



## Lab-Report

Report No: 01

Course code: ICT-3208

Course title: Computer Network Lab

Report Name: Introduction to Python

### Submitted by

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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 objectoriented 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:

**STEP 1:** Open Eclipse and setup a correct access to Internet (This is required only in RMIT network). In order to set up Manual Proxy follow the instructions (see also figure 1):

- a) Go to Windows > Preferences > General > Network Connections.
- b) Change Active Provider to Manual.
- c) Input proxy details, including username/password if required.  
Host: proxy.rmit.edu.au , Port: 8080 .Username/password: No required
- d) Clear SOCKS proxy.
- e) Restart Eclipse.

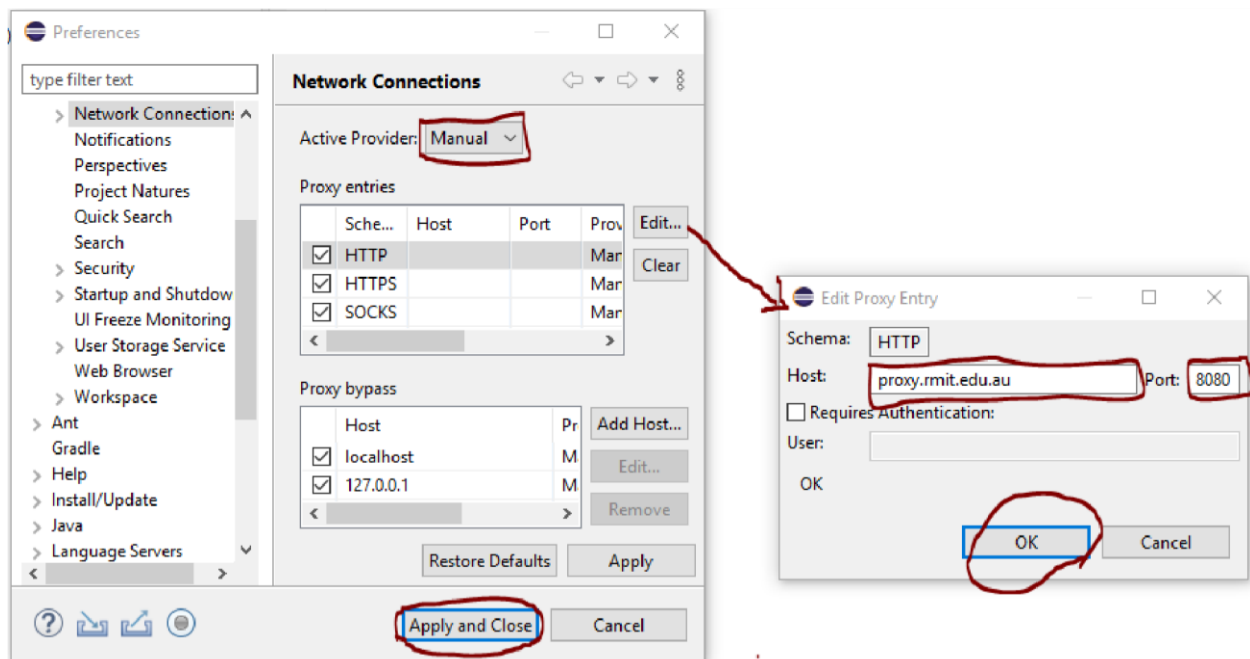


Figure 1. Eclipse setup for Internet

STEP 2: Installing python environment using Eclipse Graphical Interface1 .

a. To install PyDev and PyDev Extensions using the Eclipse Update Manager, you need to use the Help > Install New Software... menu (note that in older versions, this would be the 'Find and Install' menu) as shown in the following figure:

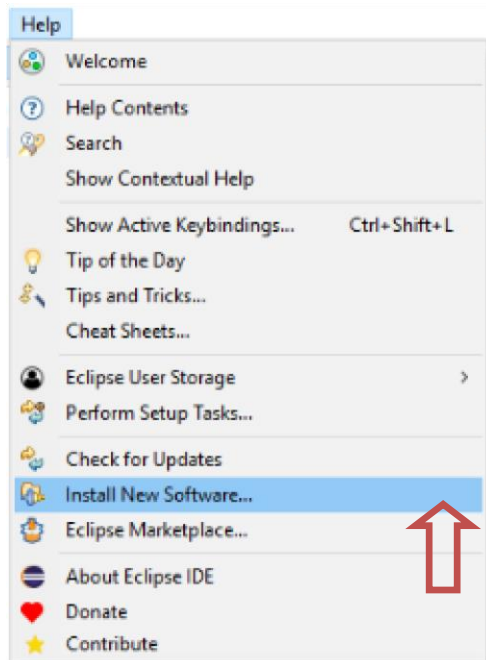


Figure 2. Step 2.

b.

