



Lab-Report

Report No: 01

Course code: ICT-3208

Course title: Computer Network Lab

Report Name: Introduction to Python

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Experiment No: 01

Experiment Name: Introduction to Python

Theory:

Python is an easy to learn, powerful programming language. It has efficient high-level data structures and a simple but effective approach to object-oriented programming. Python's elegant syntax and dynamic typing, together with its interpreted nature, make it an ideal language for scripting and rapid application development in many areas on most platforms.

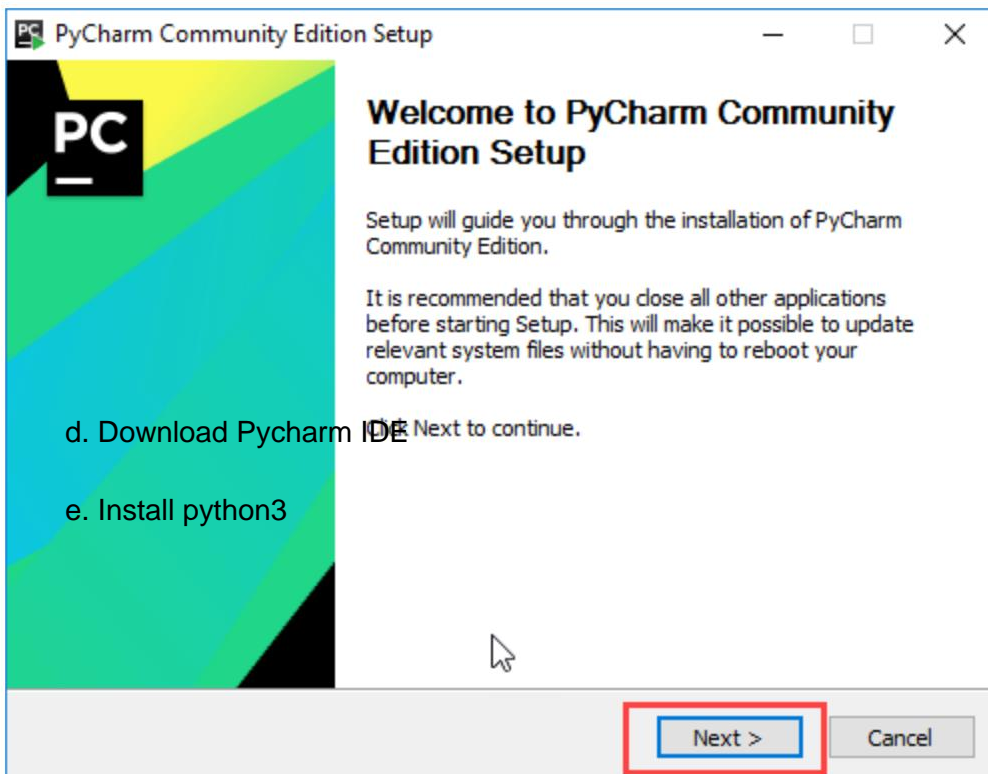
Methodology:

Setup of Python Environment:

Section 3.1: Download python3 and Pycharm IDE and install them.

STEP 1: In order to set up follow the instructions :

