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First Term

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Second Term

1. Write a program to generate the following patterns using nested loop.

(a) Pattern-1	(b) Pattern-2	(c) Pattern-3
*	1 2 3 4 5	A
**	1 2 3 4	AB
***	1 2 3	ABC
****	1 2	ABCD
*****	1	ABCDE

2. Write a program to input the value of x and n and print the sum of the following series.
   (a) 1 + X^1 + X^2 + X^3 + …..+ X^n
   (b) 1 - X^1 + X^2 - X^3 + ….. +X^n
3. Write a program to create and traverse a 2D list.
4. Write a program that displays options for inserting or deleting elements in a list. If the user chooses a deletion operation, display a submenu and ask if element is to be deleted with value or by using index position or a list slice is to be deleted.
5. Determine whether a number is a perfect number, an armstrong number or a palindrome.
6. Input a number and check if the number is a prime or composite number.
7. Display the terms of a Fibonacci series.
8. Compute the greatest common divisor and least common multiple of two integers.
9. Count and display the number of vowels, consonants, uppercase, lowercase characters in string.
10. Input a string and determine whether it is a palindrome or not; convert the case of characters in a string.
11. Find the largest/smallest number in a list/tuple
12. Input a list of numbers and swap elements at the even location with the elements at the odd location.
13. Input a list/tuple of elements, search for a given element in the list/tuple.
14. Input a list of numbers and find the smallest and largest number from the list.
15. Create a dictionary with the roll number, name and marks of n students in a class and display the names of students who have scored marks above 75.

Practical 1(a)

1. Write a program to generate the following patterns using nested loop.
   (a) Pattern-1

```
*
**
***
****
*****
```

project file t2.py - C:/Users/soham/AppData/Local/Programs/Python/Python310/project file t2.py (3.10.5)

File Edit Format Run Options Window Help

```
1 for i in range(1,6):
2     print("*"*i)
3
```

Output:

```
>>>
= RESTART: C:/Users/soham/AppData/Local/Programs/Python/Python310/project file t2.py
*
**
***
****
*****
>>>
```

Practical 1(b)

1. Write a program to generate the following patterns using nested loop.
   (b) Pattern-2
   1 2 3 4 5
   1 2 3 4
   1 2 3
   1 2
   1

File Edit Format Run Options Window Help

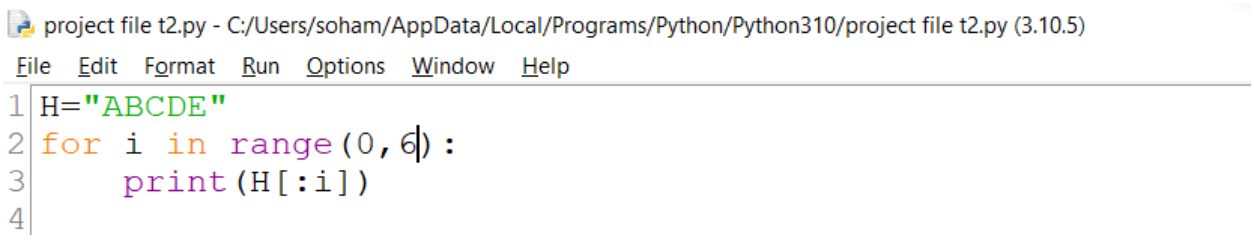
```
for a in range(6,0,-1):
    for x in range(1,a):
        print(x, end='')
    print()
```

Output

```
12345
1234
123
12
1
```

Practical 1(c)

1. Write a program to generate the following patterns using nested loop.
   (c) Pattern-3
   A
   AB
   ABC
   ABCD
   ABCDE



Output

```
= RESTART: C:/Users/soham/AppData/Local/Programs/Python/Python310/project file
2.py

A
AB
ABC
ABCD
ABCDE
>>>
```

Practical 2(a)

Write a program to input the value of x and n and print the sum of the following series.