In the next screen, add the update site(s) you want to work with (see the figure below). The available update sites are (see Figure 3):

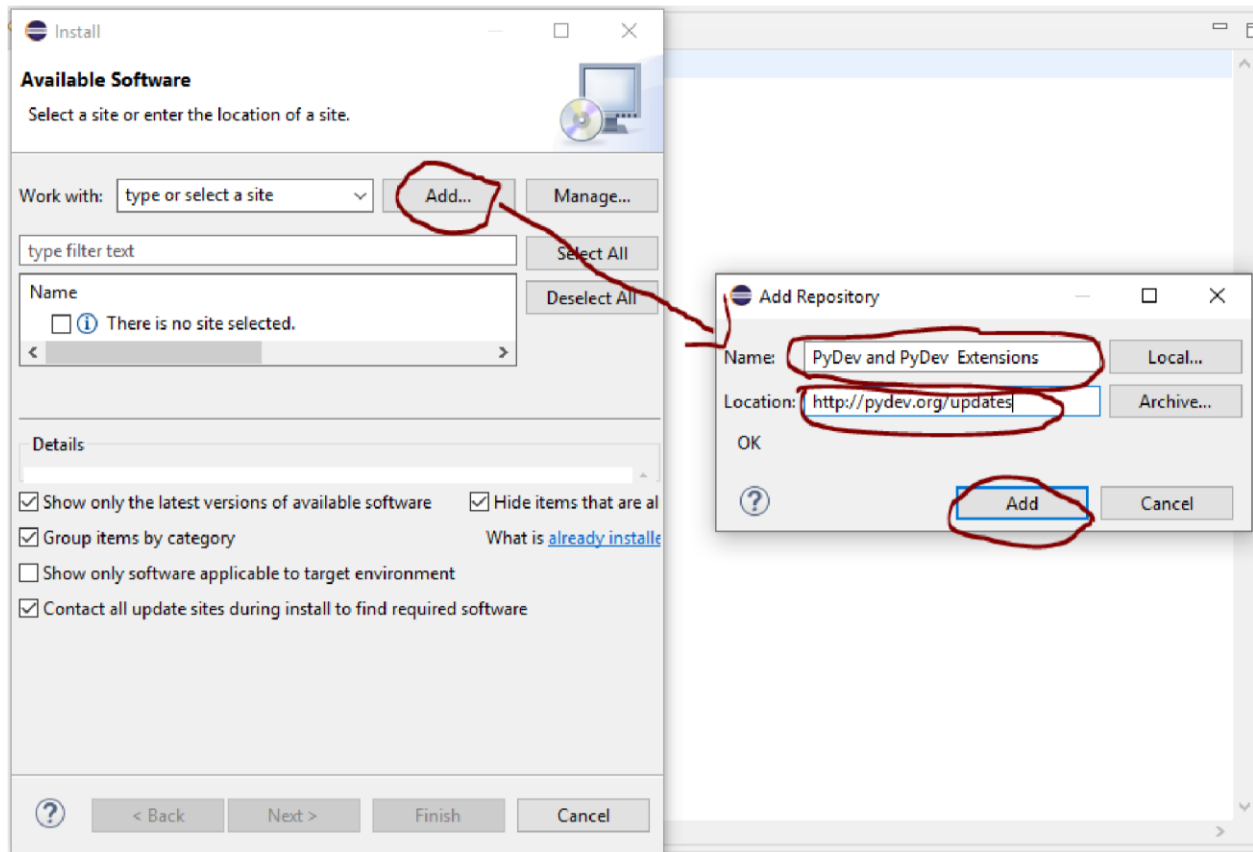


Figure 3. Set up Python on Eclipse c.

After entering the update sites, select the update site you entered or select "All available sites" and add a filter for PyDev, so that it shows the contents of all the update sites that have PyDev, then select what you want to install and click 'Next' (see Figure 4).