- a. Go to this website <https://www.python.org/downloads/>

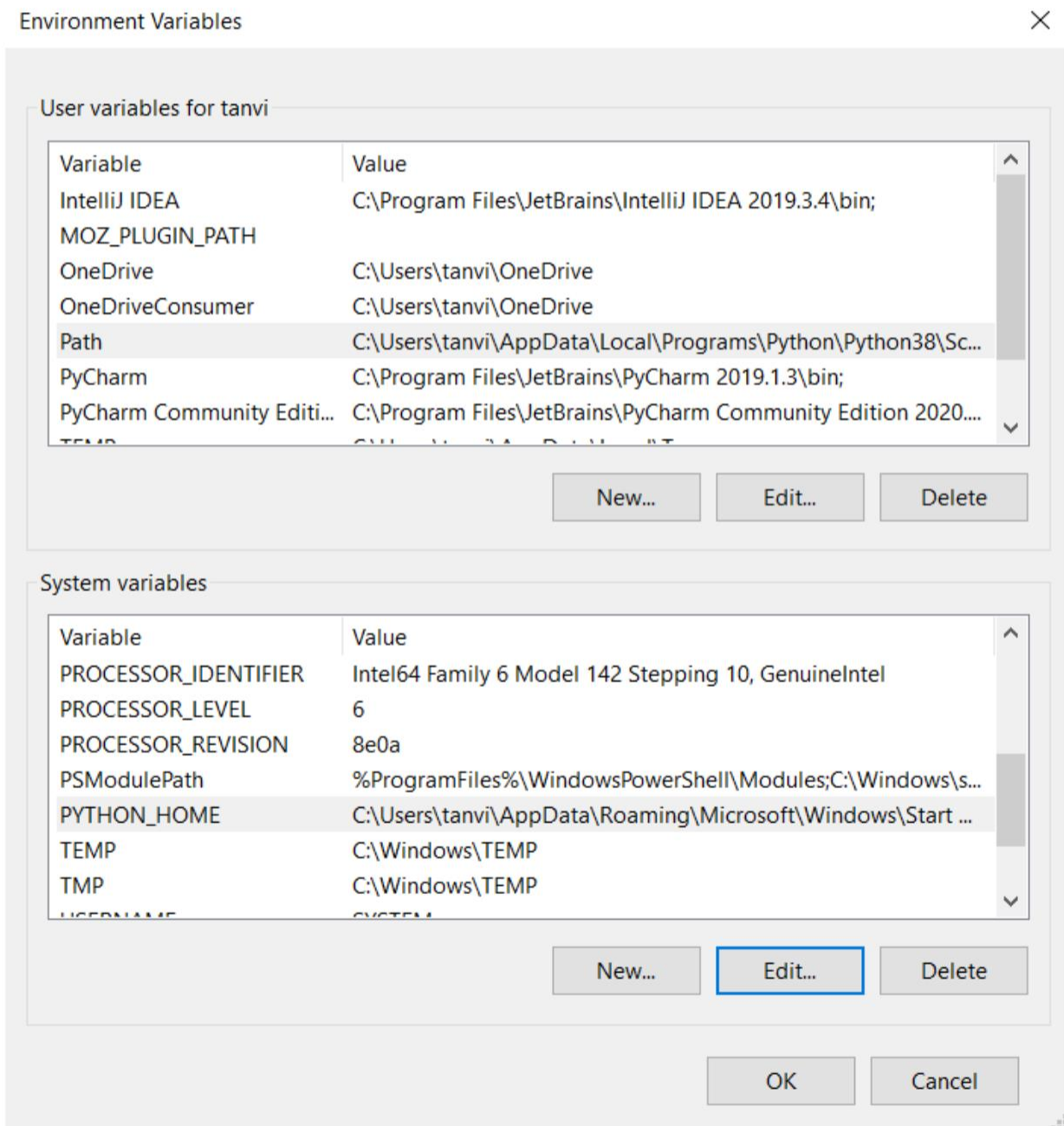


Section 3.2: Setup of Python Environment

STEP 1: Open windows environment variables settings and set the path variable of python3.

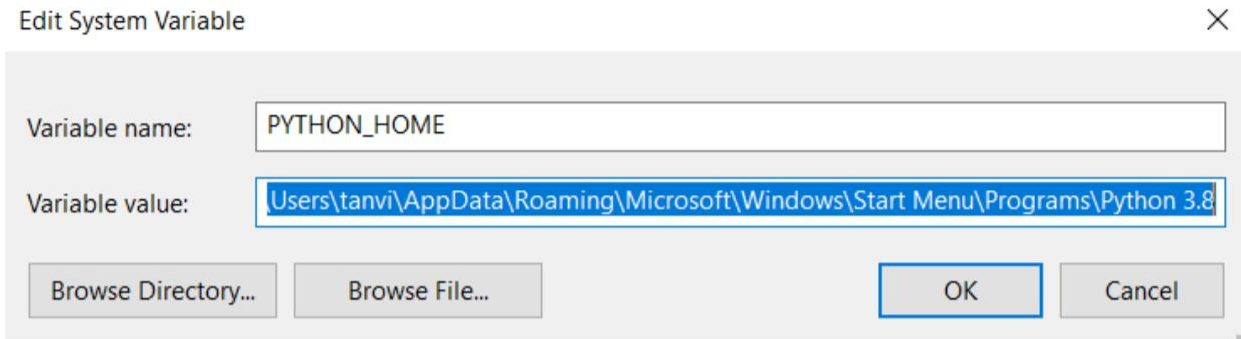
In order to set up follow the instructions :