(a) 1 + X^1 + X^2 + X^3 + …..+ X^n

file.py - C:/Users/soham/AppData/Local/Programs/Python/Python310/file.py (3.10.5)

File Edit Format Run Options Window Help

```
1 x=float(input("Enter value of x:"))
2 n=int(input("Value oh n:"))
3 s=0
4 for a in range(n+1):
5     s+=x**a
6 print("Answer:",s)
7
```

Output:

```
==== RESTART: C:/Users/soham/AppData/Local/Programs/Python/Python310/file.py ===
Enter value of x:4
Value oh n:3
Answer: 85.0
>>>
```

Practical 2(b)

Write a program to input the value of x and n and print the sum of the following series
1 - X^1 + X^2 - X^3 + ….. +X^n

File Edit Format Run Options Window Help

```
x=float(input("Enter Value of X:"))
n=int(input("Enter value of N:"))
s=1
for a in range (1,n+1):
    if a%2 == 0:
        s+=x**a
    else:
        s-=x**a
print("Answer:",s)
```

Output:

```
==== RESTART: C:/Users/soham/AppData/Local/Programs/Python/Python310/file.
Enter Value of X:3
Enter value of N:4
Answer: 61.0
>>>
```

Practical 3

Write a program to create and traverse a 2D list.

project file t2.py - C:/Users/soham/AppData/Local/Programs/Python/Python310/project file t2.py (3.10.5)

File Edit Format Run Options Window Help

```
l=[]
r=int(input("How many rows:"))
c=int(input("How many columns:"))
for i in range(r):
    ro=[]
    for j in range(c):
        e=int(input("Element"+str(i)+","+str(j)+":"))
        ro.append(e)
    l.append(ro)
print("List created:")
print("l=[")
for i in range(r):
    print("\t[",end=" ")
    for j in range(c):
        print(l[i][j],end=" ")
    print("}")
print("\t]")
```

Output:

```
= RESTART: C:/Users/soham/AppData/Loca
2.py
How many rows:2
How many columns:2
Element0,0:1
Element0,1:2
Element1,0:1
Element1,1:2
List created:
l=[
        [ 1 2 }
        [ 1 2 }
        ]
>>>
```

Practical 4

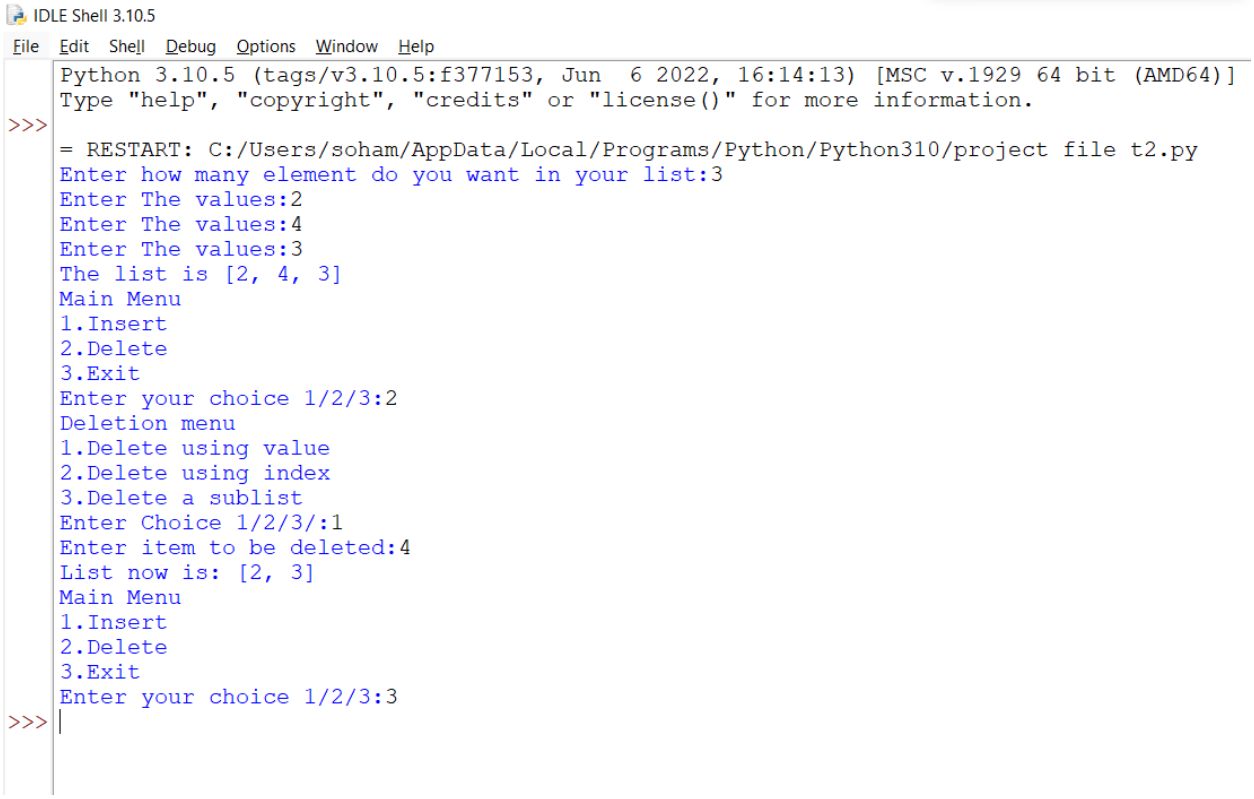
Write a program that displays options for inserting or deleting elements in a list. If the user chooses a deletion operation, display a submenu and ask if element is to be deleted with value or by using index position or a list slice is to be deleted.

