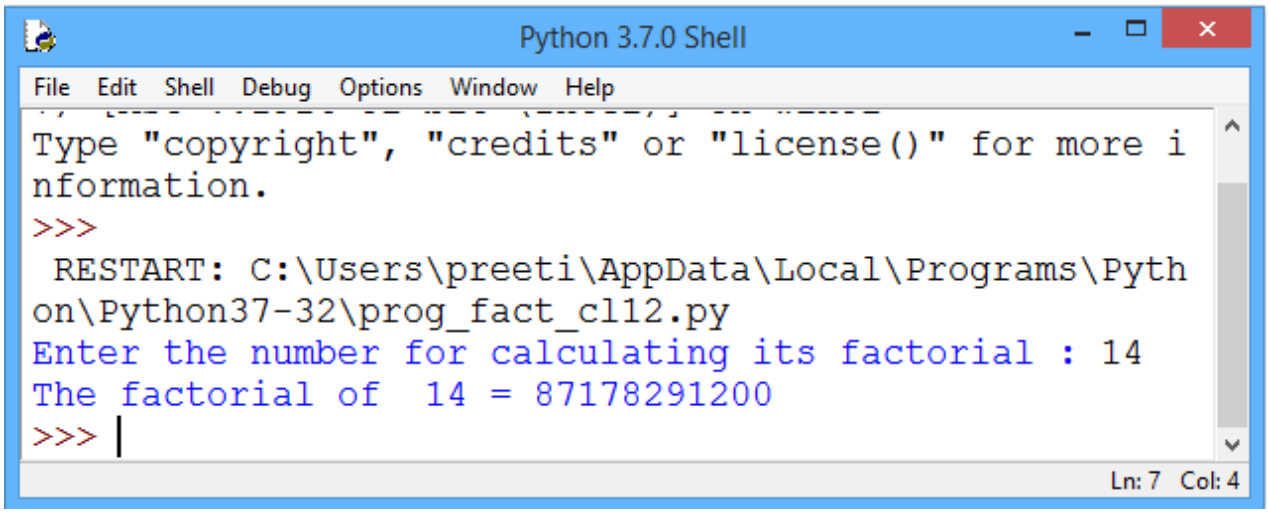
```
# Program to check if the entered number is Armstrong or not.

#An Armstrong number has sum of the cubes of its digits is equal to the number itself

no=int(input("Enter any number to check : "))

no1 = no

sum = 0

while(no>0):

    ans = no % 10;

    sum = sum + (ans * ans * ans)

    no = int (no / 10)

if sum == no1:

    print("Armstrong Number")

else:

    print("Not an Armstrong Number")
```



Program 4: Write a Program to find factorial of the entered number.

Solution:

```
#Program to calculate the factorial of an inputted number (using while loop)

num = int(input("Enter the number for calculating its factorial : "))

fact = 1

i = 1

while i<=num:

   fact = fact*i

   i = i + 1

print("The factorial of ",num,"=",fact)
```

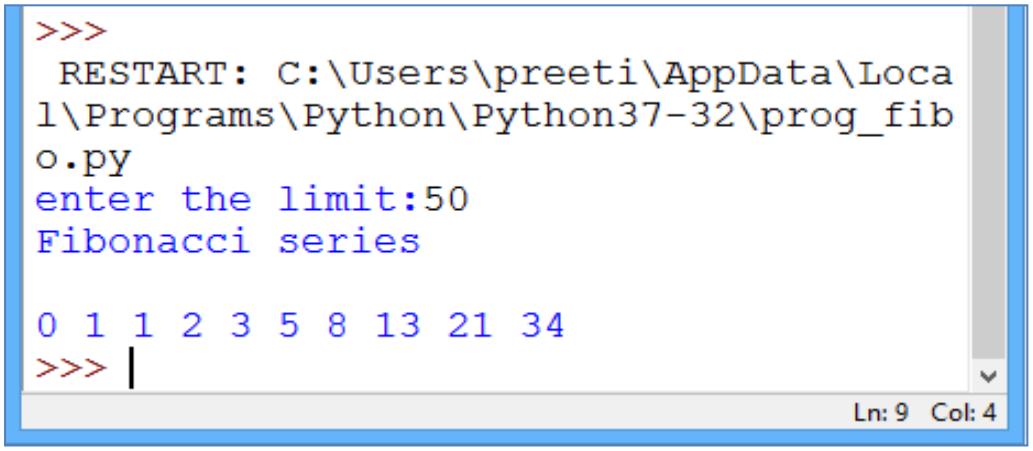


Program 5: Write a Program to enter the number of terms and to print the Fibonacci Series.

Solution:

```
#fibonacci

i =int(input("enter the limit:"))

x = 0
```

```
y = 1

z = 1

print("Fibonacci series \n")

print(x, y,end= " ")

while(z<= i):

   print(z, end=" ")

   x = y

   y = z

   z = x + y
```



Program 6: Write a Program to enter the string and to check if it's palindrome or not using loop.

Solution:

```
# Program to enter the string and check if it's palindrome or not using 'for' loop.

msg=input("Enter any string : ")

newlist=[]

newlist[:0]=msg

l=len(newlist)

ed=l-1

for i in range(0,l):
```

```
    if newlist[i]!=newlist[ed]:
        print ("Given String is not a palindrome")
        break
    if i>=ed:
        print ("Given String is a palindrome")
        break
    l=l-1
    ed = ed - 1
```

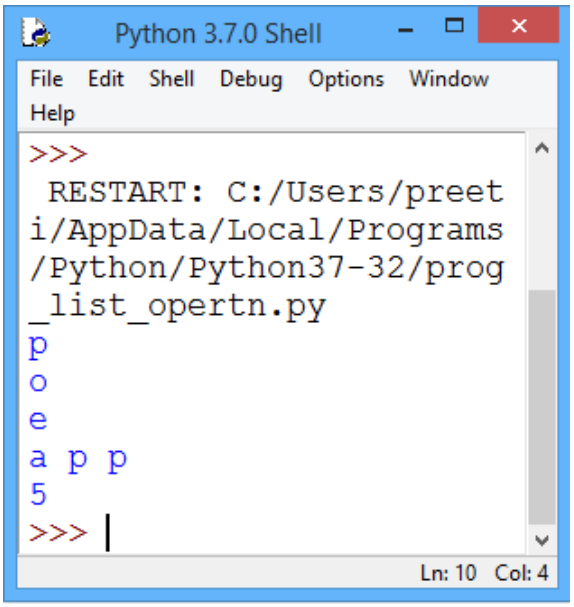
```
>>>
 RESTART: C:/Users/preeti/AppData/Local/Program
s/Python/Python37-32/prog_palind.py
Enter any string : NITIN
Given String is a palindrome
>>>
 RESTART: C:/Users/preeti/AppData/Local/Program
s/Python/Python37-32/prog_palind.py
Enter any string : PYTHON
Given String is not a palindrome
>>>
                                                Ln: 17  Col: 4
```

Program 7: Write a Program to show the outputs based on entered list.

Solution:

```
my_list = ['p','r','o','b','e']

# Output: p

print(my_list[0])

# Output: o

print(my_list[2])

# Output: e

print(my_list[4])

# Error! Only integer can be used for indexing
```

```
# my_list[4.0]

# Nested List

n_list = ["Happy", [2,0,1,5]]

# Nested indexing

# Output: a

print(n_list[0][1],n_list[0][2],n_list[0][3])

# Output: 5

print(n_list[1][3])
```