- a. Go to **Control Panel >System and Security >System >Advanced System Settings**
- b. Open **Environment variables settings**



c. In the System Variables Section create a new variable named

PYTHON_HOME d. Set the path for PYTHON_HOME



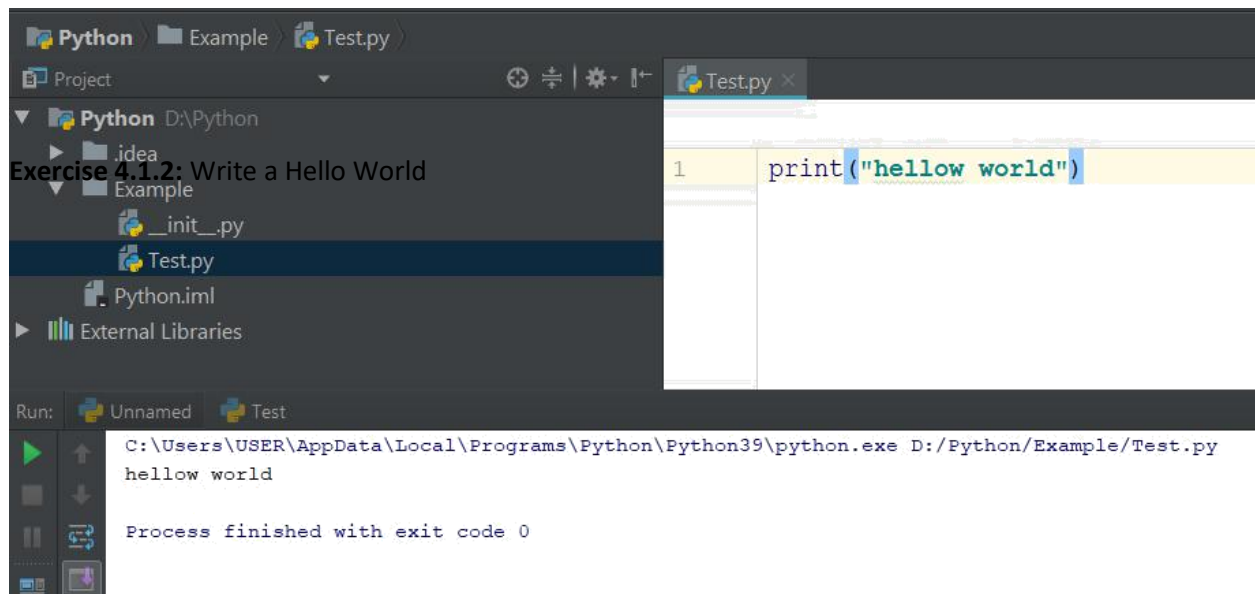
e. Save that path.

Section 3.3: *Start pycharm IDE.*

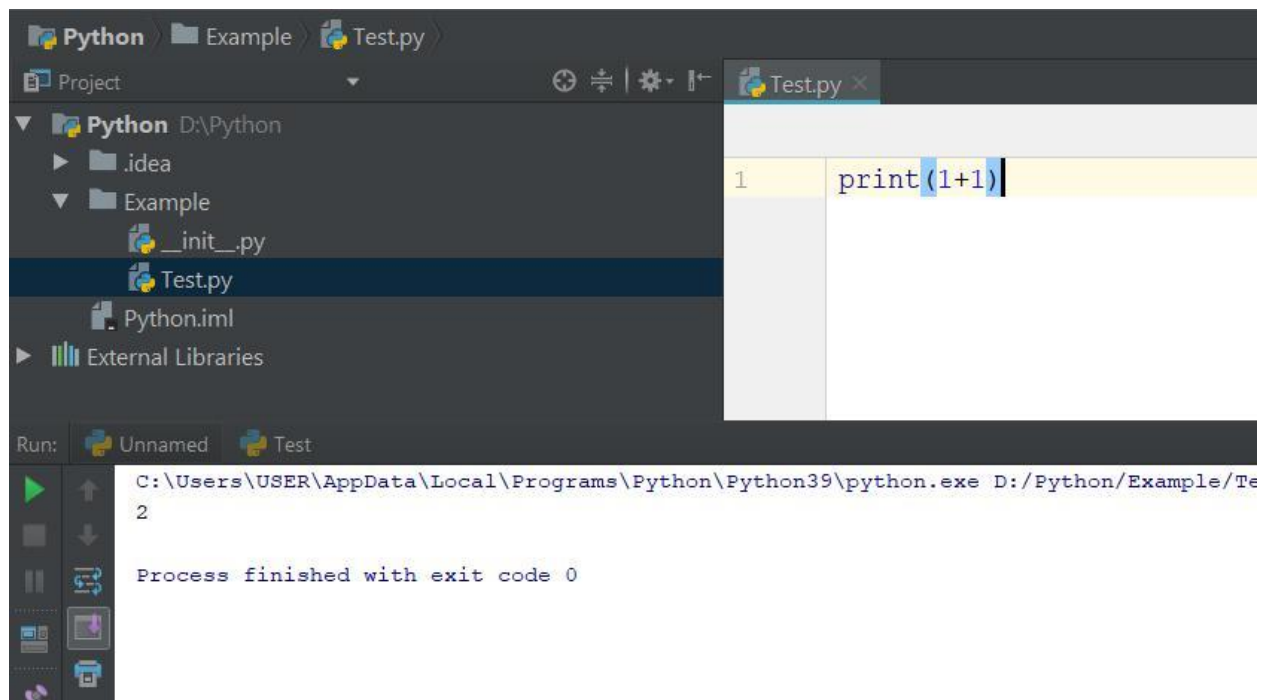
In order to start pycharm IDE follow these instructions :

