

Lab-Report

Report No: 01

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Submitted by

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Submitted To

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Experiment No: 01

Experiment name: Introduction to Python

Theory:

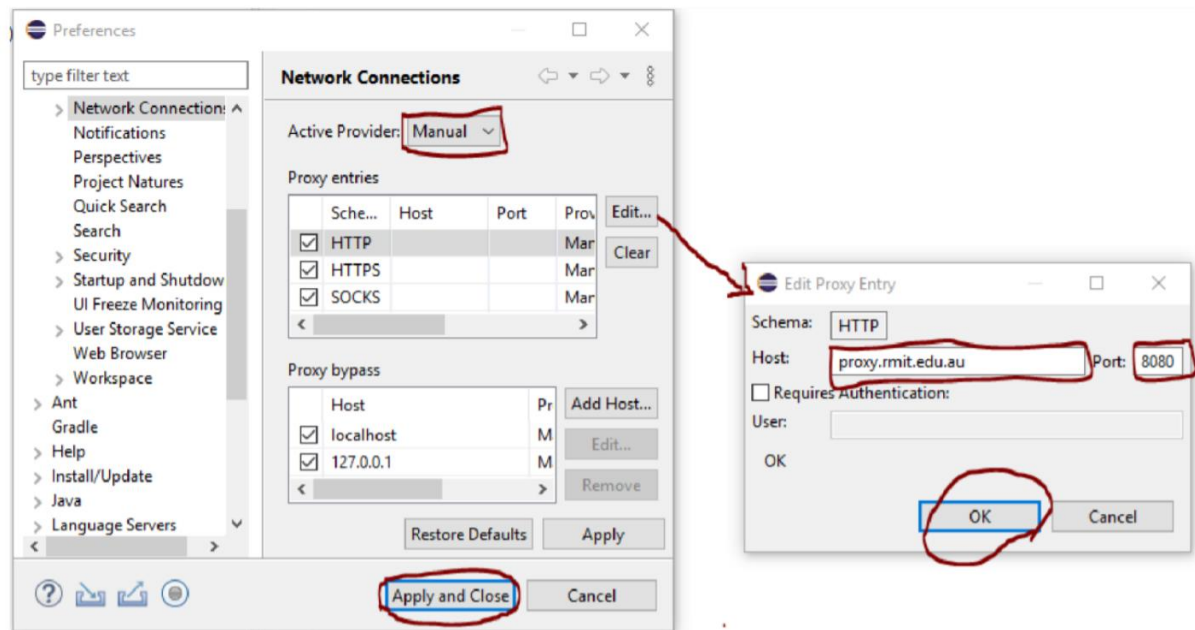
Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. **Python's** design philosophy emphasizes code readability with its notable use. **Python's** simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. **Python** supports modules and packages, which encourages program modularity and code reuse.

Methodology:

First we have to set up the environment of python in our computer.