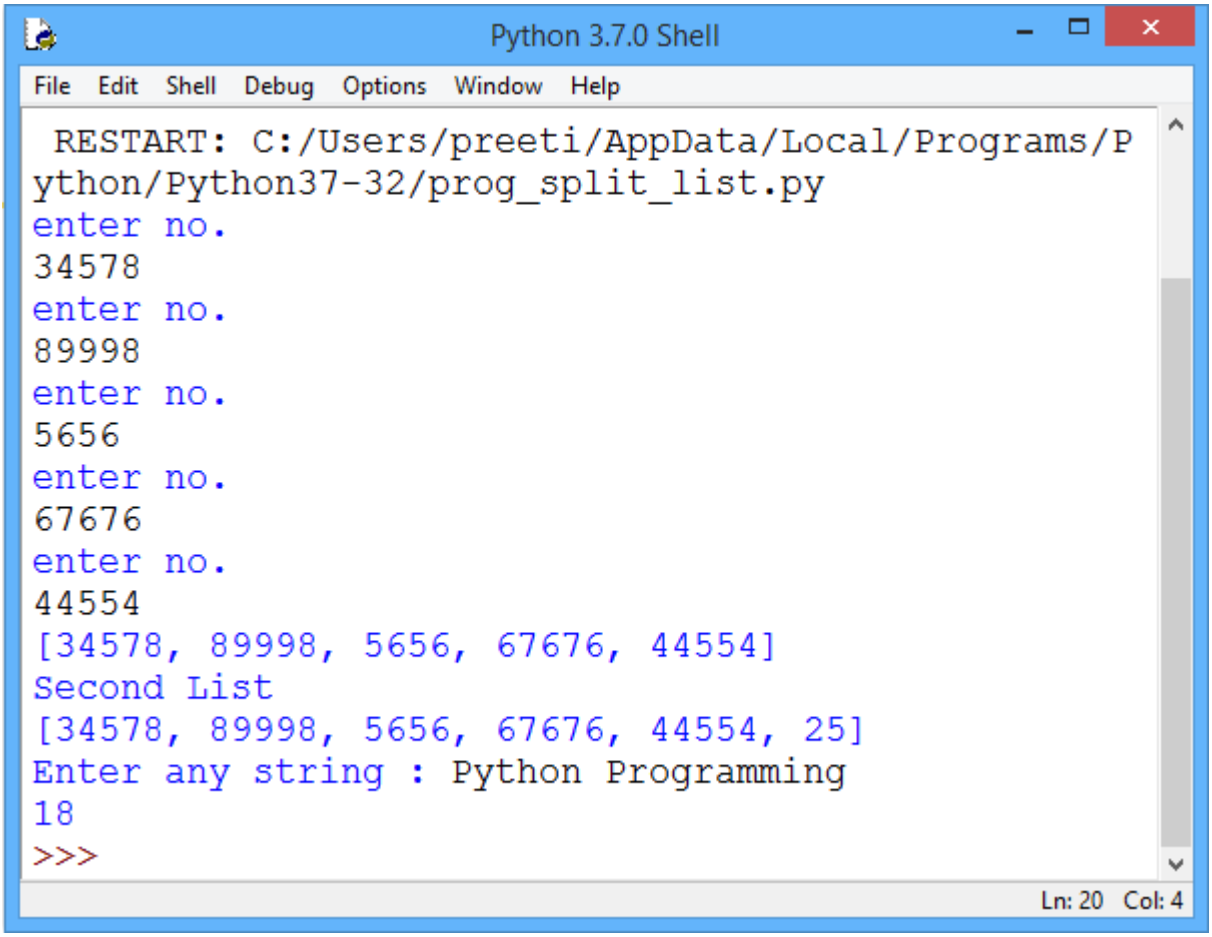


Program 8: Write a Program to enter the numbers in a list using split () and to use all the functions related to list.

Solution:

```
#Program to enter the numbers in a list using split () and to use all the functions related to list.

# numbers = [int(n, 10) for n in input().split(",")]

# print (len(numbers))

 memo=[]

for i in range (5):
```

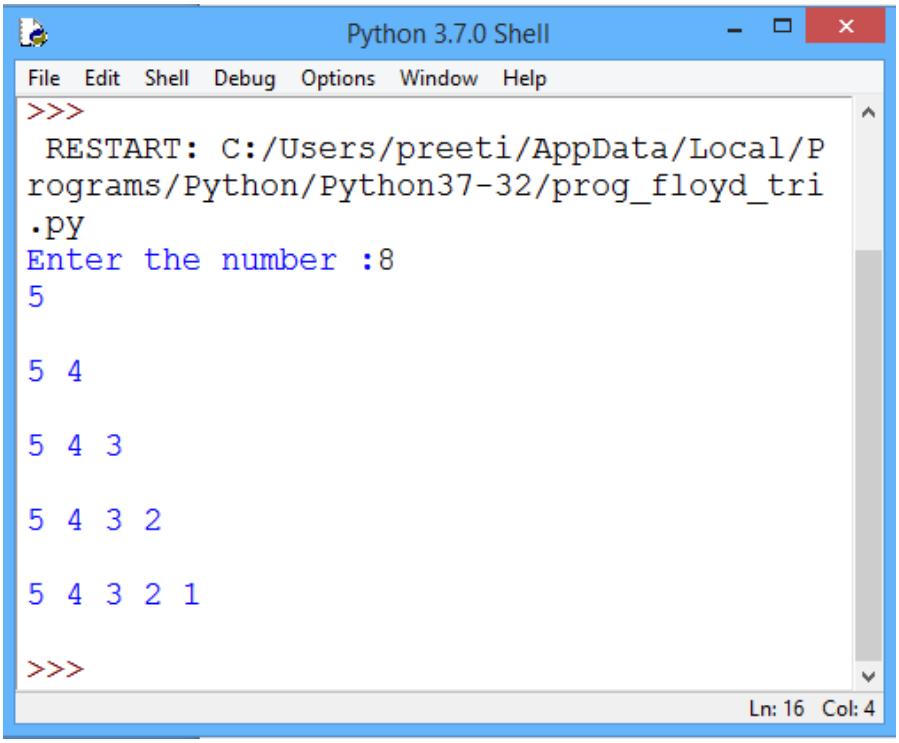
```
    x=int(input("enter no. \n"))
    memo.insert(i,x)
    i+=1
print(memo)
memo.append(25)
print("Second List")
print(memo)
msg=input("Enter any string : ")
newlist=[]
newlist[:0]=msg
l=len(newlist)
print(l)
```



Program 9: Write a Program to enter the number and print the Floyd's Triangle in decreasing order.

Solution:

```
#Floyd's triangle

n=int(input("Enter the number :"))

for i in range(5,0,-1):

   for j in range(5,i-1,-1):

      print (j,end=' ')

   print('\n')
```

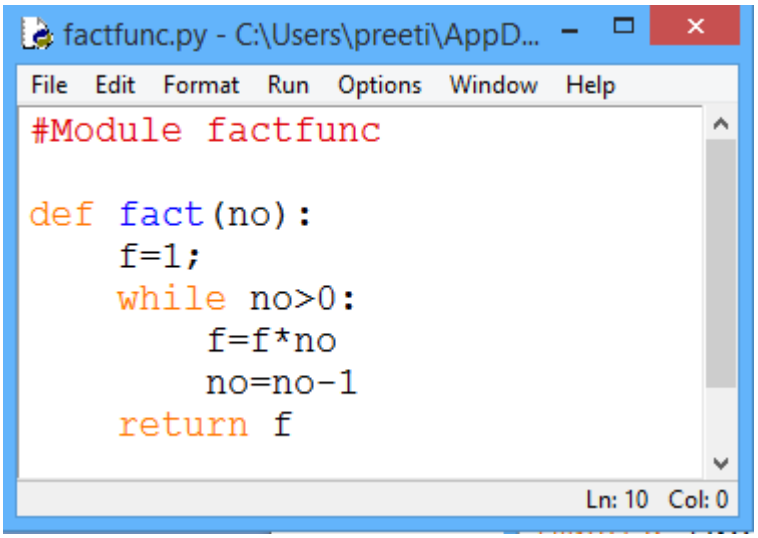


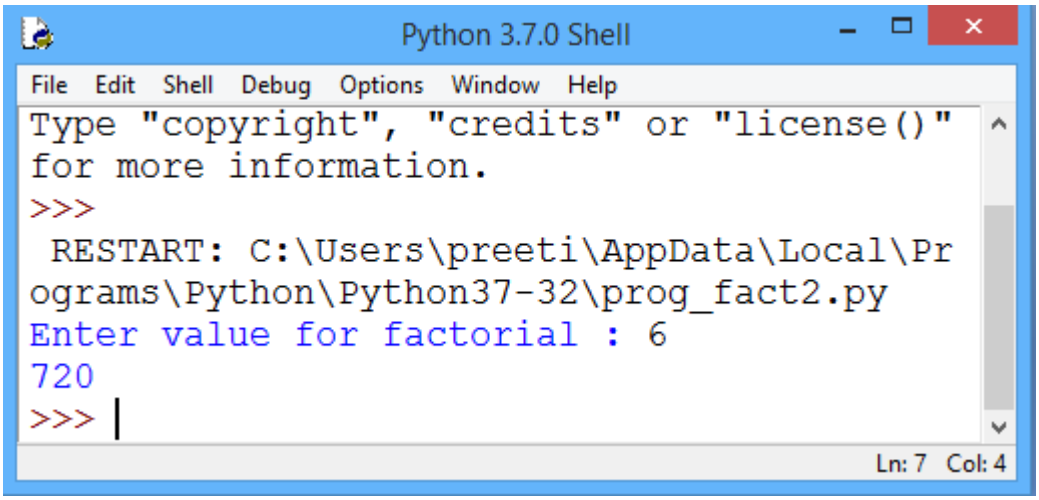
Program 10: Write a Program to find factorial of entered number using user-defined module fact().