project file t2.py - C:/Users/soham/AppData/Local/Programs/Python/Python310/project file t2.py (3.10.5)

File Edit Format Run Options Window Help

```
a=int(input("Enter how many element do you want in your list:"))
l=[]
for i in range(a):
    b=int(input("Enter The values:"))
    l.append(b)
print("The list is",l)
while True:
    print("Main Menu")
    print("1.Insert")
    print("2.Delete")
    print("3.Exit")
    ch=int(input("Enter your choice 1/2/3:"))
    if ch==1:
        item=int(input("Enter item:"))
        pos=int(input("Insert at which position:"))
        i=pos-1
        l.insert(i,item)
        print("Sucess!List is now:",l)
    elif ch==2:
        print("Deletion menu")
        print("1.Delete using value")
        print("2.Delete using index")
        print("3.Delete a sublist")
        dch=int(input("Enter Choice 1/2/3/:"))
        if dch==1:
            item=int(input("Enter item to be deleted:"))
            l.remove(item)
            print("List now is:",l)
        elif dch==2:
            index=int(input("Enter index of the item to be deleted:"))
            val.pop(index)
            print("List is now:",l)
        elif dch==3:
            g=int(input("Enter Lower limit to be sliced:"))
            u=int(input("Enter upper limit to be sliced:"))
            del l[g:u]
        else:
            print("Valid choices are 1/2/3:")
    elif ch==3:
        break
    else:
        print("Valid choices are 1/2/3")
```

Output Practical(4):



Practical 5

Determine whether a number is a perfect number, an armstrong number or a palindrome

file.py - C:/Users/soham/AppData/Local/Programs/Python/Python310/file.py (3.10.5)