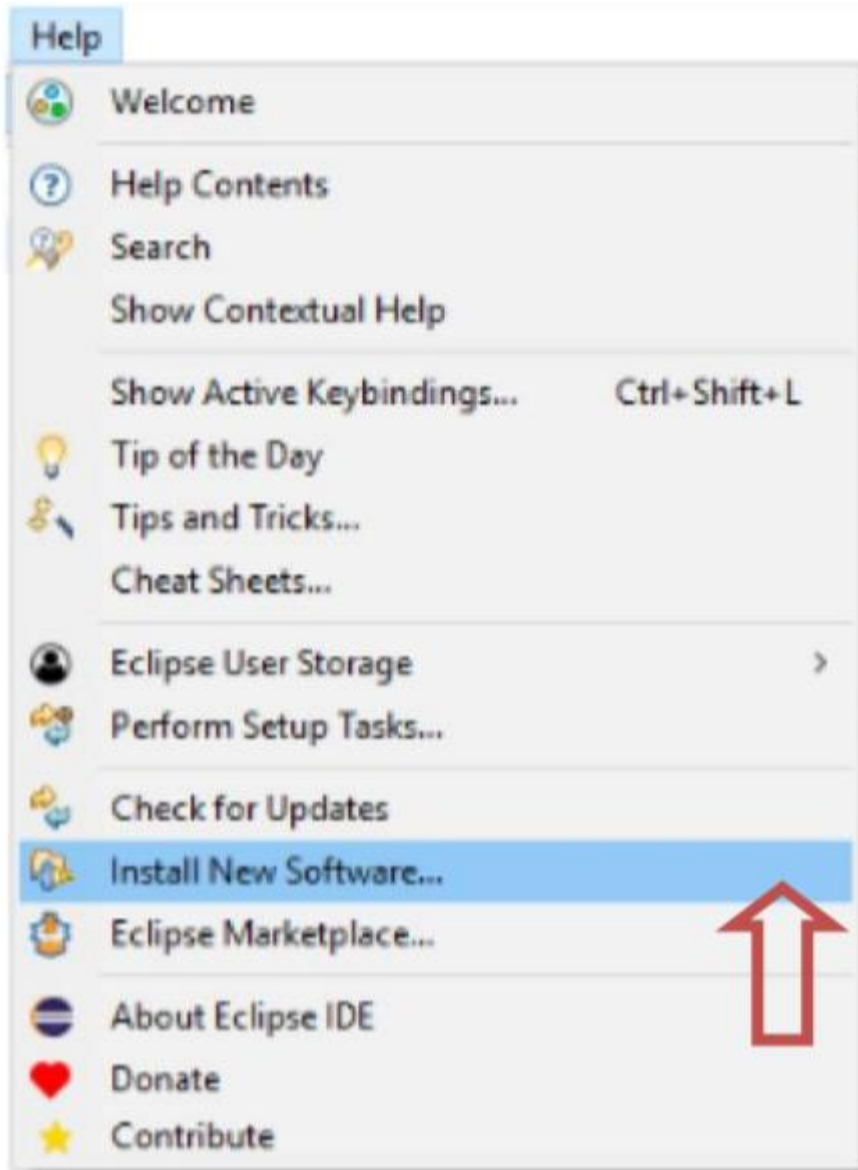
We have to open Eclipse and setup a correct access to Internet (This is required only in RMIT network). In order to set up Manual Proxy follow the instructions:

- 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.

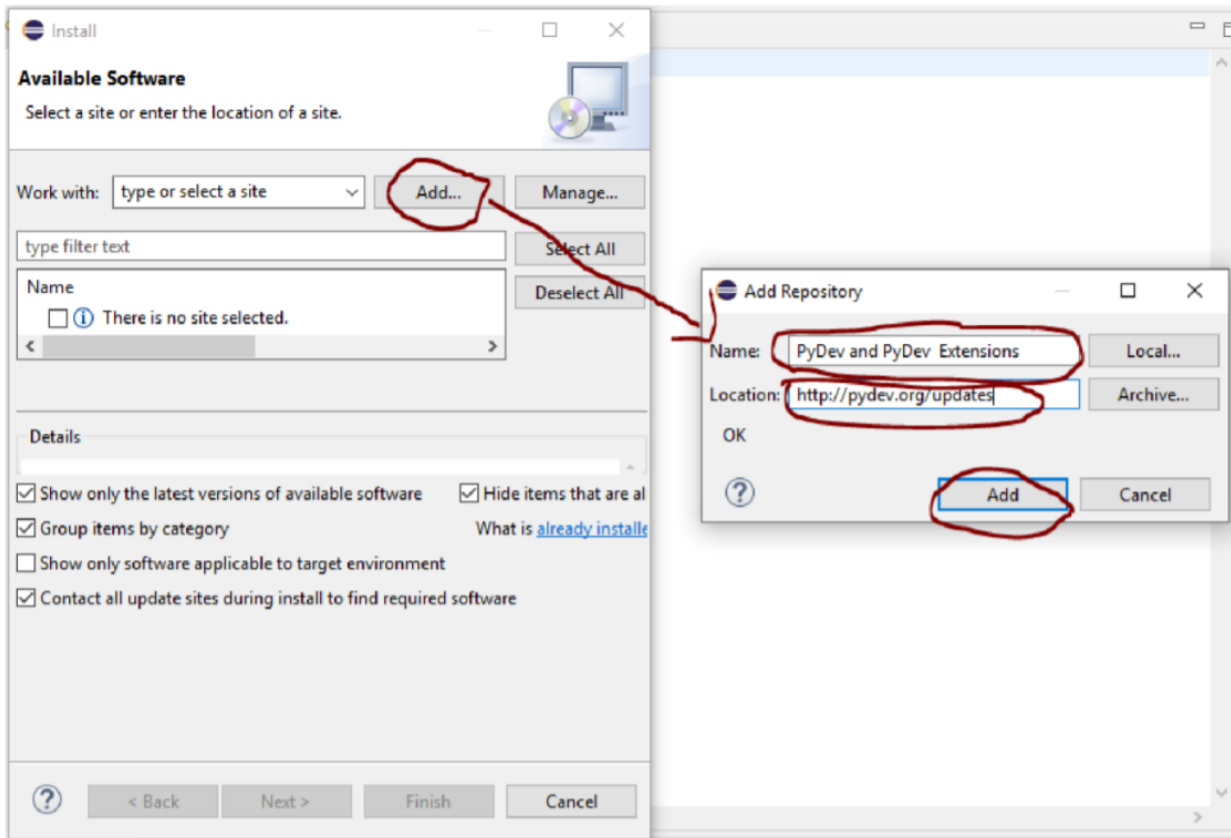


Installing python environment using Eclipse Graphical Interface1 .