Solution:

```
#Using function

import factfunc

x=int(input("Enter value for factorial : "))

ans=factfunc.fact(x)
```

print (ans)





Program 11: Write a Program to enter the numbers and find Linear Search, Binary Search, Lowest Number and Selection Sort using list/array code.

Solution:

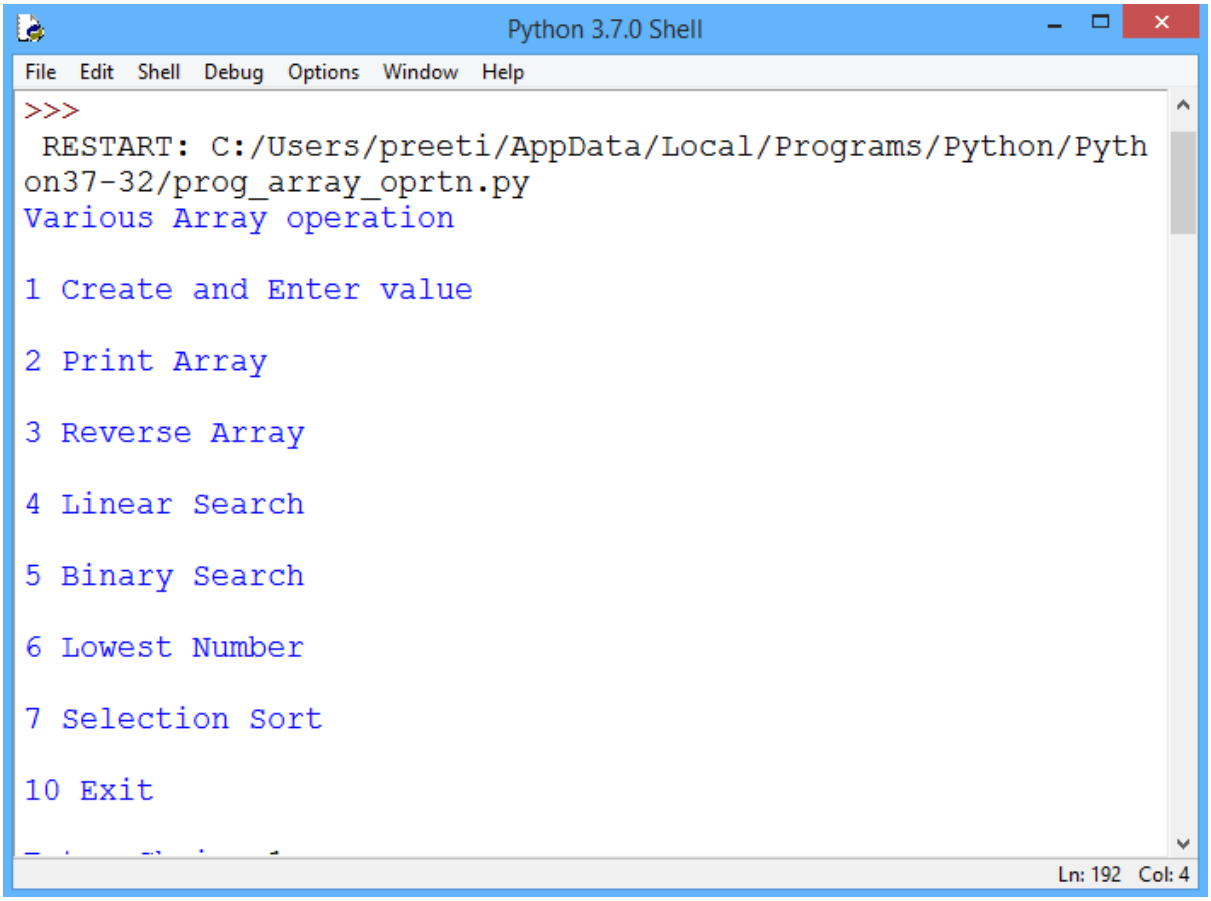
```
arr=[]

def array_operation():

    ch=1

    while ch!=10:

        print('Various Array operation\n')

        print('1 Create and Enter value\n')

        print('2 Print Array\n')

        print('3 Reverse Array\n')
```

```
        print('4 Linear Search\n')
        print('5 Binary Search\n')
        print('6 Lowest Number \n')
        print('7 Selection Sort\n')
        print('10 Exit\n')
        ch=int(input('Enter Choice '))
        if ch==1 :
           appendarray()
        elif ch==2 :
           print_array()
        elif ch==3 :
           reverse_array()
        elif ch==4 :
           linear_search()
        elif ch==5 :
           binary_search()
        elif ch==6 :
           min_number()
        elif ch==7 :
           selection_sort()

def appendarray():
    for i in range(0,10):
        x=int(input('Enter Number : '))
        arr.insert(i,x)
```

```
#-------------------------------------------------------------------------------------------------------------------
---------------
def print_array():
   for i in range(0,10):
      print(arr[i]),
#-------------------------------------------------------------------------------------------------------------------
---------------
def reverse_array():
   for i in range(1,11):
      print(arr[-i]),
#-------------------------------------------------------------------------------------------------------------------
---------------
def lsearch():
   try:
      x=int(input('Enter the Number You want to search : '))
      n=arr.index(x)
      print ('Number Found at %d location'% (i+1))
   except:
      print('Number Not Exist in list')
#-------------------------------------------------------------------------------------------------------------------
---------------
def linear_search():
   x=int(input('Enter the Number you want to search : '))
   fl=0
   for i in range(0,10):
      if arr[i]==x :
         fl=1
```

```
            print ('Number Found at %d location'% (i+1))
            break
    if fl==0 :
        print ('Number Not Found')
#-------------------------------------------------------------------------------------------------------------------
def binary_search():
    x=int(input('Enter the Number you want to search : '))
    fl=0
    low=0
    heigh=len(arr)
    while low<=heigh :
        mid=int((low+heigh)/2)
        if arr[mid]==x :
            fl=1
            print ('Number Found at %d location'% (mid+1))
            break
        elif arr[mid]>x :
            low=mid+1
        else :
            heigh=mid-1

    if fl==0 :
        print ('Number Not Found')
#-------------------------------------------------------------------------------------------------------------------
def min_number():
```

```
    n=arr[0]
    k=0
    for i in range(0,10):
        if arr[i]<n :
            n=arr[i]
            k=i
    print('The Lowest number is %d '%(n))


#-------------------------------------------------------------------------------------------------------------------
---------------
def selection_sort():
    for i in range(0,10):
        n=arr[i]
        k=i
        for j in range(i+1,10):
            if arr[j]<n :
                n=arr[j]
                k=j
        arr[k]=arr[i]
        arr[i]=n
array_operation()
```