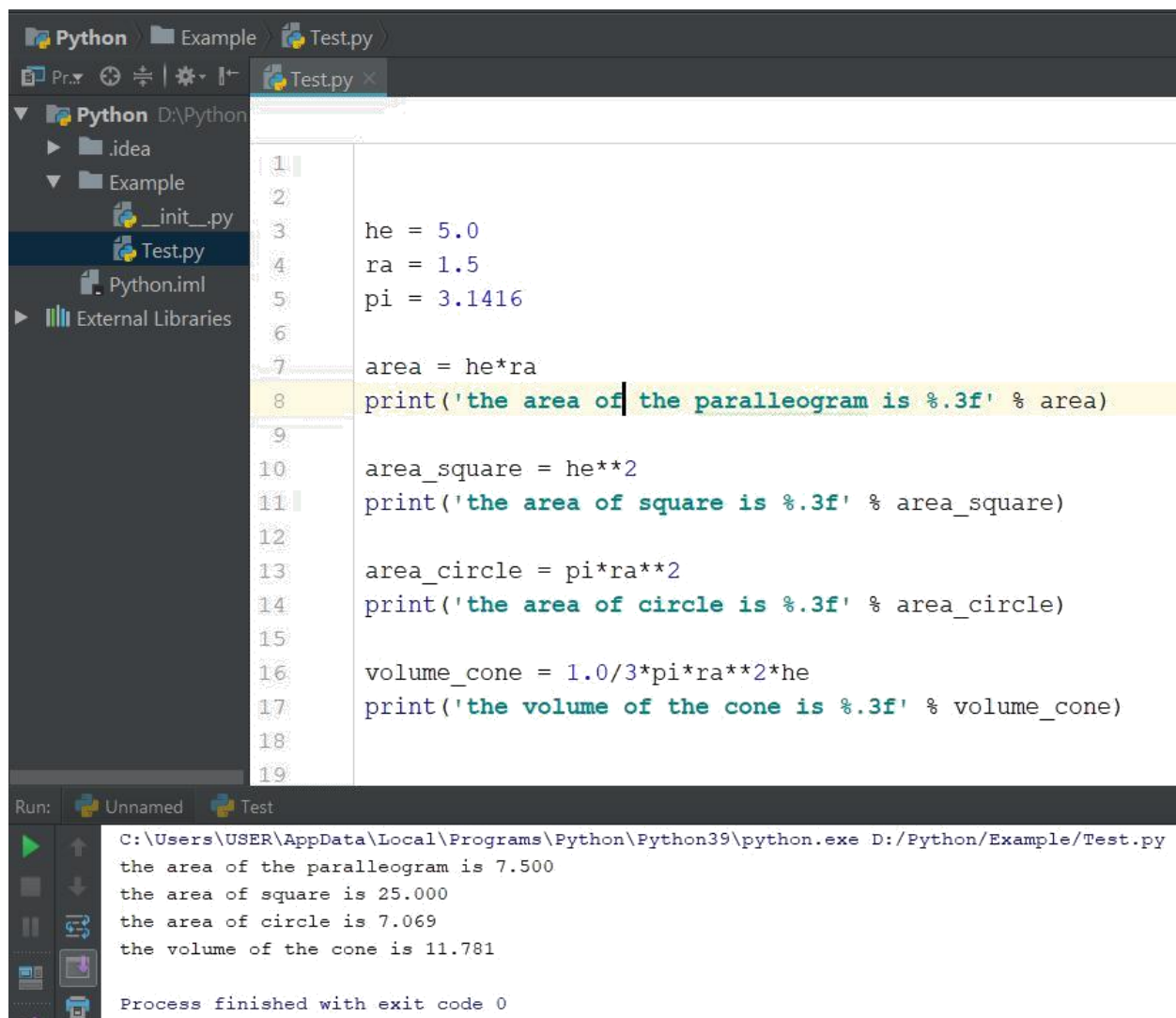
a. Go to **Start**





Exercise 4.1.3: Compute 1+1





The screenshot shows an IDE window with a Python file named `Test.py` in the `Example` directory. The script calculates the area of a parallelogram, a square, a circle, and the volume of a cone. The output of the script is displayed in the Run window at the bottom.

```
1  
2  
3 he = 5.0  
4 ra = 1.5  
5 pi = 3.1416  
6  
7 area = he*ra  
8 print('the area of the parallelogram is %.3f' % area)  
9  
10 area_square = he**2  
11 print('the area of square is %.3f' % area_square)  
12  
13 area_circle = pi*ra**2  
14 print('the area of circle is %.3f' % area_circle)  
15  
16 volume_cone = 1.0/3*pi*ra**2*he  
17 print('the volume of the cone is %.3f' % volume_cone)  
18  
19
```

Run: Unnamed Test

```
C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/Test.py  
the area of the parallelogram is 7.500  
the area of square is 25.000  
the area of circle is 7.069  
the volume of the cone is 11.781  
  
Process finished with exit code 0
```