- 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:



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




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':

 Install

Available Software


Check the items that you wish to install.




Work with: Add... Manage...

Select All Deselect All

Name

☒  PyDev

☒  PyDev Mylyn Integration (optional)

3 items selected


Details

☒ Show only the latest versions of available software ☒ Hide items that are already installed

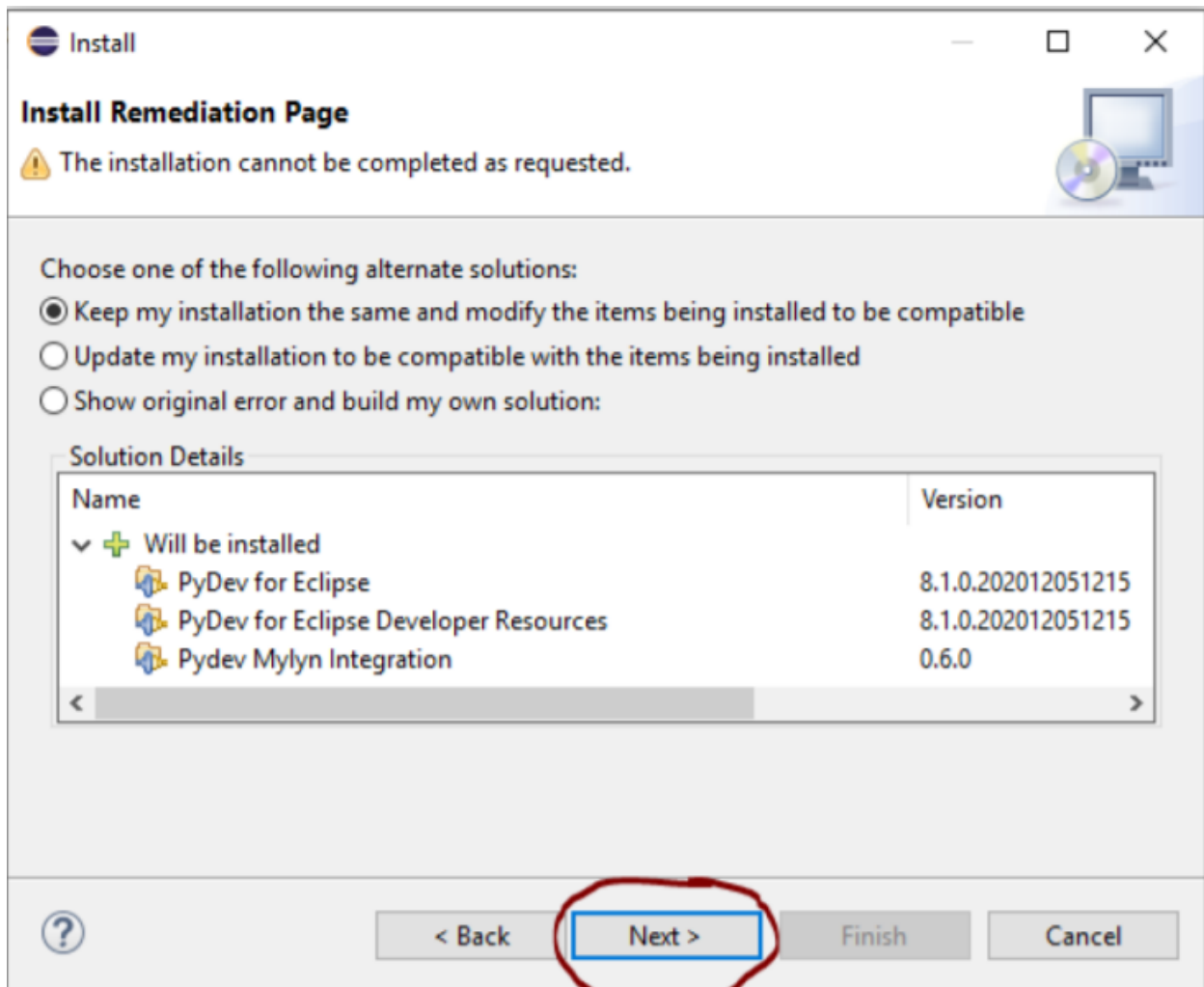
☒ Group items by category What is [already installed?](#)