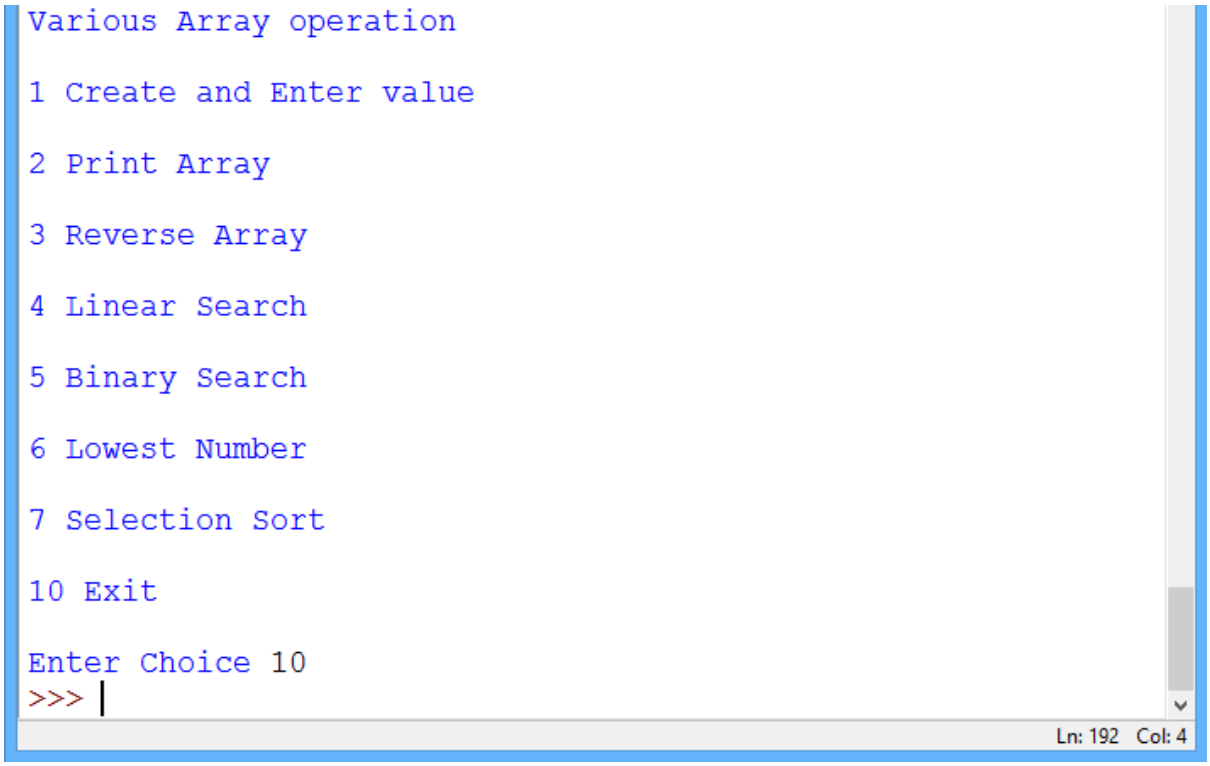



```
Enter Choice 1
Enter Number : 50
Enter Number : 20
Enter Number : 10
Enter Number : 22
Enter Number : 55
Enter Number : 33
Enter Number : 67
Enter Number : 56
Enter Number : 78
Enter Number : 90
Various Array operation

1 Create and Enter value

2 Print Array

3 Reverse Array

4 Linear Search

5 Binary Search

6 Lowest Number

7 Selection Sort

10 Exit

Enter Choice 2
```

```
Enter Choice 2
50
20
10
22
55
33
67
56
78
90
Enter Choice 3
90
78
56
67
33
55
22
10
20
50
Various Array operation

1 Create and Enter value

2 Print Array

3 Reverse Array

4 Linear Search

5 Binary Search

6 Lowest Number

7 Selection Sort

10 Exit

Enter Choice 4
Enter the Number you want to search : 56
Number Found at 8 location
```

```
Various Array operation

1 Create and Enter value

2 Print Array

3 Reverse Array

4 Linear Search

5 Binary Search

6 Lowest Number

7 Selection Sort

10 Exit

Enter Choice 5
Enter the Number you want to search : 50
Number Found at 1 location
```

```
Various Array operation

1 Create and Enter value

2 Print Array

3 Reverse Array

4 Linear Search

5 Binary Search

6 Lowest Number

7 Selection Sort

10 Exit

Enter Choice 6
The Lowest number is 10
```

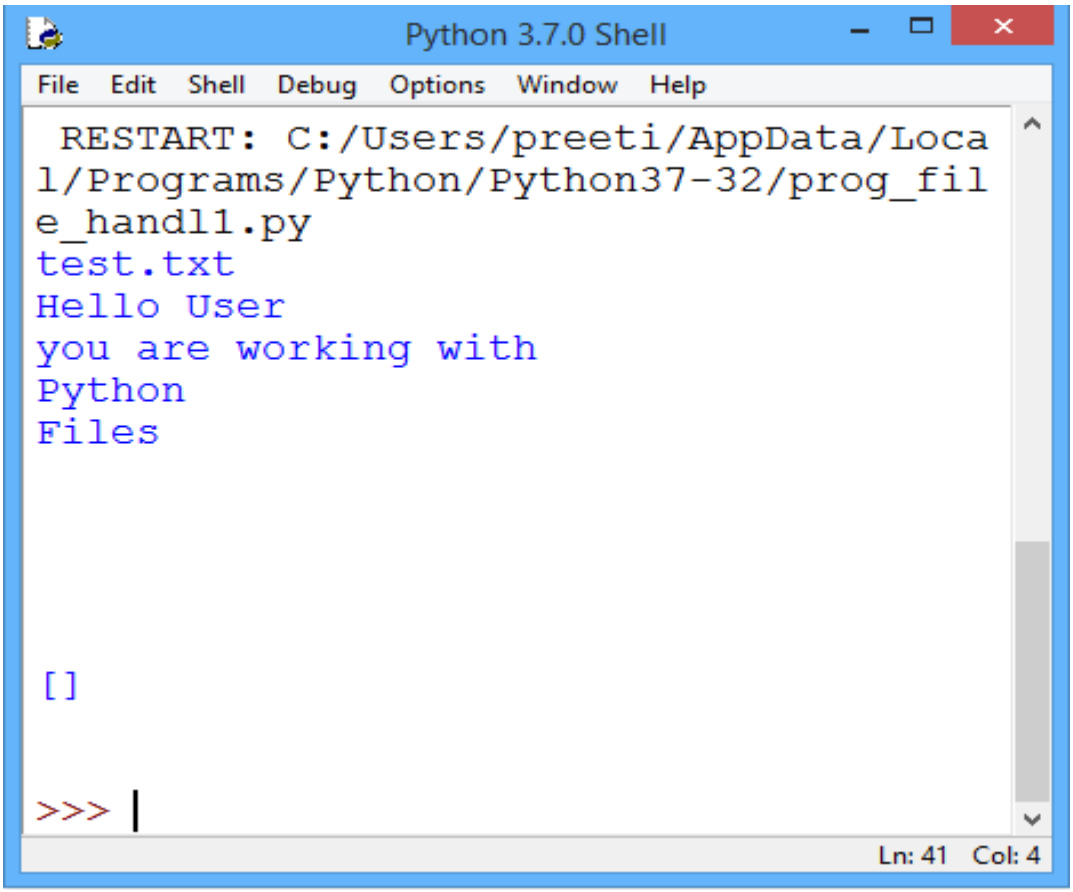


Program 12: Write a Program to read data from data file and show Data File Handling related functions utility in python.

Solution:

```
f=open("test.txt",'r')
print(f.name)
f_contents=f.read()
print(f_contents)
f_contents=f.readlines()
print(f_contents)
f_contents=f.readline()
print(f_contents)
for line in f:
    print(line, end='')
f_contents=f.read(50)
print(f_contents)
```

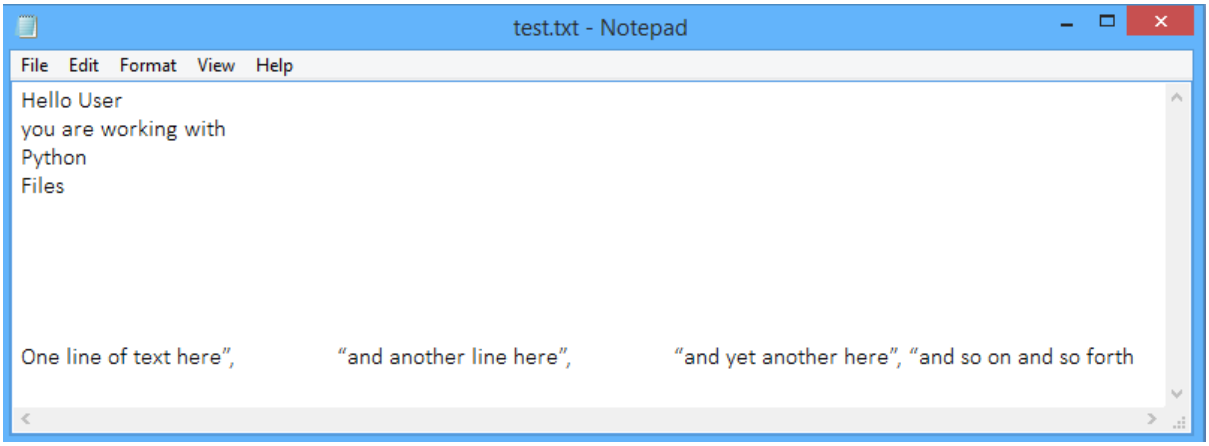
```
size_to_read=10
f_contents=f.read(size_to_read)
while len(f_contents)>0:
    print(f_contents)
    print(f.tell())
    f_contents=f.read(size_to_read)
```



Program 13: Write a Program to read data from data file in append mode and use writeLines function utility in python.