File Edit Format Run Options Window Help

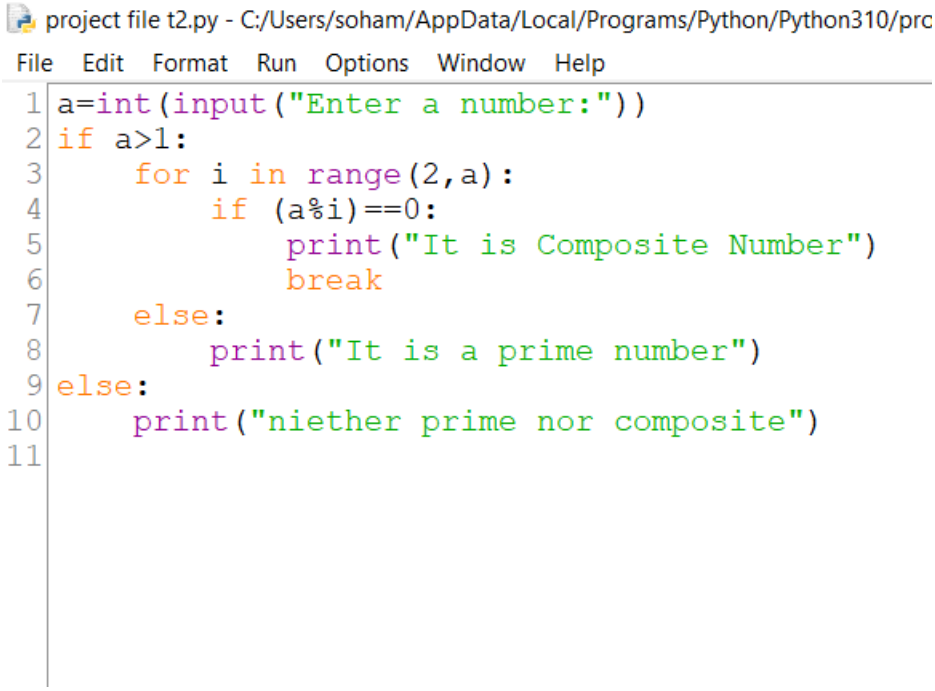
```
num = int(input("Enter a number: "))
sum = 0
temp = num
while temp > 0:
    digit = temp % 10
    sum += digit ** 3
    temp //= 10
if num == sum:
    print(num,"is an Armstrong number")
else:
    print(num,"is not an Armstrong number")
```

Output:

```
>>>
==== RESTART: C:/Users/soham/AppData/Local/Programs/Python/Python310/file.py ===
Enter a number: 9474
9474 is not an Armstrong number
>>>
==== RESTART: C:/Users/soham/AppData/Local/Programs/Python/Python310/file.py ===
Enter a number: 371
371 is an Armstrong number
>>>
```

Practical 6

Input a number and check if the number is a prime or composite number.



Output Practical 6:

```
= RESTART: C:/Users/soham/AppData/Local/Programs/Python/Python31(
2.py
Enter a number:4
It is Composite Number
>>>
= RESTART: C:/Users/soham/AppData/Local/Programs/Python/Python31(
2.py
Enter a number:3
It is a prime number
>>>
```

Practical 7

Display the terms of a Fibonacci series

project file t2.py - C:/Users/soham/AppData/Local/Programs/Python/Python310/project file t2.py (3.10.5)

File Edit Format Run Options Window Help

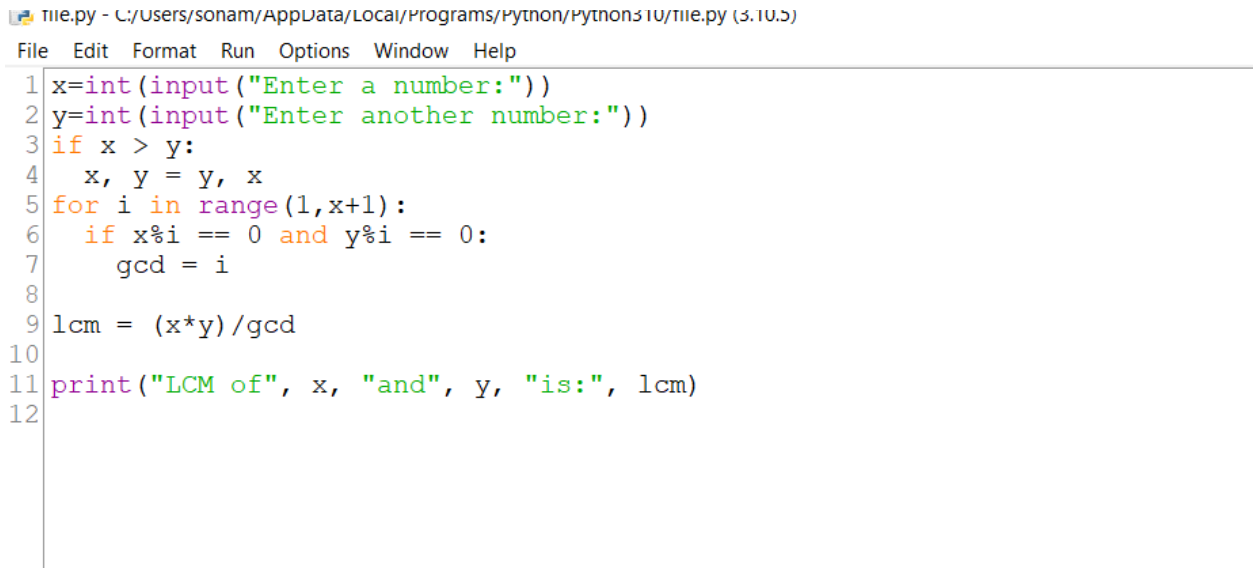
```
a=int(input("How  many terms?"))
f=0
s=1
print("\nFibanacci sries is::")
print(f,",",s,end=",")
for i in range (2,a):
    next=f+s
    print(next,end=",")
    f=s
    s=next
```