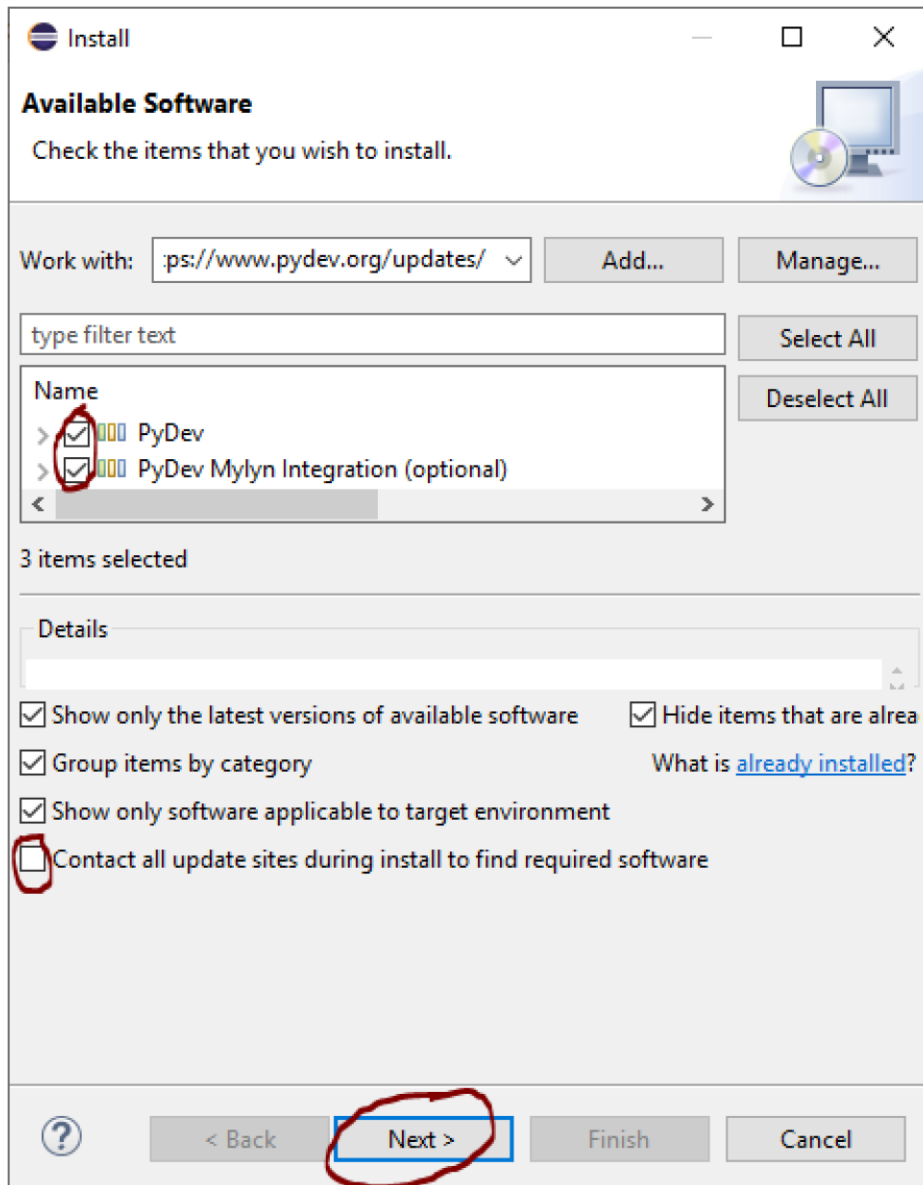


Figure 4. Set up Python on Eclipse. d.

Then, UNCHECK the 'Contact all update sites during install to find required software' and press 'Next' again to confirm your selection (see Figure 5).