Solution:

```
#Program to read data from data file in append mode
af=open("test.txt",'a')
lines_of_text = ("One line of text here”,\
        “and another line here”,\
        “and yet another here”, “and so on and so forth")
af.writelines('\n' + lines_of_text)
af.close()
```

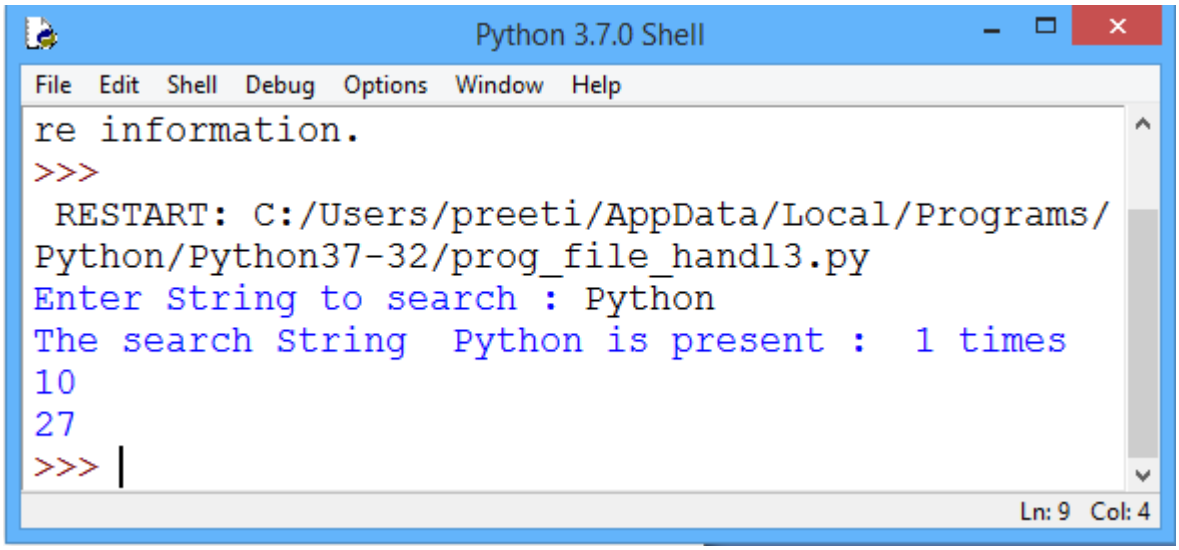


Program 14: Write a Program to read data from data file in read mode and count the particular word occurrences in given string, number of times in python.

Solution:

```
#Program to read data from data file in read mode and
#count the particular word occurrences in given string,
#number of times in python.
f=open("test.txt",'r')
read=f.readlines()
f.close()
times=0 #the variable has been created to show the number of times the loop runs
times2=0 #the variable has been created to show the number of times the loop runs
chk=input("Enter String to search : ")
```

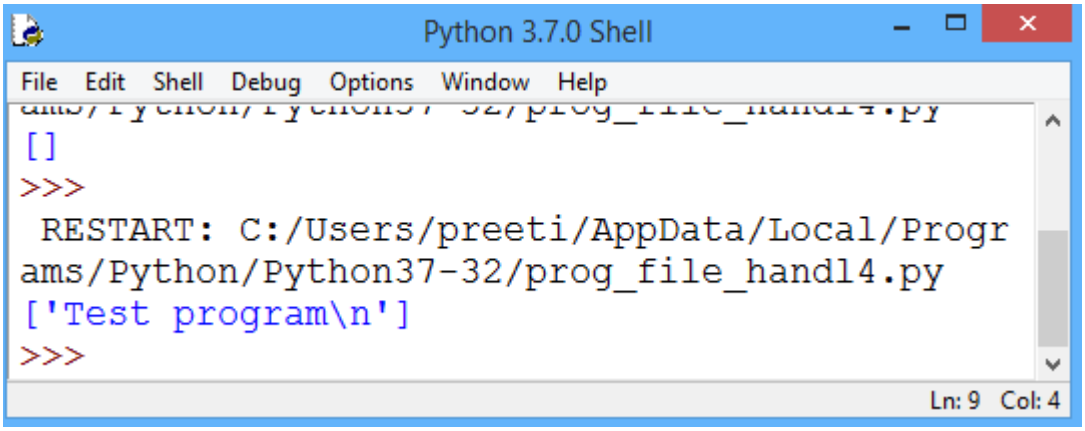
```
count=0
for sentence in read:
    line=sentence.split()
    times+=1
    for each in line:
        line2=each
        times2+=1
        if chk==line2:
            count+=1
print("The search String ", chk, "is present : ", count, "times")
print(times)
print(times2)
```

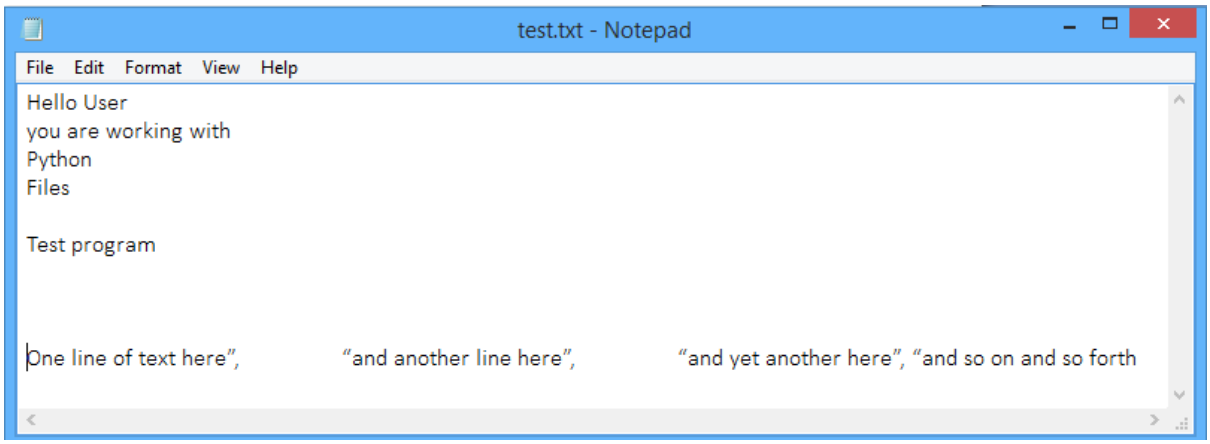


Program 15: Write a Program to read data from data file in read mode and append the words starting with letter 'T' in a given file in python.

Solution:

```
#Program to read data from data file in read mode and

#append the words starting with letter 'T'

#in a given file in python

f=open("test.txt",'r')

read=f.readlines()

f.close()

id=[]

for ln in read:

   if ln.startswith("T"):

      id.append(ln)

print(id)
```

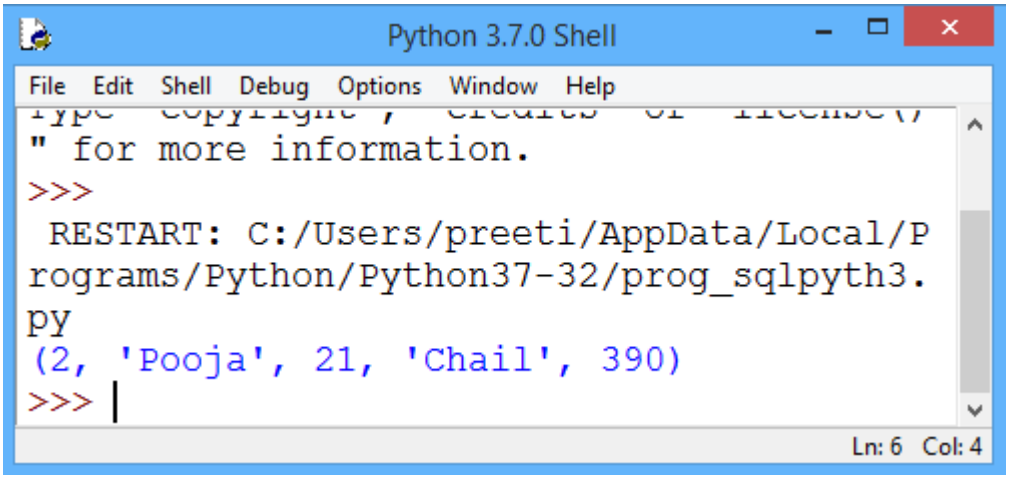




Program 16: Write a Program to show MySQL database connectivity in python.

