

Experiment 1.4.

Page No.

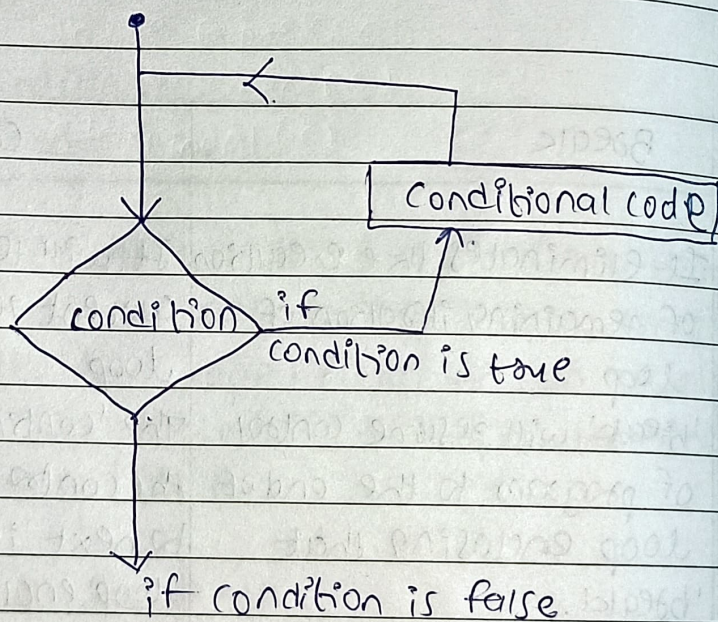
Date

Aim : To understand the looping statements.

Theory:

In general statements are executed sequentially. The first statement in a function is executed first, followed by the second and so on. There may be a situation when you need to execute a block of code several number of times.

A loop statement allows us to execute a statement or group of statements multiple times. The following diagram illustrates a loop statement -



Python, programming language provides following types of loops to handle looping requirements.

1. **while loop** - A while loop statement in Python, repeatedly executes a target statement as long as a given condition is true.

Syntax:-

```
while expression:
    Statement(s)
```

Here Statements may be single statement or a block of statements. The condition may be any expression, and true is any non-zero value. The loop iterates while the condition is true.

When the condition becomes false, program control passes to the line immediately following the loop.

2. **for loop** - It has the ability to iterate over the items of any sequence, such as a list or a string.

Syntax:

```
for iterating_var in sequence:
    Statement(s)
```

If a sequence contains an expression list, it is evaluated first. Then, the first item in the sequence is assigned to the iterating variable. Next, the statements block is executed. Each item in the list is assigned to and statement(s) block is executed until the entire sequence is exhausted.

3. nested loop- Python programming language allows to use one loop inside another loop.

Syntax.

for iterating_var in sequence:

for iterating_var in sequence

Statements(S)

Statements(S)

The Syntax for a nested while loop Statement in Python Programming language as follows-

while expression:

while expression:

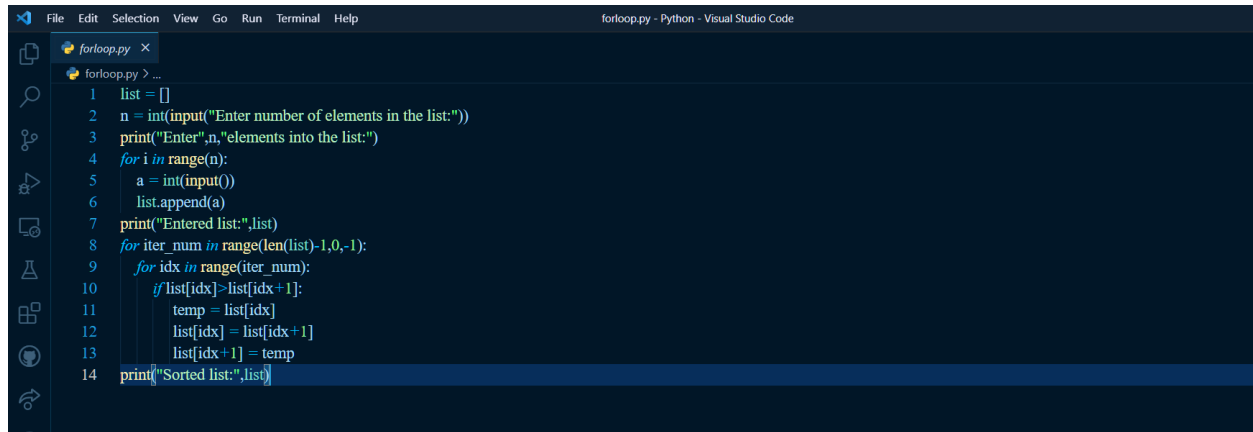
Statements(S)