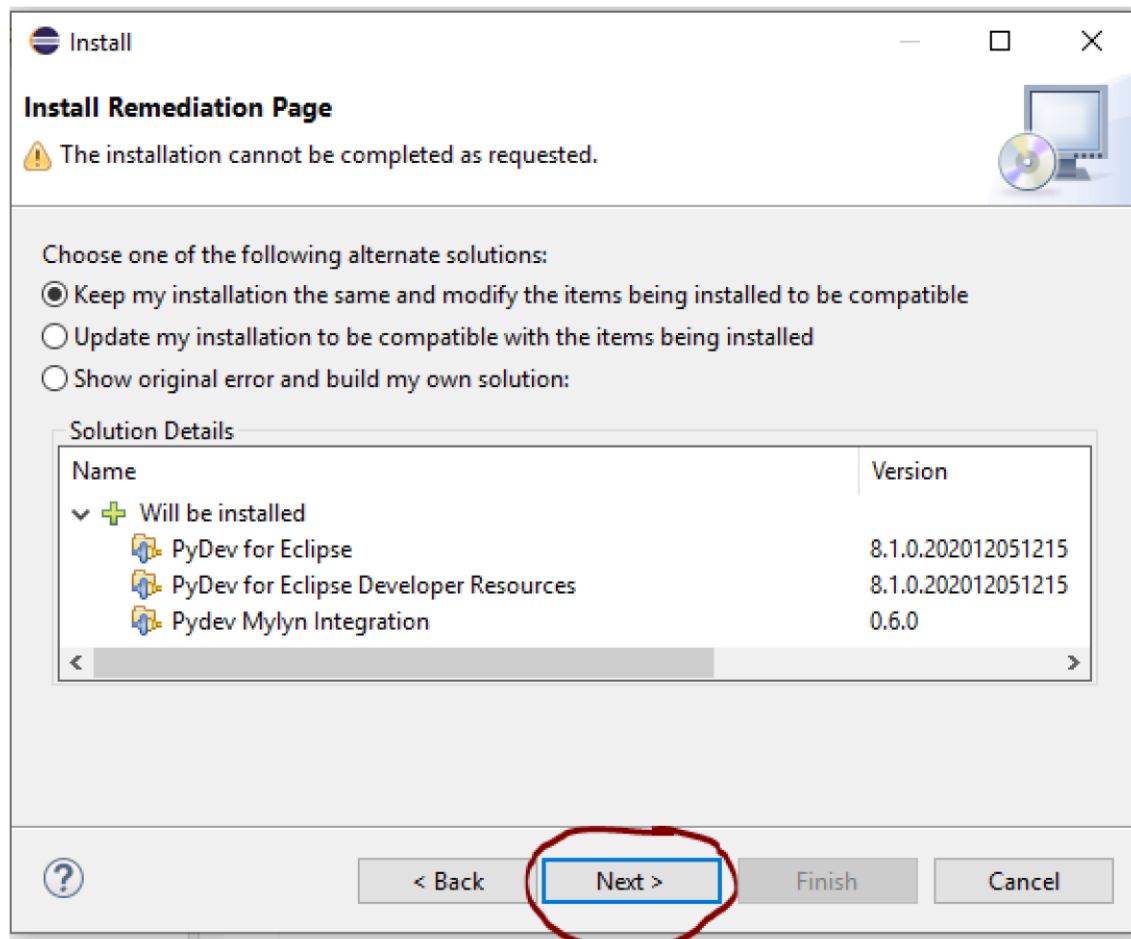


Figure 5. Set up Python on Eclipse. e.

And finally, read the license agreement and if you accept, select the accept radio button and click 'Finish' (see Figure 6).

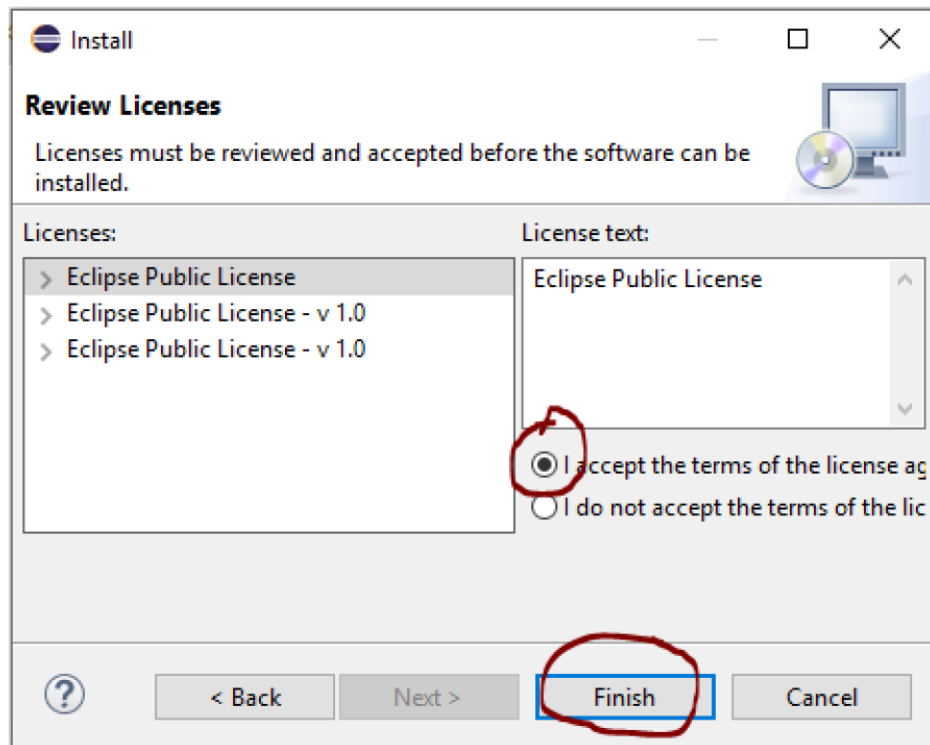


Figure 6. Set up Python on Eclipse

STEP 2: Checking the installation: You can verify if it is correctly installed going to the menu 'window> preferences' and checking if there is a PyDev item under that (see Figure 7). After that eclipse will display the graphical interface for python perspective, the main components are (see Figure 8):

- Project space is the section where all your python projects are visualized,
- Project Editor is the section where python scripts can be edited,
- Console allows the visualization of results father running a python script, Page | 9 SDN-Labs
- Run bottom allows to run a python script,