Section 4.2.1: Create and run basic example.

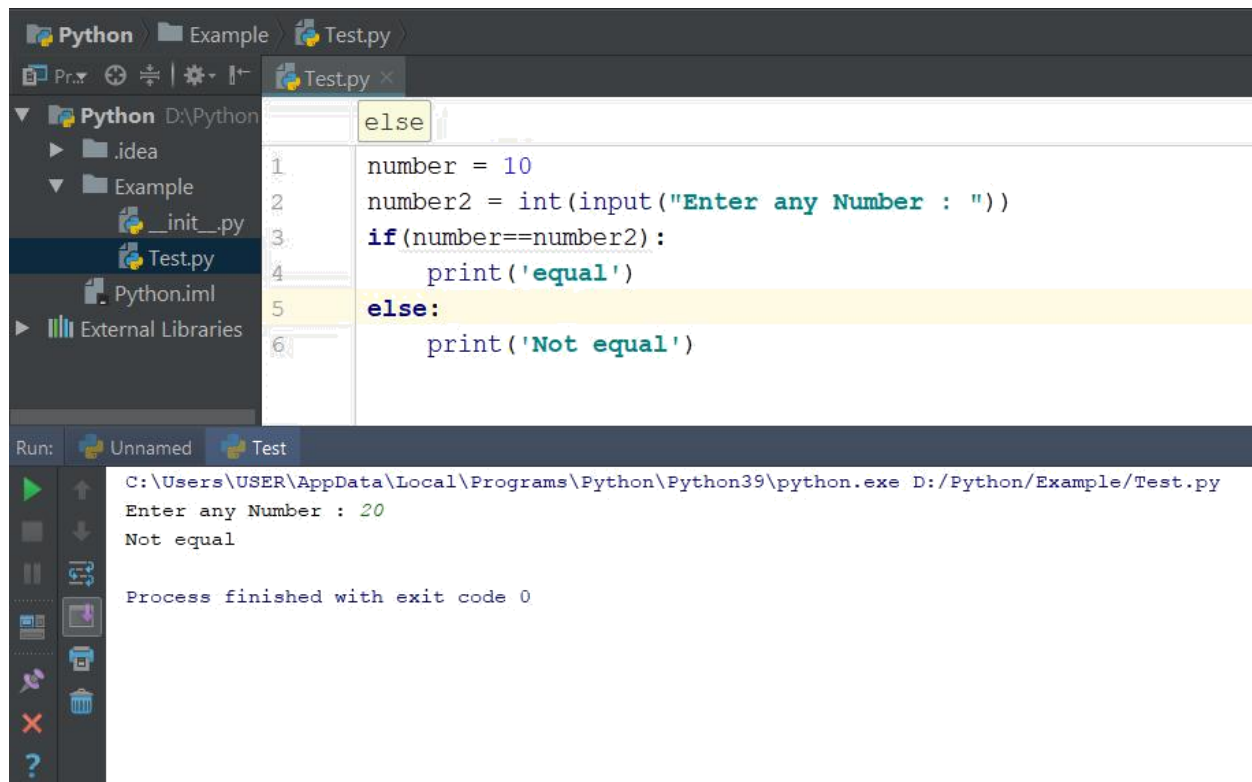
The screenshot displays a Python IDE with a file named `Test.py` in the `Example` directory. The script performs basic arithmetic operations on two input numbers, 20 and 10. The operations include addition, subtraction, multiplication, exponentiation, division, floor division, and modulo. The output of the script is shown in the Run window at the bottom.

```
1 x = int(input("Enter first number : "))
2 y = int(input("Enter second number : "))
3 plus = x + y
4 print('Sum of {0} & {1} = {2}' .format(x,y,plus))
5
6 minus = x - y
7 print('Minus of {0} & {1} = {2} ' .format(x,y,minus))
8
9 multiply = x*y
10 print('Multiply of {0} & {1} = {2}' .format(x,y,multiply))
11
12 power = x**y
13 print('Power of {0} & {1} = {2}' .format(x,y,power))
14
15 Divide = x/y
16 print('Divide of {0} & {1} = {2} ' .format(x,y,Divide))
17
18 floor = x//y
19 print('Floor of {0} & {1} = {2}' .format(x,y,floor))
20
21 modulo = x%y
22 print('Modulo of {0} & {1} = {2}' .format(x,y,modulo))
```