Statements(S)

Programs:

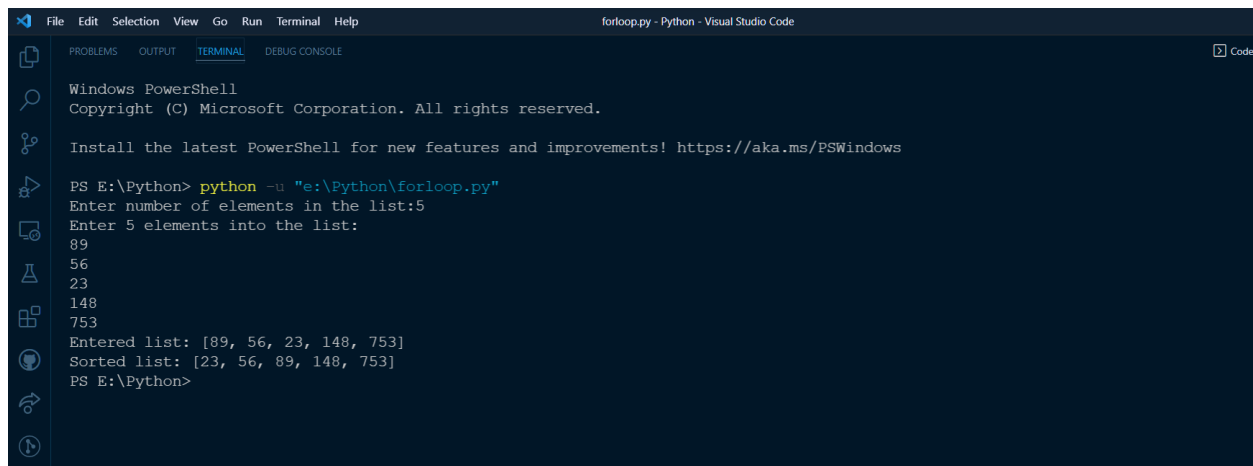
A. Write a python code for any one program using a for loop.

Code:



```
1 list = []
2 n = int(input("Enter number of elements in the list:"))
3 print("Enter",n,"elements into the list:")
4 for i in range(n):
5     a = int(input())
6     list.append(a)
7 print("Entered list:",list)
8 for iter_num in range(len(list)-1,0,-1):
9     for idx in range(iter_num):
10         if list[idx]>list[idx+1]:
11             temp = list[idx]
12             list[idx] = list[idx+1]
13             list[idx+1] = temp
14 print("Sorted list:",list)
```

Output:



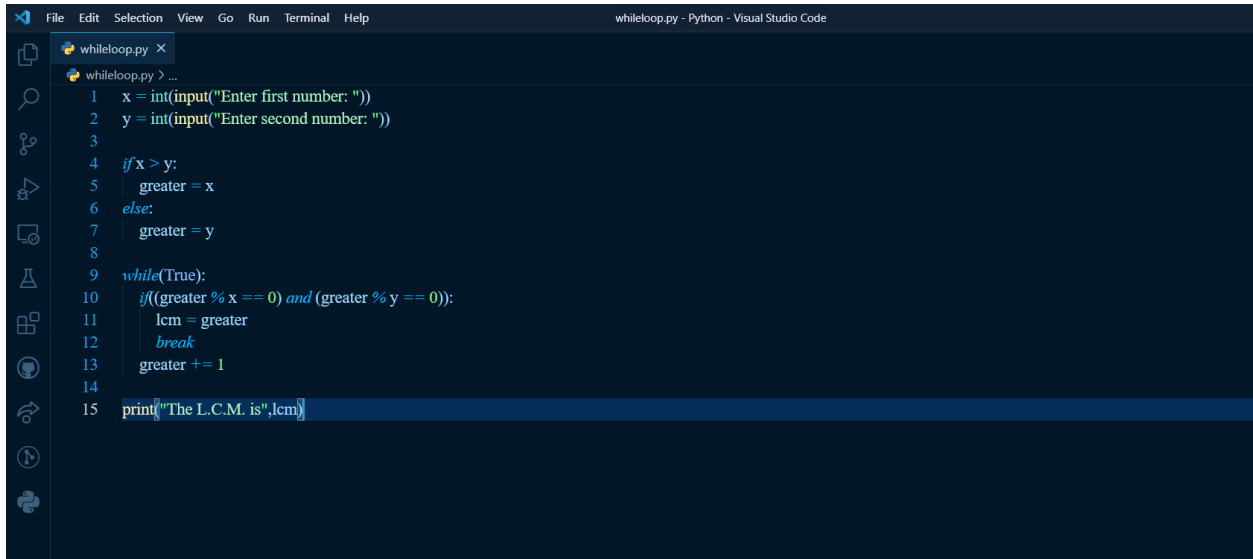
```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS E:\Python> python -u "e:\Python\forloop.py"
Enter number of elements in the list:5
Enter 5 elements into the list:
89
56
23
148
753
Entered list: [89, 56, 23, 148, 753]
Sorted list: [23, 56, 89, 148, 753]
PS E:\Python>
```