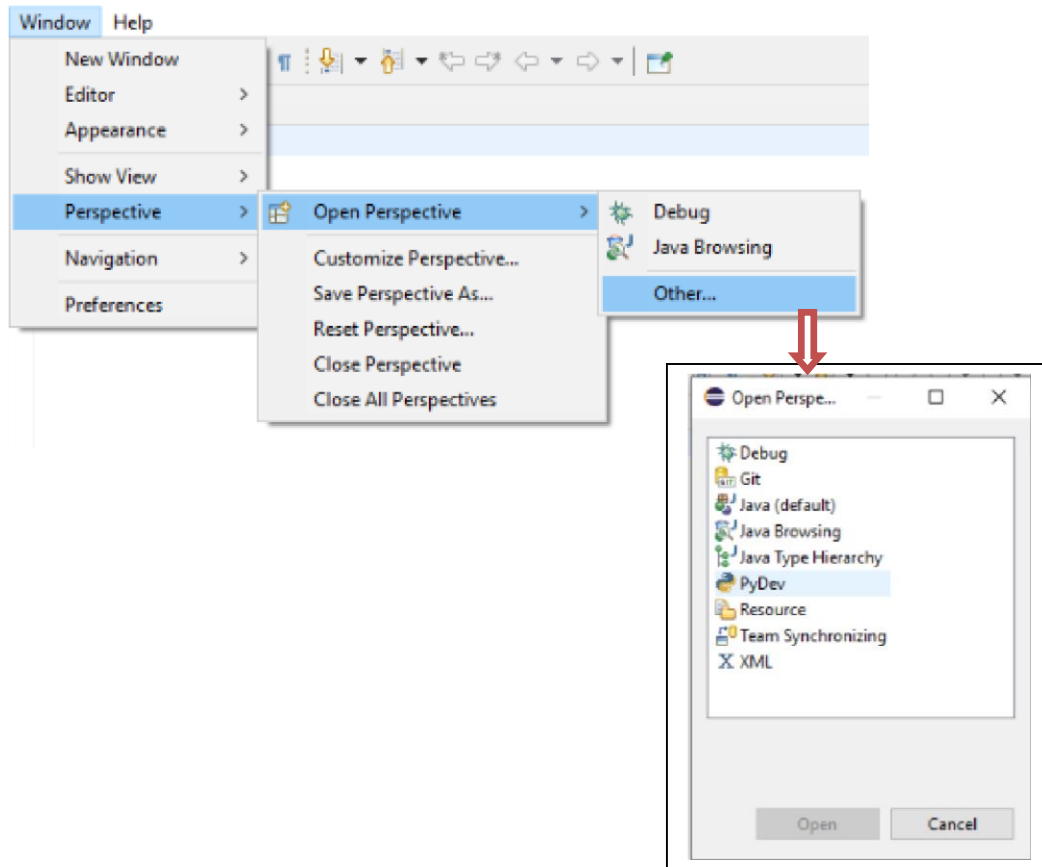
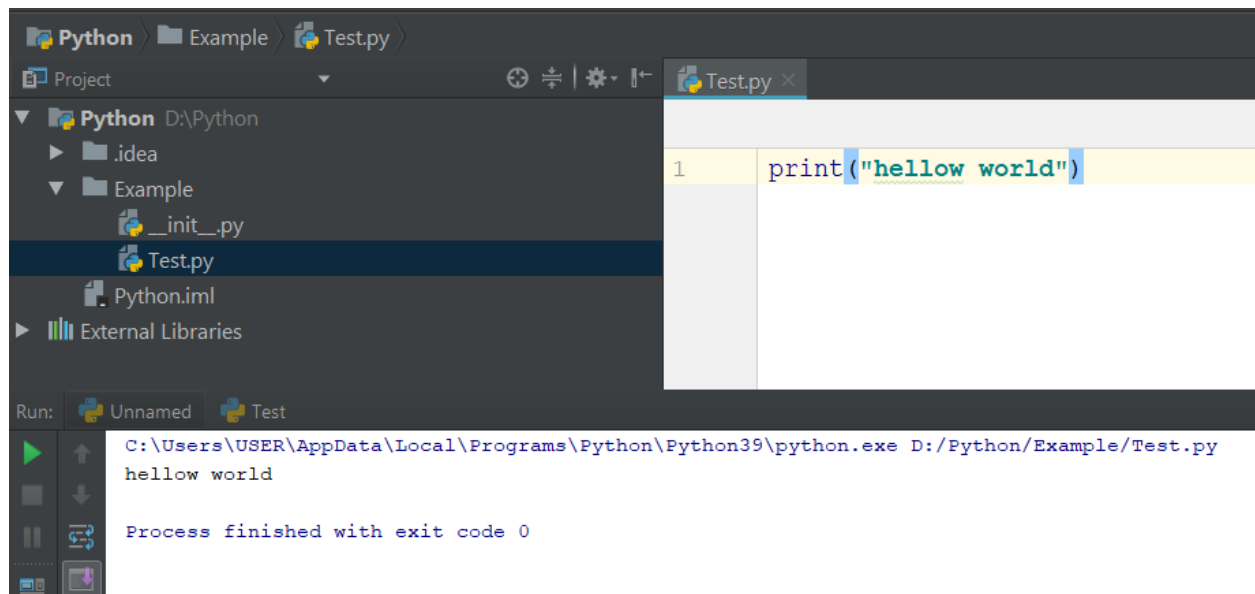


Figure 7. Python perspective in Eclipse.