☒ Show only software applicable to target environment

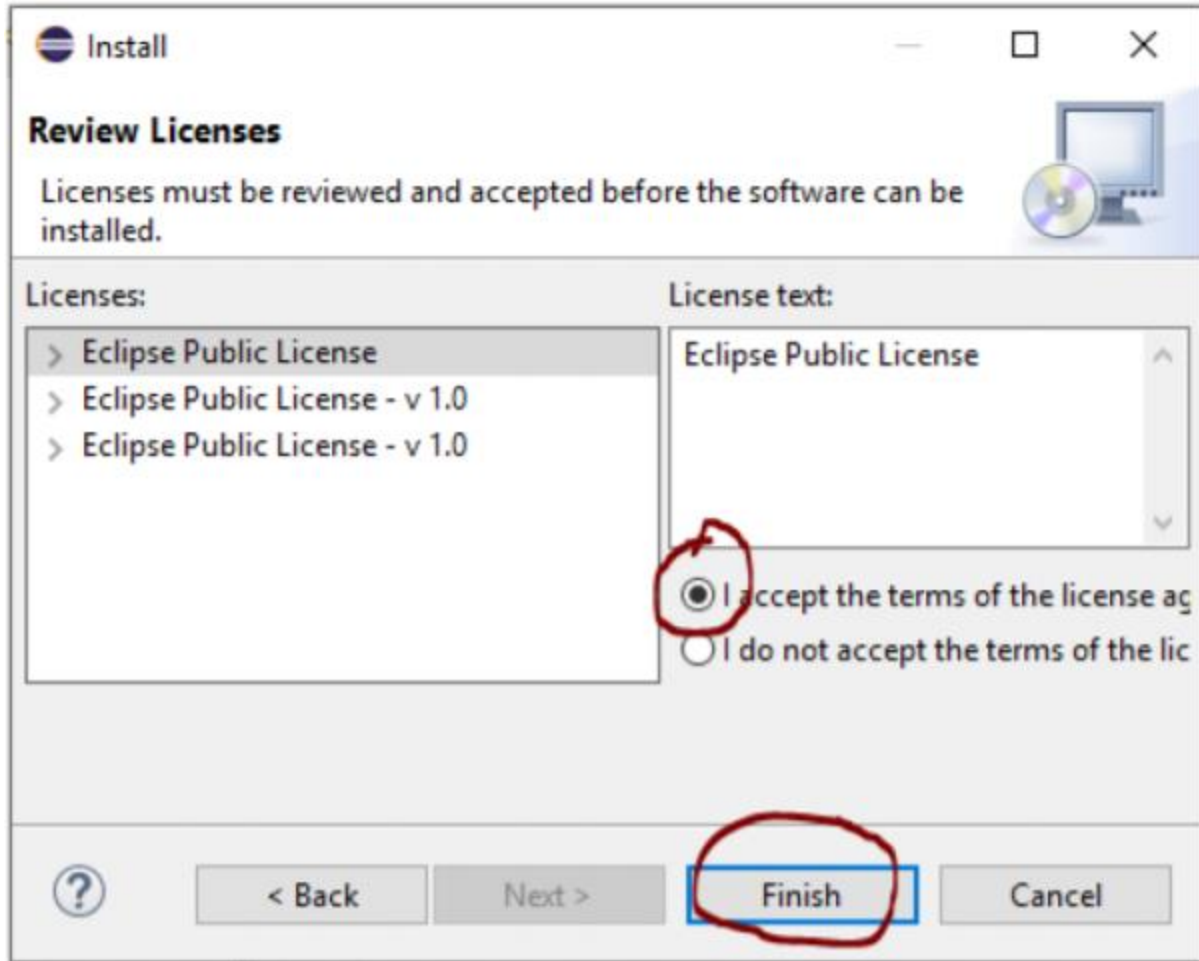
☐ Contact all update sites during install to find required software

 < Back Next > Finish Cancel

Then, UNCHECK the 'Contact all update sites during install to find required software' and press 'Next' again to confirm your selection