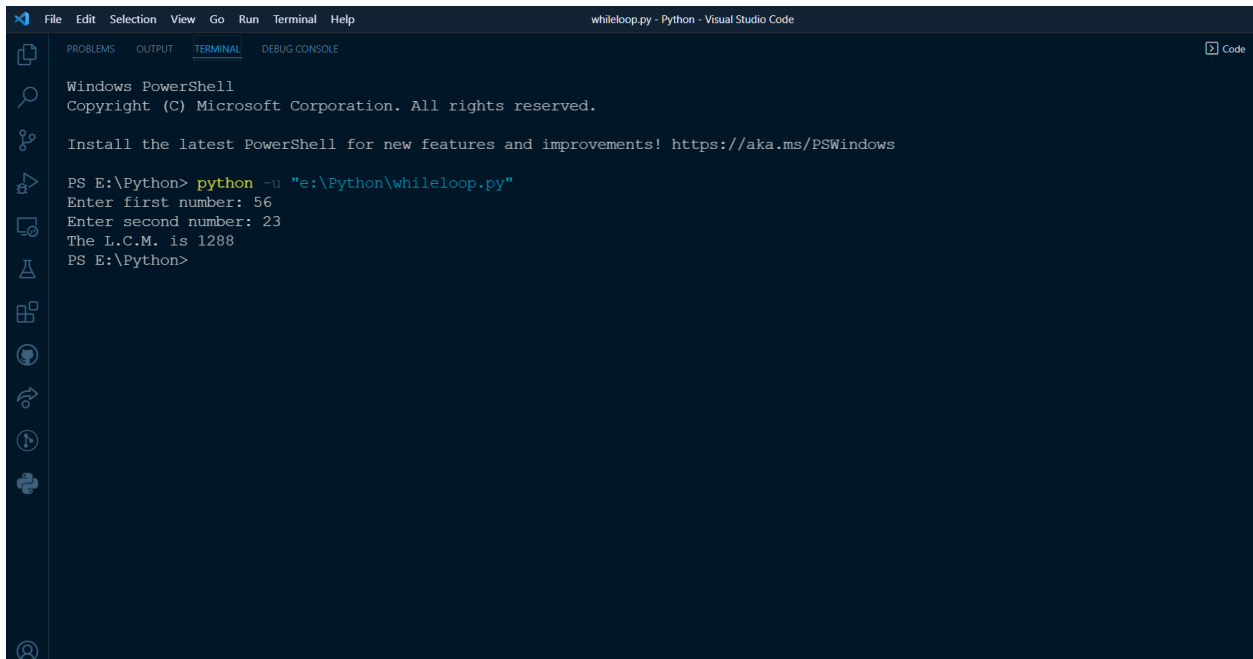
B. Write a python code for a given program using a while loop.

Code:



```
1 x = int(input("Enter first number: "))
2 y = int(input("Enter second number: "))
3
4 if x > y:
5     greater = x
6 else:
7     greater = y
8
9 while(True):
10     if((greater % x == 0) and (greater % y == 0)):
11         lcm = greater
12         break
13     greater += 1
14
15 print("The L.C.M. is",lcm)
```

Output:



```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS E:\Python> python -u "e:\Python\whileloop.py"
Enter first number: 56
Enter second number: 23
The L.C.M. is 1288
PS E:\Python>
```

Conclusion: We have studied how looping statements work and also implemented it.