Run: Unnamed Test

```
C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/Test.py
Enter first number : 20
Enter second number : 10
Sum of 20 & 10 = 30
Minus of 20 & 10 = 10
Multiply of 20 & 10 = 200
Power of 20 & 10 = 102400000000000
Divide of 20 & 10 = 2.0
Floor of 20 & 10 = 2
Modulo of 20 & 10 = 0
```

Exercise 4.2.2: The if statement:



The screenshot shows an IDE with a Python project. The file explorer on the left shows the project structure: Python, .idea, Example, __init__.py, Test.py, Python.iml, and External Libraries. The main editor displays the code in Test.py:

```
1 number = 10
2 number2 = int(input("Enter any Number : "))
3 if (number==number2):
4     print('equal')
5 else:
6     print('Not equal')
```

The 'Run' tab at the bottom shows the execution output:

```
C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/Test.py
Enter any Number : 20
Not equal

Process finished with exit code 0
```

Exercise 4.2.3: The while Statement

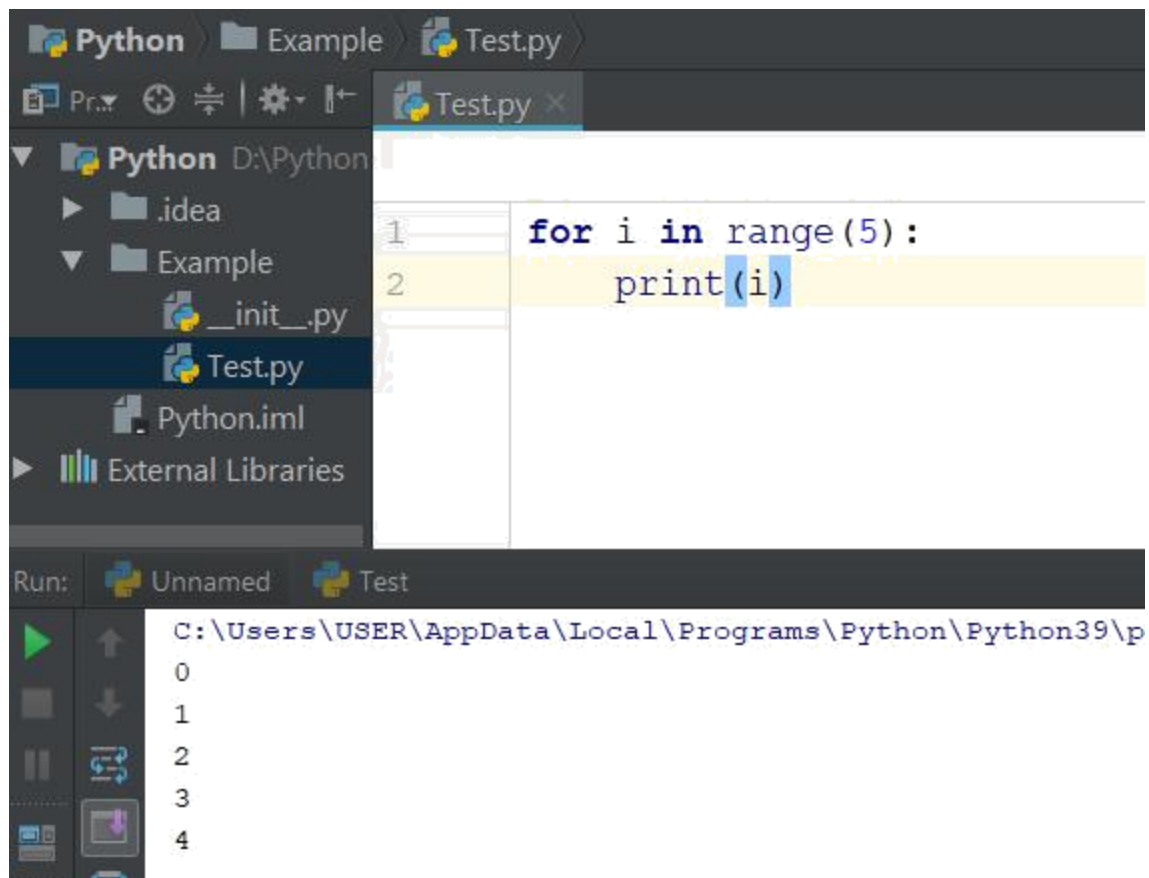
The screenshot shows an IDE with a project named 'Python' at 'D:\Python'. Inside the 'Example' folder, there is a file 'Test.py'. The code in 'Test.py' is as follows:

```
1 number = 10
2 number2 = int(input("Enter any number :"))
3
4 while (number <= number2):
5     print(number)
6     number = number + 1
```