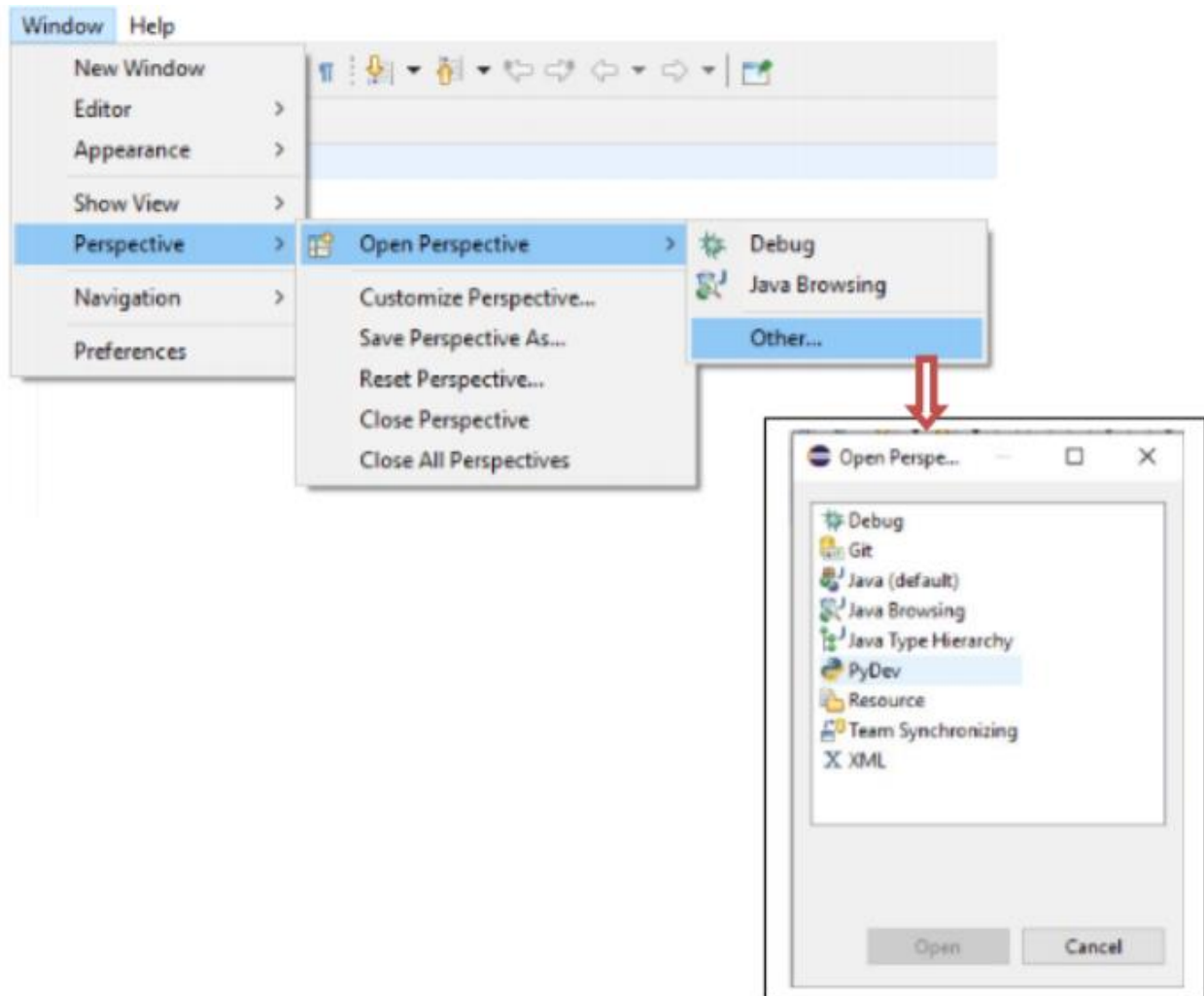


And finally, read the license agreement and if you accept, select the accept radio button and click 'Finish'



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:

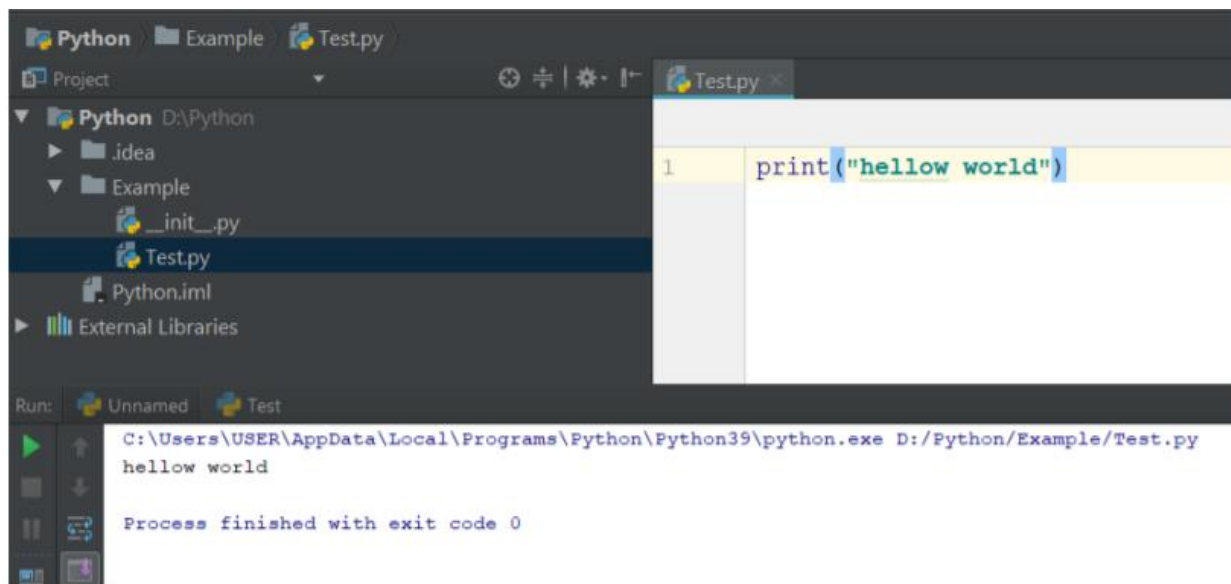
- Project space is the section where all your python projects are visualized,
 - Project Editor is the section where python scripts can be edited,
 - Console allows the visualization of results father running a python script,
- Page | 9 SDN-Labs
- Run bottom allows to run a python script,



Exercises:

Write a program which print Hello World.

Answer:



Write a basic program in Python:

Answer:

The image shows a screenshot of an IDE with a Python project. The left sidebar displays the project structure: Python, Example, and Testpy. The main editor window shows the code for Test.py, which performs various arithmetic operations on two input numbers, x and y. The code includes comments for each operation and uses the .format() method for string formatting. The bottom panel shows the output of the program, which prompts the user to enter two numbers (20 and 10) and displays the results of addition, subtraction, multiplication, power, division, floor division, and modulo operations.

```
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 = 10240000000000

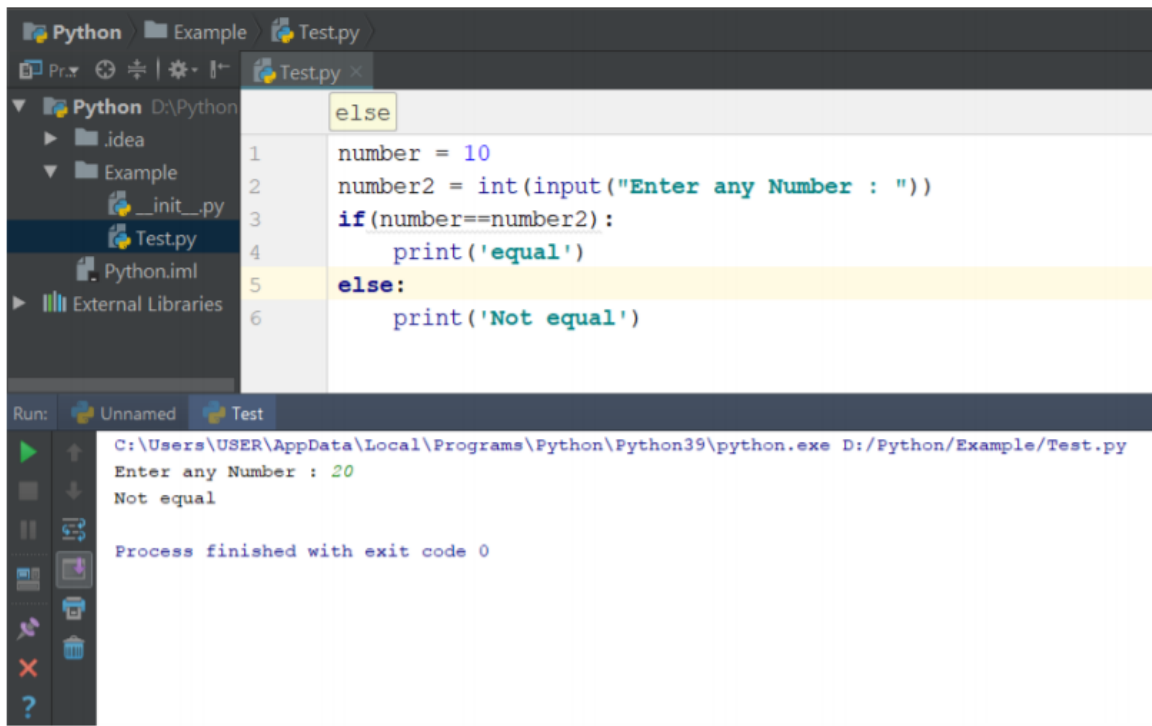
Divide of 20 & 10 = 2.0

FLoor of 20 & 10 = 2

Modulo of 20 & 10 = 0

The if statement:

Answer:



The screenshot shows a Python IDE with a file named `Test.py` in the `Example` directory. The code in the file is as follows:

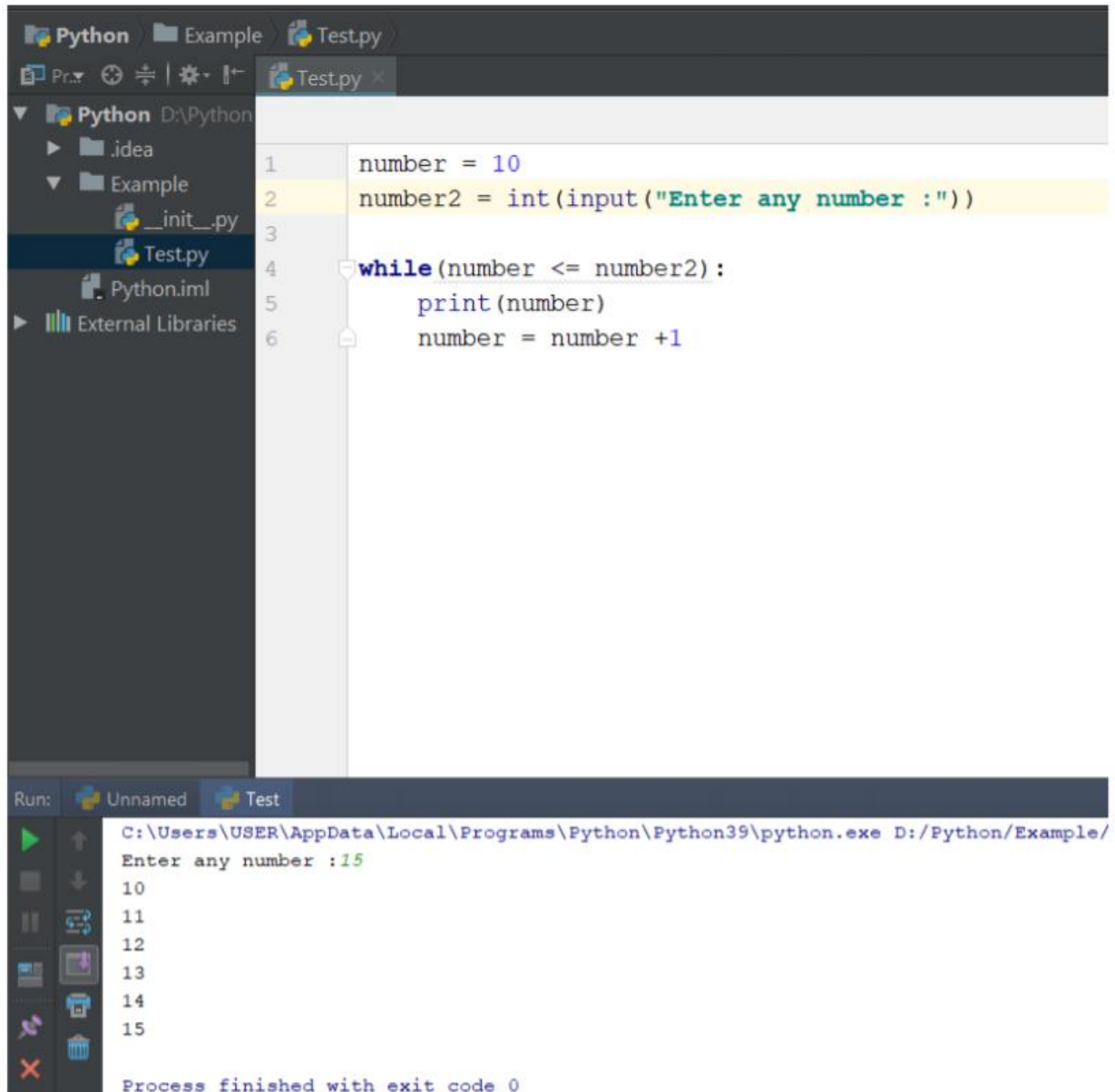
```
1 number = 10
2 number2 = int(input("Enter any Number : "))
3 if(number==number2):
4     print('equal')
5 else:
6     print('Not equal')
```

The `else:` line is highlighted in yellow. Below the code editor, the `Run` tab is active, showing the execution path 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
```