Solution:

```
import mysql.connector

con=mysql.connector.connect(host='localhost',user='root',password='',db='school')

stmt=con.cursor()

query='select * from student;'

stmt.execute(query)

data=stmt.fetchone()

print(data)
```

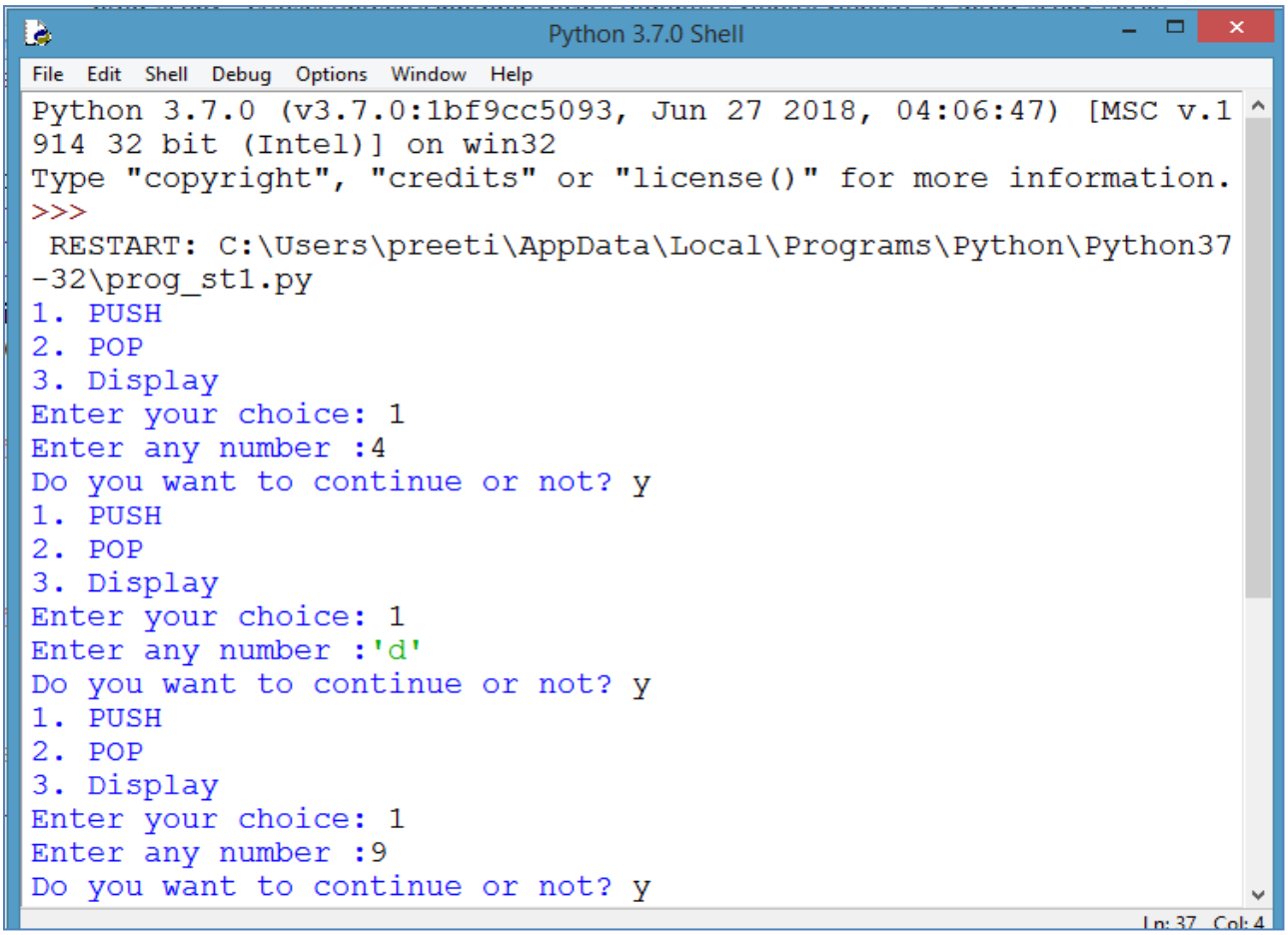


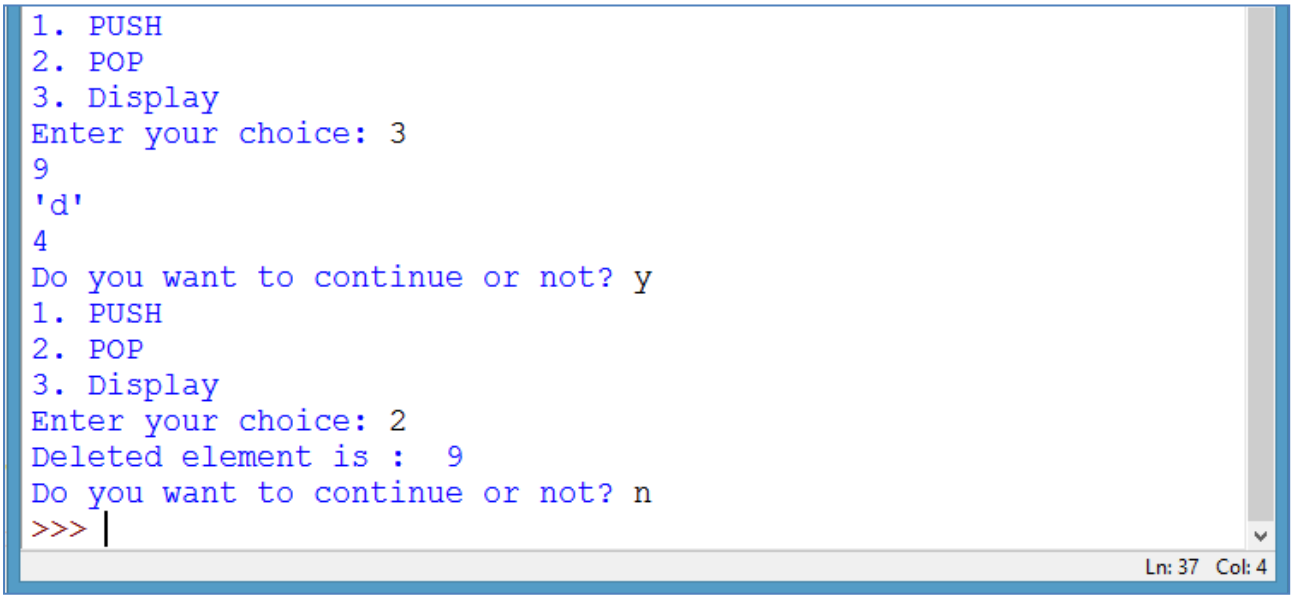
Program 17: Write a Python program to implement all basic operations of a stack, such as adding element (PUSH operation), removing element (POP operation) and displaying the stack elements (Traversal operation) using lists.