The script is executed, and the output is shown in the 'Run' window. The command prompt shows the execution path and the input '15'. The output displays the numbers 10 through 15, each on a new line. The process finished with exit code 0.

```
C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/
Enter any number :15
10
11
12
13
14
15
Process finished with exit code 0
```

Exercise 4.2.4: The for Statement



```
Python Example Test.py
Python D:\Python
.idea
Example
__init__.py
Test.py
Python.iml
External Libraries

1 for i in range(5):
2     print(i)

Run: Unnamed Test
C:\Users\USER\AppData\Local\Programs\Python\Python39\p
0
1
2
3
4
```

Question 5.1: Explain what is eclipse? And why we use it for programing on python?

Answer:

Eclipse is an integrated development environment (IDE) used in computer programming. It contains a base workspace and an extensible plug-in system for customizing the environment. ... It was one of the first IDEs to run under GNU Classpath and it runs without problems under IcedTea.

For python development under Eclipse you can use the PuDev Plugin which is an open source project. So, we use it for programming on python.

Question 5.2: Explain three main characteristics of python that you test in the lab?

Answer:

Features in Python

There are many features in Python, some of which are discussed below –

1. Easy to code:

Python is a very developer-friendly language which means that anyone and everyone can learn to code it in a couple of hours or days. As compared to other object-oriented programming languages like Java, C, C++, and C#, Python is one of the easiest to learn.

2. Open and Free Source:

Python is an open-source programming language which means that anyone can create and contribute to its development. Python has an online forum where thousands of coders gather daily to improve this language further. Along with this python is free to download and use in any operating system, be it Windows, Mac or Linux.

Question 5.3: Which is the difference between empty module and main module when creating a python script?