Output Practical 7

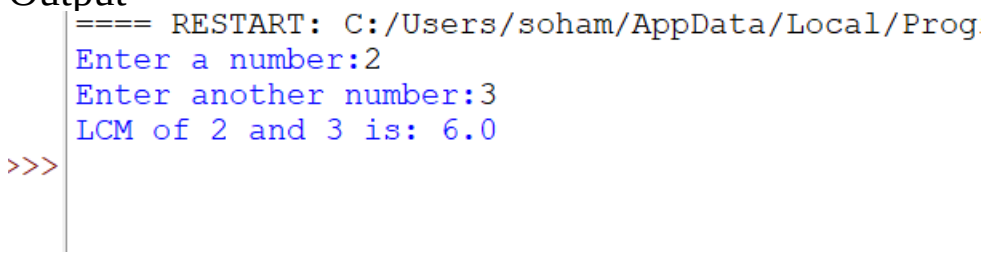
```
= RESTART: C:/Users/soham/AppData/Local/Programs/Python/Python310/project file t
2.py
How  many terms?20

Fibanacci sries is::
0 , 1,1,2,3,5,8,13,21,34,55,89,144,233,377,610,987,1597,2584,4181,
>>>
```

Practical 8

Compute the greatest common divisor and least common multiple of two integers.



Output



Practical 9

Count and display the number of vowels, consonants, uppercase, lowercase characters in string.

file.py - C:/Users/soham/AppData/Local/Programs/Python/Python310/file.py (3.10.5)

File Edit Format Run Options Window Help

```
a=input("Enter your string")
vo=co=up=lo=0
for i in a:
    if i.isupper():
        up+=1
    elif i.islower():
        lo+=1
    if(i == 'a' or i == 'e' or i == 'i' or i == 'o' or i == 'u'or i == 'A' or i == 'E' or i == 'I' or i == 'O' or i == 'U'):
        vo+=1
    else:
        co+=1
print("This sentence has:")
print(vo," vowels")
print(co," consonants")
print(up,"Uppercase letters")
print(lo,"Lower case letters")

```

Output

```
==== RESTART: C:/Users/soham/AppData/Loca
Enter your stringHi Soham
This sentence has:
3  vowels
6  consonants
2 Uppercase letters
5 Lower case letters
>>>
```

Practical 10

Input a string and determine whether it is a palindrome or not; convert the case of characters in a string.

project file t2.py - C:/Users/soham/AppData/Local/Programs/Python/Python310/project file t2.py (3.10.5)

File Edit Format Run Options Window Help

```
1 a=input("Enter String:")
2 if (a==a[::-1]):
3     print("Its A palindrome")
4 else:
5     print("Its not a palindrome")
6
```

Output

```
= RESTART: C:/Users/soham/AppData/Local/Programs/Python/Python310/project file t
2.py
Enter String:Soham
Its not a palindrome
>>>
= RESTART: C:/Users/soham/AppData/Local/Programs/Python/Python310/project file t
2.py
Enter String:qwerewq
Its A palindrome
>>>
```