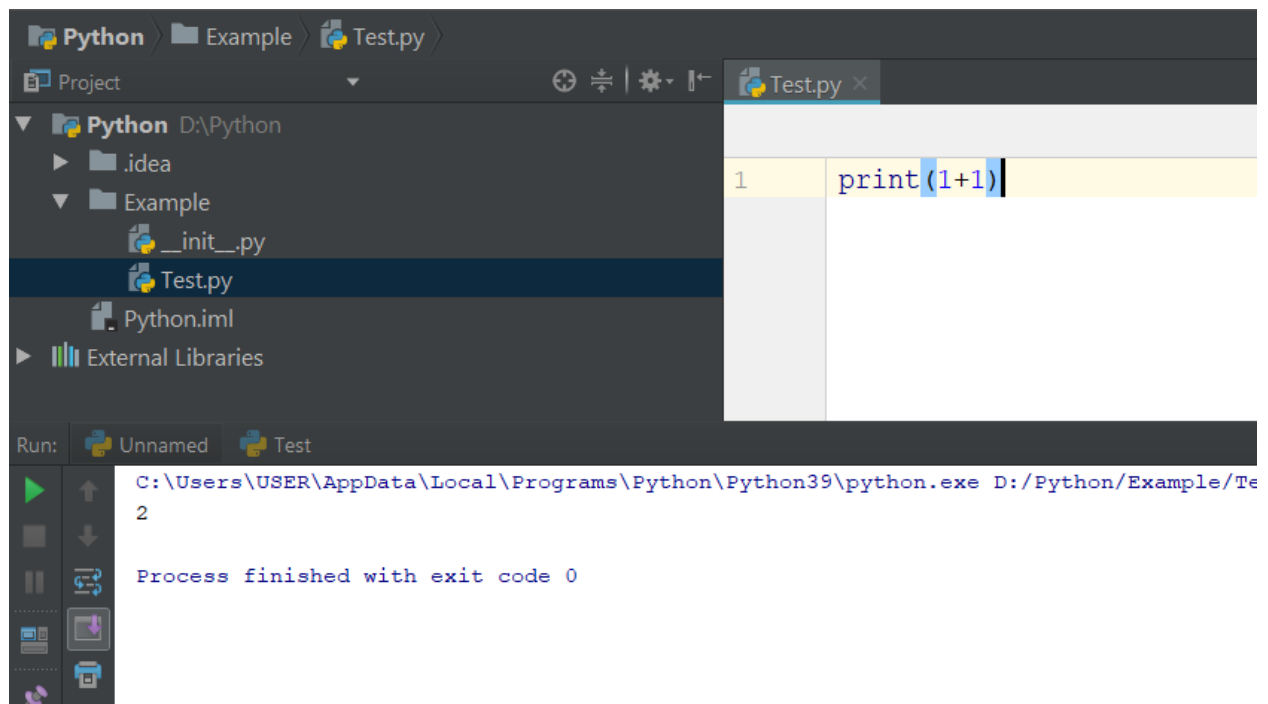
### Exercises:

**Exercise 4.1.2:** Write a Hello World





#### Exercise 4.1.3: Compute 1+1



#### Exercise 4.1.4: Type in program text

The screenshot shows an IDE window with a Python project named 'Example'. The file explorer on the left shows the project structure, including 'Test.py'. The main editor displays the code for 'Test.py', which calculates the area of a parallelogram, a square, a circle, and the volume of a cone. The code is as follows:

```
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
```

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  
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.

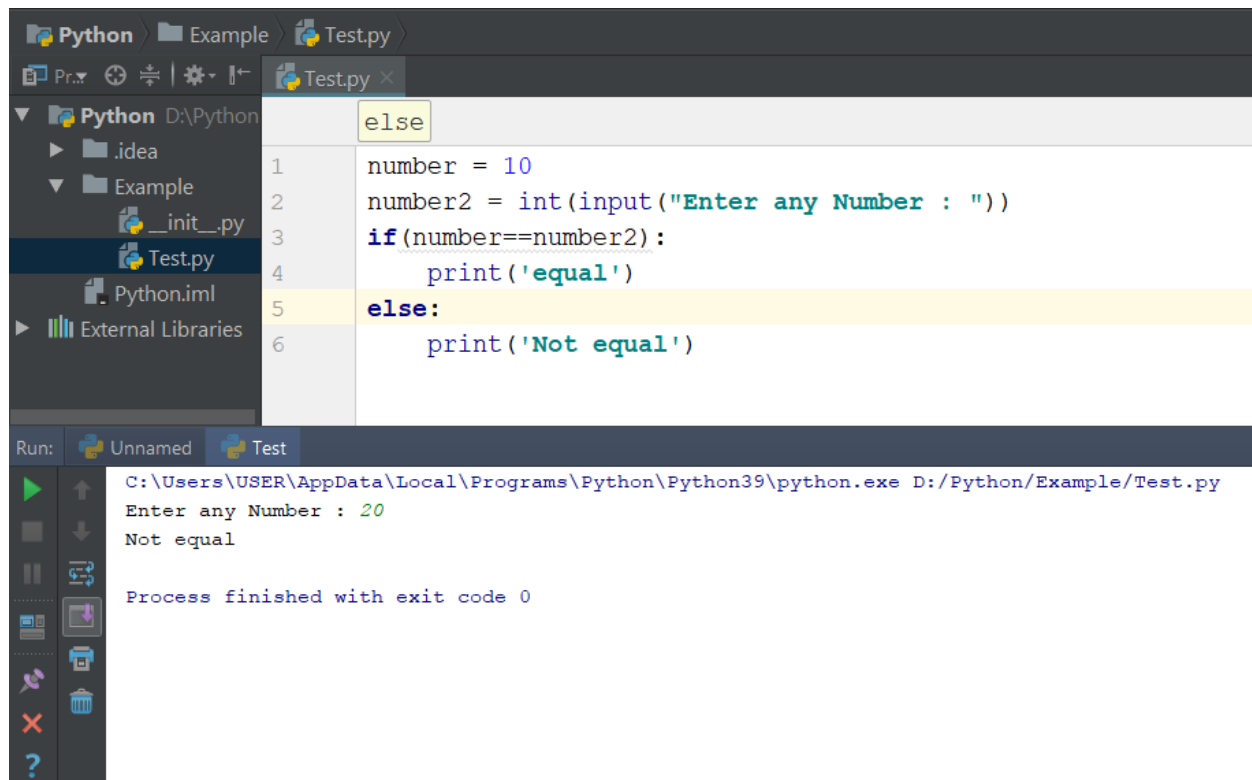
The screenshot displays an IDE with a Python file named `Test.py` in the `Example` directory. The script performs various arithmetic operations on two input numbers, 20 and 10, and prints the results using string formatting.

```
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))
```