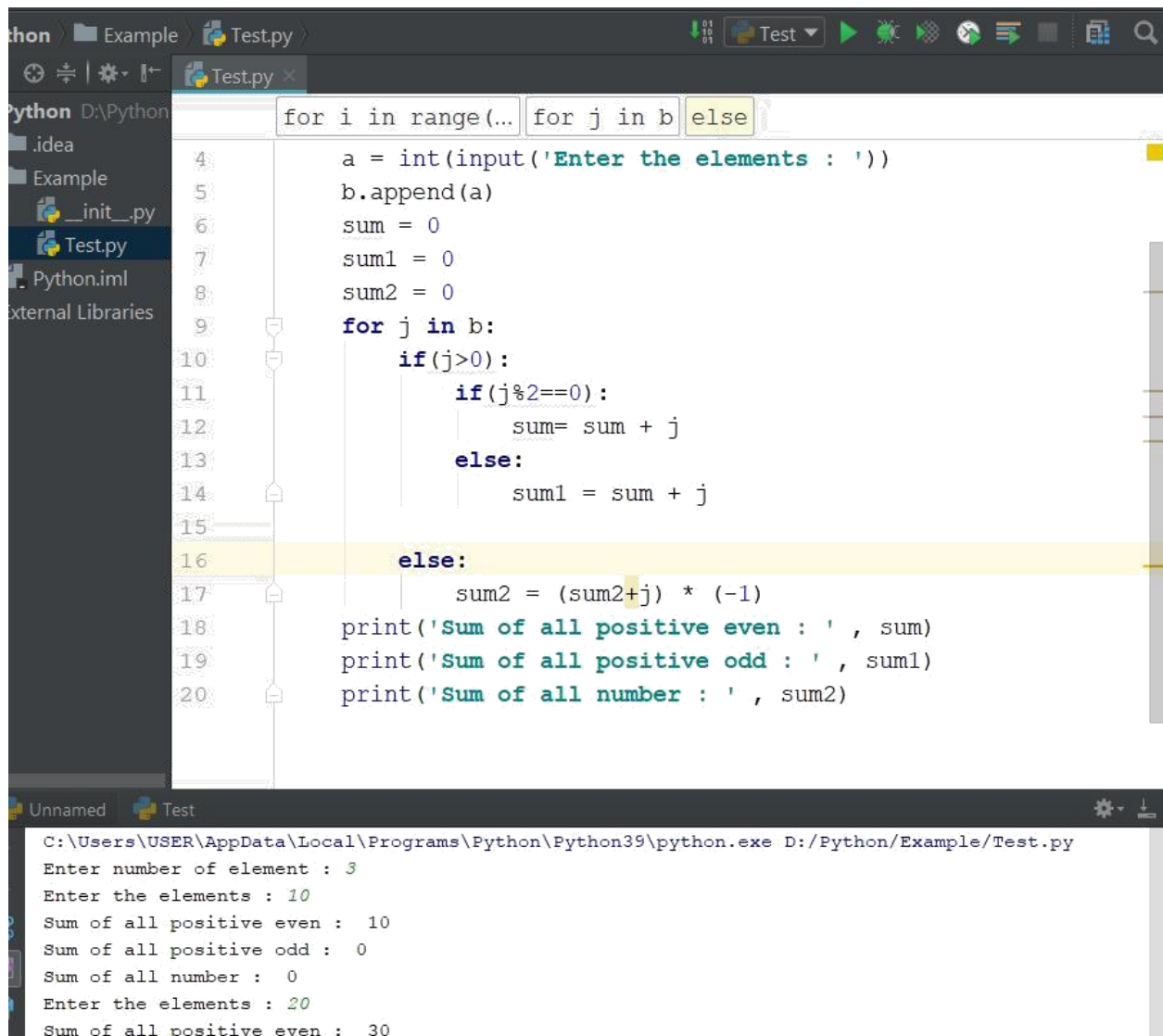
Answer:

A module is a file containing Python code. Python modules can be managed using functions, classes etc.

A module name is the file name with the .py extension. When we have a file called empty.py empty is the module name. The `__name__` is a variable that holds the name of the modules being executed called also the main module, has a special name: `'__main__'`. With this name it can be referenced from the Python code.

Question 5.5: Create a python program that combines at least 4 operators and one statement (if, while or for)

Answer:



The screenshot displays an IDE window with a Python file named 'Test.py'. The code is as follows:

```
4 a = int(input('Enter the elements : '))
5 b.append(a)
6 sum = 0
7 sum1 = 0
8 sum2 = 0
9 for j in b:
10     if(j>0):
11         if(j%2==0):
12             sum= sum + j
13         else:
14             sum1 = sum + j
15     else:
16         sum2 = (sum2+j) * (-1)
17
18 print('Sum of all positive even : ' , sum)
19 print('Sum of all positive odd : ' , sum1)
20 print('Sum of all number : ' , sum2)
```

The output window at the bottom shows the execution results:

```
C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/Test.py
Enter number of element : 3
Enter the elements : 10
Sum of all positive even : 10
Sum of all positive odd : 0
Sum of all number : 0
Enter the elements : 20
Sum of all positive even : 30
```

Discussion:

In this lab, we can learn setup the python in eclipse, and can execute a python code successfully. Python is a language that is remarkably easy to learn, and it can be used as a stepping stone into other programming languages and frameworks. If you're an absolute beginner and this is your first time working with any type of coding language.