Practical 11

Find the largest/smallest number in a list/tuple

File Edit Format Run Options Window Help

```
l=[]
a=int(input("How many numbers do you want to input:"))
for i in range(a):
    b=input("Enter Number:")
    l.append(b)
print("List created is:",l)
print("Smallest number is:",min(l))
print("Greatest Number is:",max(l))

```

Output:

```
= RESTART: C:/Users/Sonam/AppData/Local/Programs/Python/Python310/project file t
2.py
How many numbers do you want to input:4
Enter Number:2
Enter Number:4
Enter Number:3
Enter Number:6
List created is: ['2', '4', '3', '6']
Smallest number is: 2
Greatest Number is: 6
>>>
```

Practical 12

Input a list of numbers and swap elements at the even location with the elements at the odd location.

```
File  Edit  Format  Run  Options  Window  Help
l=[]
a=int(input("How many numbers do you want to input:"))
for i in range(a):
    b=input("Enter Number:")
    l.append(b)
print("List created is:",l)
q=len(l)
if (q%2)!=0:
    q-=1
for i in range(0,q,2):
    l[i],l[i+1]=l[i+1],l[i]
print("List after swaping",l)

```

Output:

```
How many numbers do you want to input:5
Enter Number:2
Enter Number:5
Enter Number:6
Enter Number:4
Enter Number:7
List created is: ['2', '5', '6', '4', '7']
List after swaping ['5', '2', '4', '6', '7']
>>>
```

Practical 13

Input a list/tuple of elements, search for a given element in the list/tuple

File Edit Format Run Options Window Help

```
list=eval(input("Enter list;"))
length=len(list)
element=int(input("Enter element to be searched for:"))
for i in range(0,length):
    if element==list[i]:
        print(element,"found at index",i)
        break
else:
    print(element,"not found")
```

Output:

```
Enter list;[23,97,98,67,5,87]
Enter element to be searched for:98
98 found at index 2
```

Practical 14

Input a list of numbers and find the smallest and largest number from the list

project file t2.py - C:/Users/soham/AppData/Local/Programs/Python/Python310/project file t2.py (3.10.5)

File Edit Format Run Options Window Help

```
l=[]
a=int(input("How many numbers do you want to input:"))
for i in range(a):
    b=input("Enter Number:")
    l.append(b)
print("List created is:",l)
print("Smallest number is:",min(l))
print("Greatest Number is:",max(l))

```

Output:

```
= RESTART: C:/Users/soham/AppData/Local/Programs/Python/Python310/project file t
2.py
How many numbers do you want to input:4
Enter Number:2
Enter Number:4
Enter Number:3
Enter Number:6
List created is: ['2', '4', '3', '6']
Smallest number is: 2
Greatest Number is: 6
>>>
```

Practical 15

Create a dictionary with the roll number, name and marks of n students in a class and display the names of students who have scored marks above 75.

project file t2.py - C:/Users/soham/AppData/Local/Programs/Python/Python310/project file t2.py (3.10.5)

File Edit Format Run Options Window Help

```
a=int(input("Enter Number of students:"))
r={}
for i in range(a):
    print("Enter Details of the student no. ",i+1)
    roll=int(input("Roll No:"))
    name=input("Enter name:")
    marks=int(input("Marks:"))
    r[roll]=[name,marks]
print(r)
for stu in r:
    if r[stu][1]>75:
        print(r[stu][0])
```

Output:

IDLE Shell 3.10.5

File Edit Shell Debug Options Window Help

```
Python 3.10.5 (tags/v3.10.5:f377153, Jun  6 2022, 16:14:13) [MSC
Type "help", "copyright", "credits" or "license()" for more info
>>>
= RESTART: C:/Users/soham/AppData/Local/Programs/Python/Python31
Enter Number of students:3
Enter Details of the student no.  1
Roll No:1
Enter name:Soham
Marks:98
Enter Details of the student no.  2
Roll No:2
Enter name:Pratham
Marks:89
Enter Details of the student no.  3
Roll No:3
Enter name:Shreya
Marks:95
{1: ['Soham', 98], 2: ['Pratham', 89], 3: ['Shreya', 95]}
Soham
Pratham
Shreya
>>>
```