The Run window shows the execution of the script, displaying the prompts and the resulting arithmetic calculations:

```
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 window with a file explorer on the left and a code editor on the right. The file explorer shows a project named 'Python' with subfolders '.idea' and 'Example'. The 'Example' folder contains files '\_init\_.py' and 'Test.py'. The 'Test.py' file is selected and its code is displayed in the editor. The code is as follows:

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

Below the code editor, the 'Run' tab is active, showing the execution command and 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
```

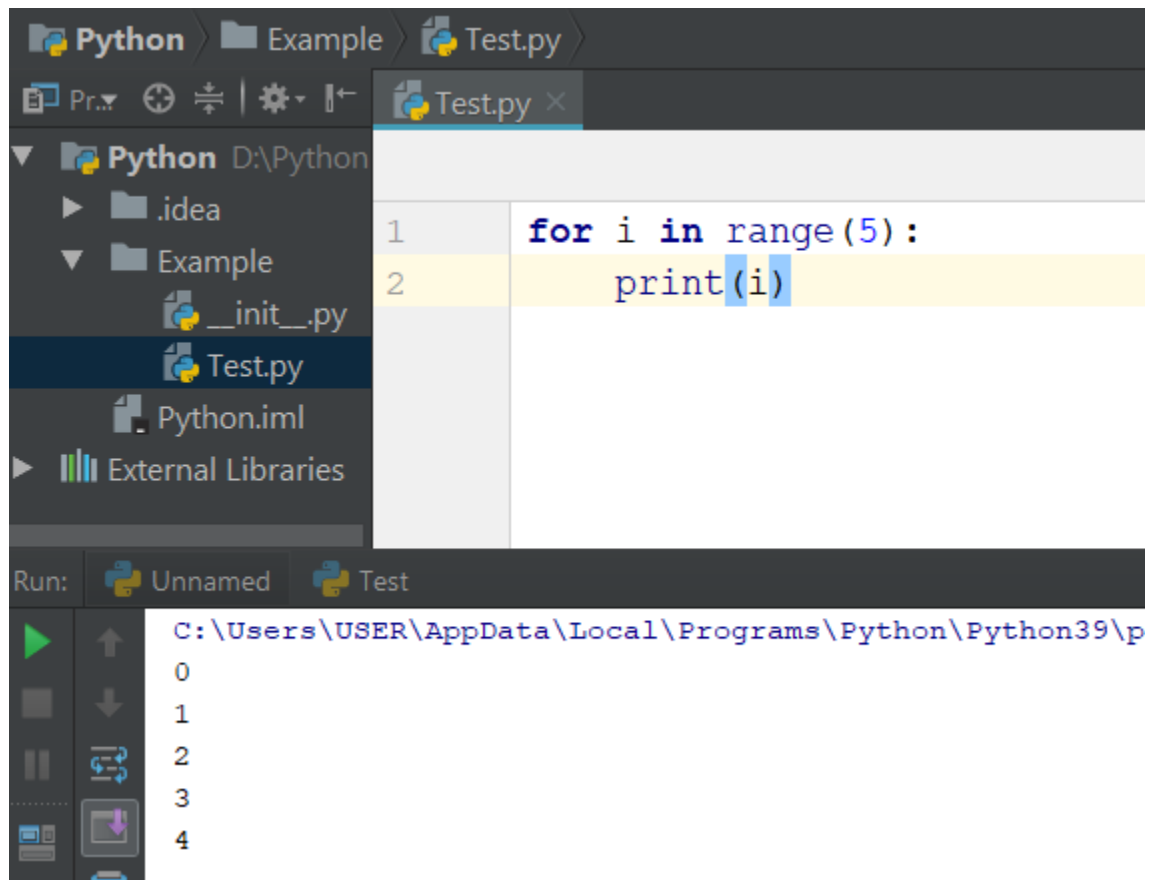
### Exercise 4.2.3: The while Statement

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 path 'C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/' and the input 'Enter any number :15'. The output is a list of numbers from 10 to 15, each on a new line. The process finished with exit code 0.