Solution:

```
#Implementation of List as stack

s=[]

c="y"

while (c=="y"):

    print ("1. PUSH")
```

```
print ("2. POP ")
print ("3. Display")
choice=int(input("Enter your choice: "))
if (choice==1):
   a=input("Enter any number :")
   s.append(a)
elif (choice==2):
   if (s==[]):
      print ("Stack Empty")
   else:
      print ("Deleted element is : ",s.pop())
elif (choice==3):
   l=len(s)
   for i in range(l-1,-1,-1):  #To display elements from last element to first
      print (s[i])
else:
   print("Wrong Input")
c=input("Do you want to continue or not? ")
```

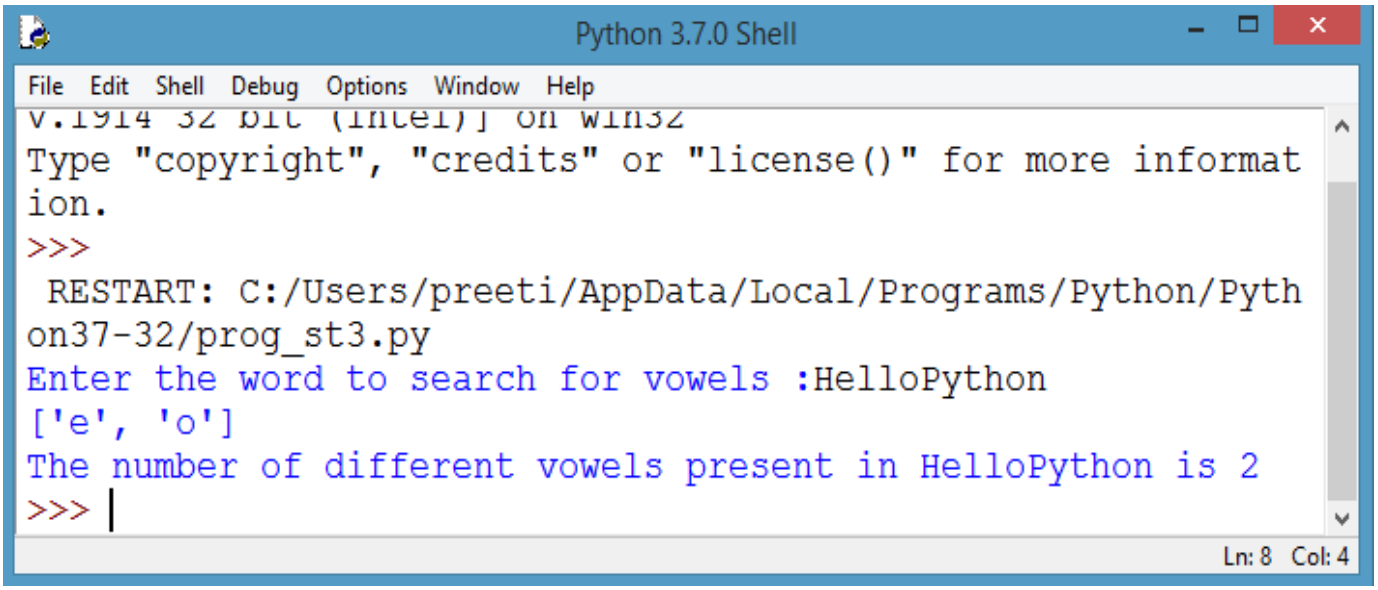

Python 3.7.0 Shell
File Edit Shell Debug Options Window Help
Python 3.7.0 (v3.7.0:1bf9cc5093, Jun 27 2018, 04:06:47) [MSC v.1
914 32 bit (Intel)] on win32
Type "copyright", "credits" or "license()" for more information.
>>>
RESTART: C:\Users\preeti\AppData\Local\Programs\Python\Python37
-32\prog_st1.py
1. PUSH
2. POP
3. Display
Enter your choice: 1
Enter any number :4
Do you want to continue or not? y
1. PUSH
2. POP
3. Display
Enter your choice: 1
Enter any number :'d'
Do you want to continue or not? y
1. PUSH
2. POP
3. Display
Enter your choice: 1
Enter any number :9
Do you want to continue or not? y
Ln: 37 Col: 4


1. PUSH
2. POP
3. Display
Enter your choice: 3
9
'd'
4
Do you want to continue or not? y
1. PUSH
2. POP
3. Display
Enter your choice: 2
Deleted element is : 9
Do you want to continue or not? n
>>>
Ln: 37 Col: 4

Program 18: Write a program to display unique vowels present in the given word using Stack.

Solution:

```
#Program to display unique vowels present in the given word
#using Stack


vowels =['a','e','i','o','u']
word = input("Enter the word to search for vowels :")
Stack = []
for letter in word:
    if letter in vowels:
        if letter not in Stack:
            Stack.append(letter)
print(Stack)
print("The number of different vowels present in",word,"is",len(Stack))
```

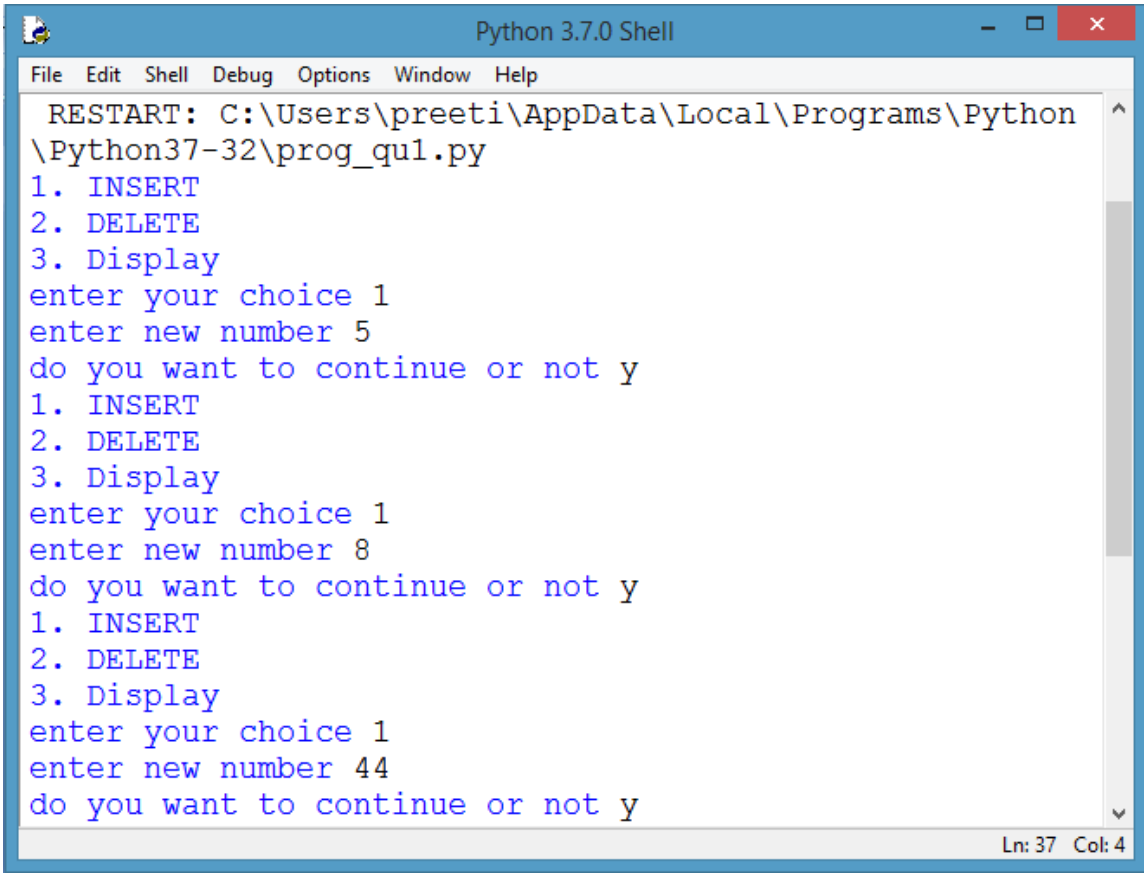


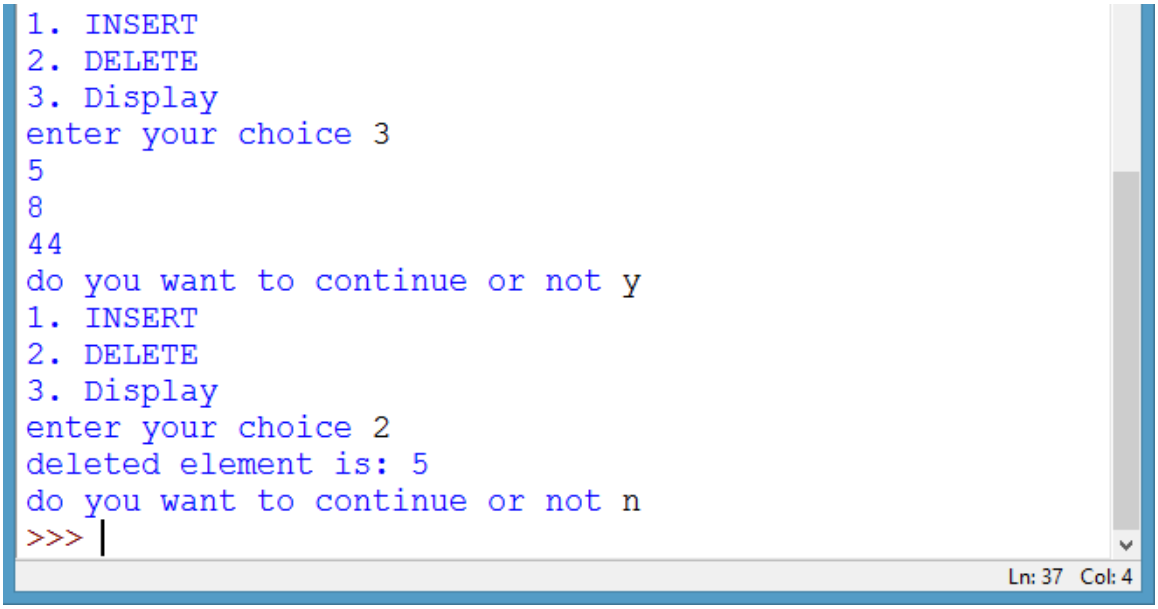
Program 19: Write a program in Python to add, delete and display elements from a queue using list.

Solution:

```
#Implementing List as a Queue - using function append() and pop()
a=[]
c='y'
while (c=='y'):
    print ("1. INSERT")
    print ("2. DELETE ")
    print ("3. Display")
    choice=int(input("Enter your choice: "))
    if (choice==1):
        b=int(input("Enter new number: "))
        a.append(b)
    elif (choice==2):
        if (a==[]):
            print("Queue Empty")
        else:
            print ("Deleted element is:",a[0])
            a.pop(0)
    elif (choice==3):
        l=len(a)
        for i in range(0,l):
            print (a[i])
    else:
        print("wrong input")
```

c=input("Do you want to continue or not: ")





Program 20: Perform all the operations with reference to table ‘Employee’ through MySQL-Python connectivity.

Solution:

```
import MySQLdb

# Using connect method to connect database

db1 = MySQLdb.connect("localhost","root","","TESTDB" )

# using cursor() method for preparing cursor

cursor = db1.cursor()

# Preparing SQL statement to create EMP table

sql = "CREATE TABLE EMP(empno integer primary key,ename  varchar(25) not null,salary float);"

cursor.execute(sql)

# disconnect from server

db1.close()
```

```
Enter password: ****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 4
Server version: 5.1.73-community MySQL Community Server (GPL)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> use testdb
Database changed
mysql> show tables;
Empty set (0.00 sec)

mysql>
```

```
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> use testdb
Database changed
mysql> show tables;
Empty set (0.00 sec)

mysql> show tables;
+------------------+
| Tables_in_testdb |
+------------------+
| emp              |
+------------------+
1 row in set (0.00 sec)

mysql>
```

Inserting a record in ‘emp’

```
import MySQLdb

db1 = MySQLdb.connect("localhost","root","","TESTDB" )

cursor = db1.cursor()

# Prepareing SQL statement to insert one record with the given values

sql = "INSERT INTO EMP VALUES (1,'ANIL KUMAR',86000);"

try:

  cursor.execute(sql)

  db1.commit()
```

except:

db1.rollback()

db1.close()

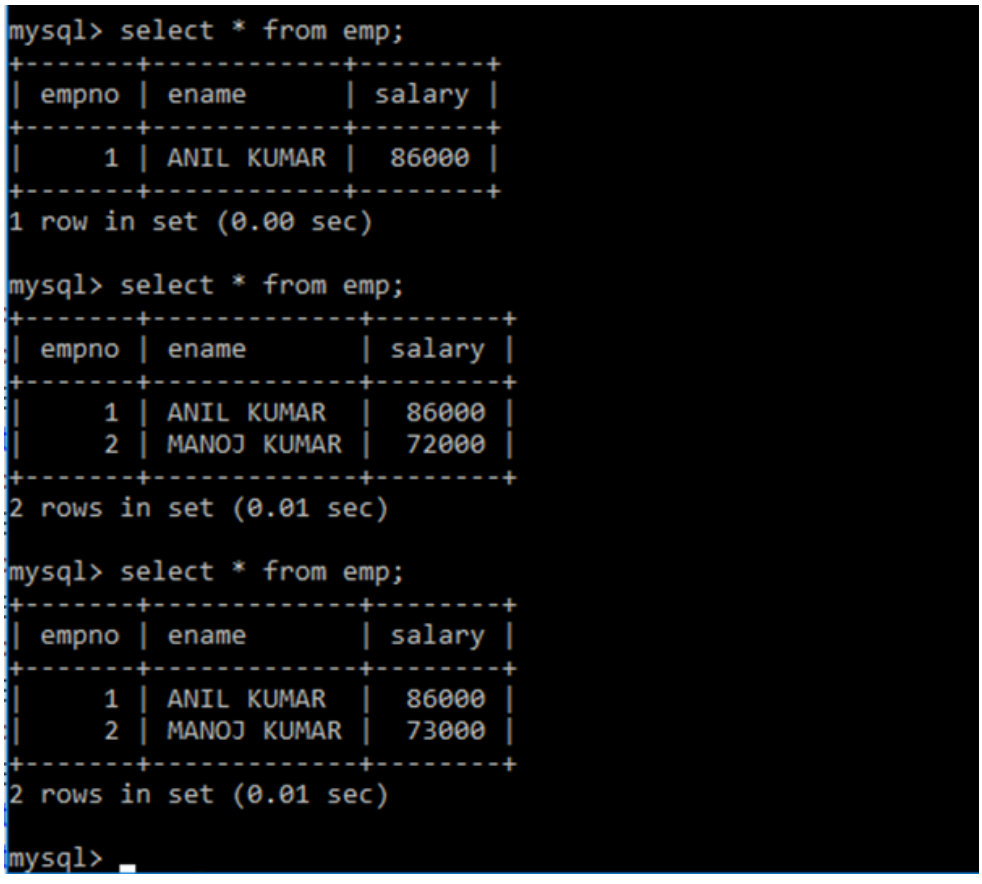
```
mysql> show tables;
+------------------+
| Tables_in_testdb |
+------------------+
| emp              |
+------------------+
1 row in set (0.00 sec)

mysql> select * from emp;
+-------+------------+--------+
| empno | ename      | salary |
+-------+------------+--------+
|     1 | ANIL KUMAR |  86000 |
+-------+------------+--------+
1 row in set (0.00 sec)

mysql>
```

Fetching all the records from EMP table having salary more than 70000.

```
import MySQLdb

db1 = MySQLdb.connect("localhost","root","","TESTDB" )

cursor = db1.cursor()

sql = "SELECT * FROM EMP WHERE SALARY > 70000;"

try:

    cursor.execute(sql)

    #using fetchall() function to fetch all records from the table EMP and store in resultset

    resultset = cursor.fetchall()

for row in resultset:


     print (row)

except:

  print ("Error: unable to fetch data")

db1.close()
```

Updating record(s) of the table using UPDATE

```
import MySQLdb

db1 = MySQLdb.connect("localhost","root","","TESTDB" )

cursor = db1.cursor()

#Preparing SQL statement to increase salary of all employees whose salary is less than 80000

sql = "UPDATE EMP SET salary = salary +1000 WHERE salary<80000;"

try:

    cursor.execute(sql)


    db1.commit()

except:


   db1.rollback()

db1.close()
```



Deleting record(s) from table using DELETE

```
import MySQLdb

db1 = MySQLdb.connect("localhost","root","","TESTDB" )

cursor = db1.cursor()

sal=int(input("Enter salary whose record to be deleted : "))

#Preparing SQL statement to delete records as per given condition

sql = "DELETE FROM EMP WHERE salary =sal”

try:

    cursor.execute(sql)

    print(cursor.rowcount, end=" record(s) deleted ")

    db1.commit()

except:

     db1.rollback()

db1.close()
```

Output:

```
>>> Enter salary whose record to be deleted: 80000

1 record(s) deleted

>>>
```

```
mysql> select * from emp;
+-------+-------------+--------+
| empno | ename       | salary |
+-------+-------------+--------+
|     1 | ANIL KUMAR  |  86000 |
|     2 | MANOJ KUMAR |  72000 |
+-------+-------------+--------+
2 rows in set (0.01 sec)

mysql> select * from emp;
+-------+-------------+--------+
| empno | ename       | salary |
+-------+-------------+--------+
|     1 | ANIL KUMAR  |  86000 |
|     2 | MANOJ KUMAR |  73000 |
+-------+-------------+--------+
2 rows in set (0.01 sec)

mysql> select * from emp;
+-------+------------+--------+
| empno | ename      | salary |
+-------+------------+--------+
|     1 | ANIL KUMAR |  86000 |
+-------+------------+--------+
1 row in set (0.00 sec)
```