#### Exercise 4.2.4: The for Statement



**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?

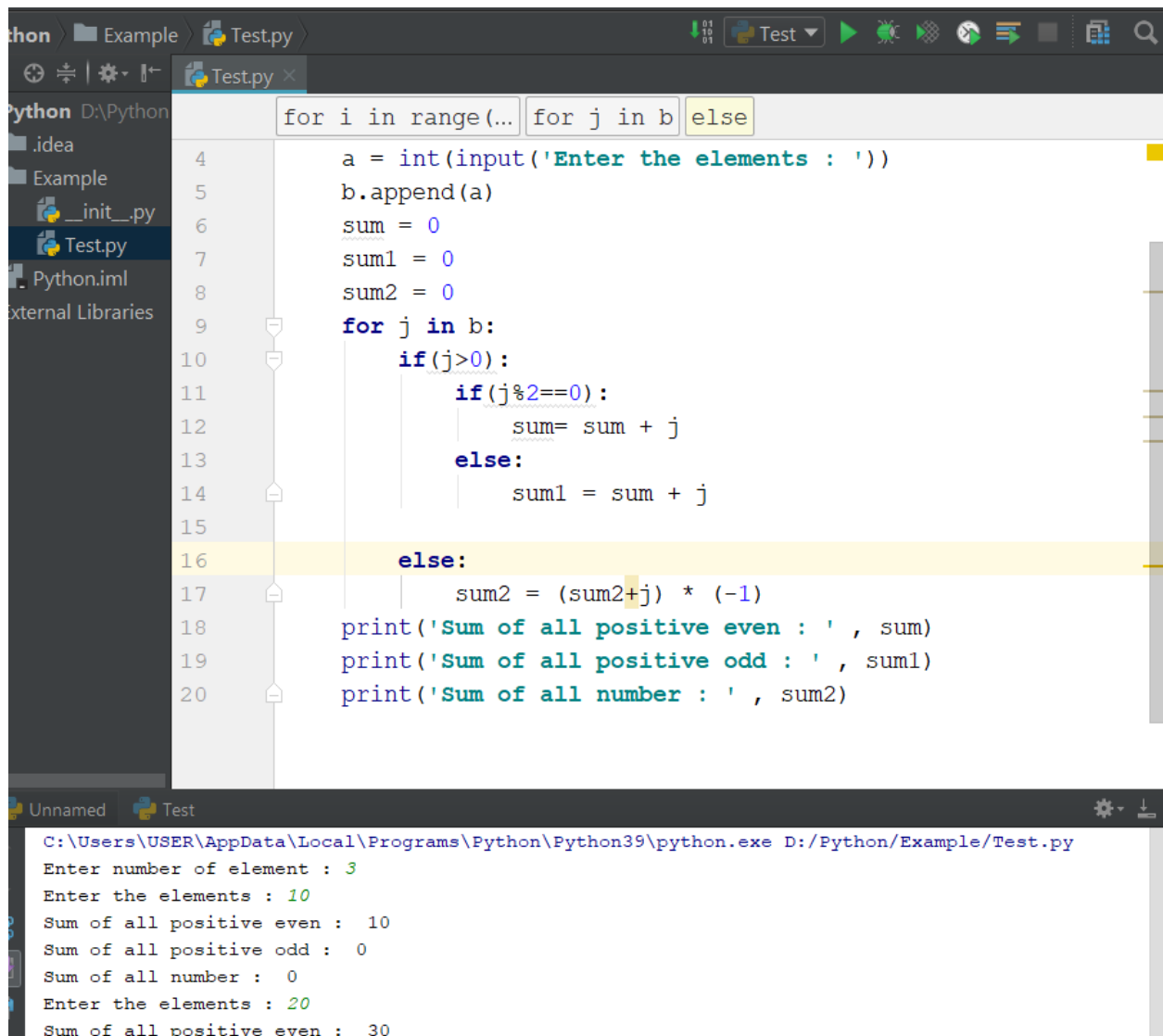
### **Answer:**

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' open. The code defines a list 'b' and calculates the sum of its elements based on their parity. The execution console shows the program running twice, with inputs 10 and 20, and corresponding outputs for the sum of positive even numbers, the sum of positive odd numbers, and the sum of all numbers.

```
Python D:\Python\Example\Test.py
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)
```

```
Unnamed Test
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.