The while Statement:

Answer:



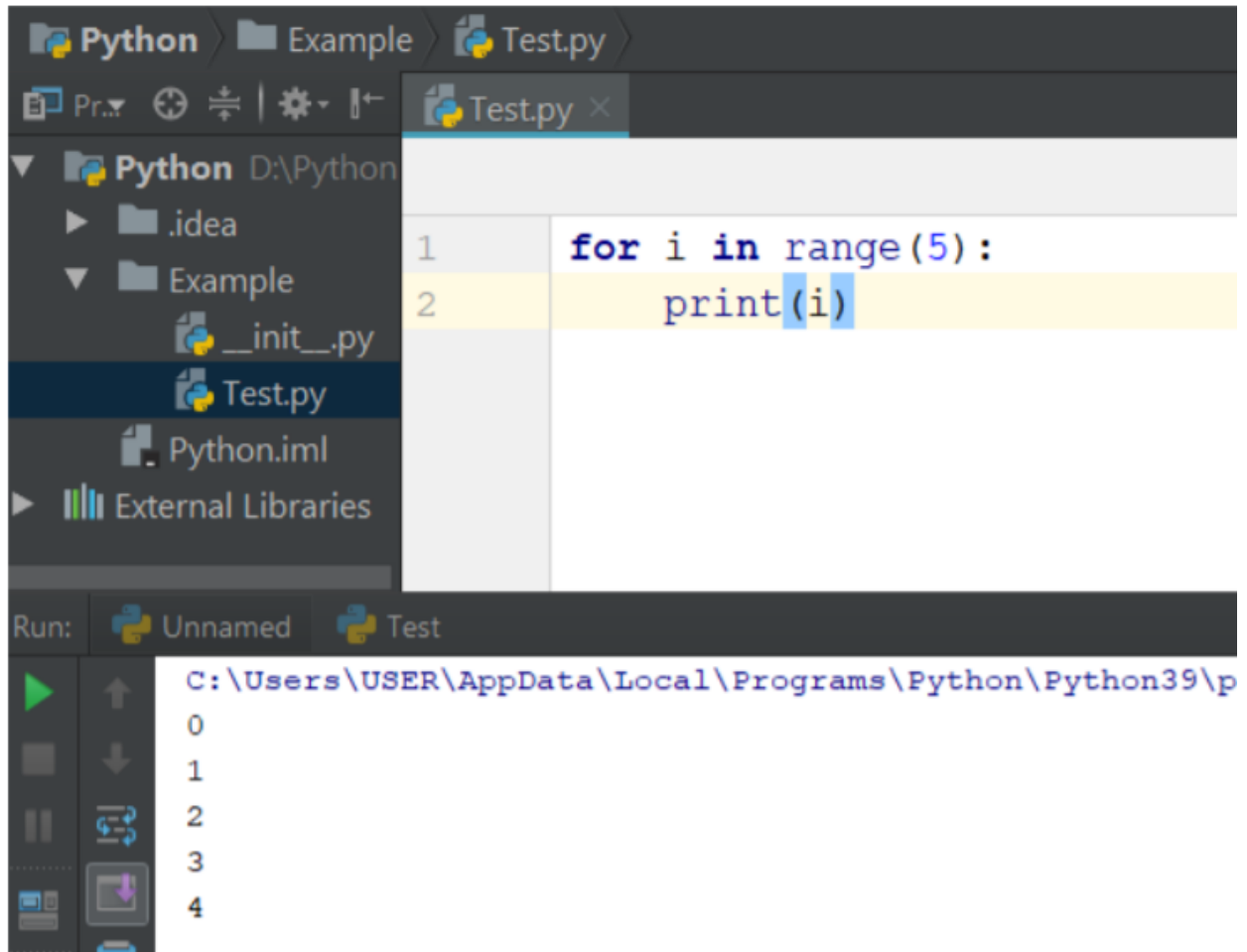
The image shows a screenshot of a Python IDE. The top pane displays a file named `Test.py` with the following code:

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

The bottom pane shows the execution output for the `Test` run configuration. It displays the command prompt path, the input provided, the sequence of numbers printed, and the final exit code.

```
Run: Unnamed Test
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
```

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.

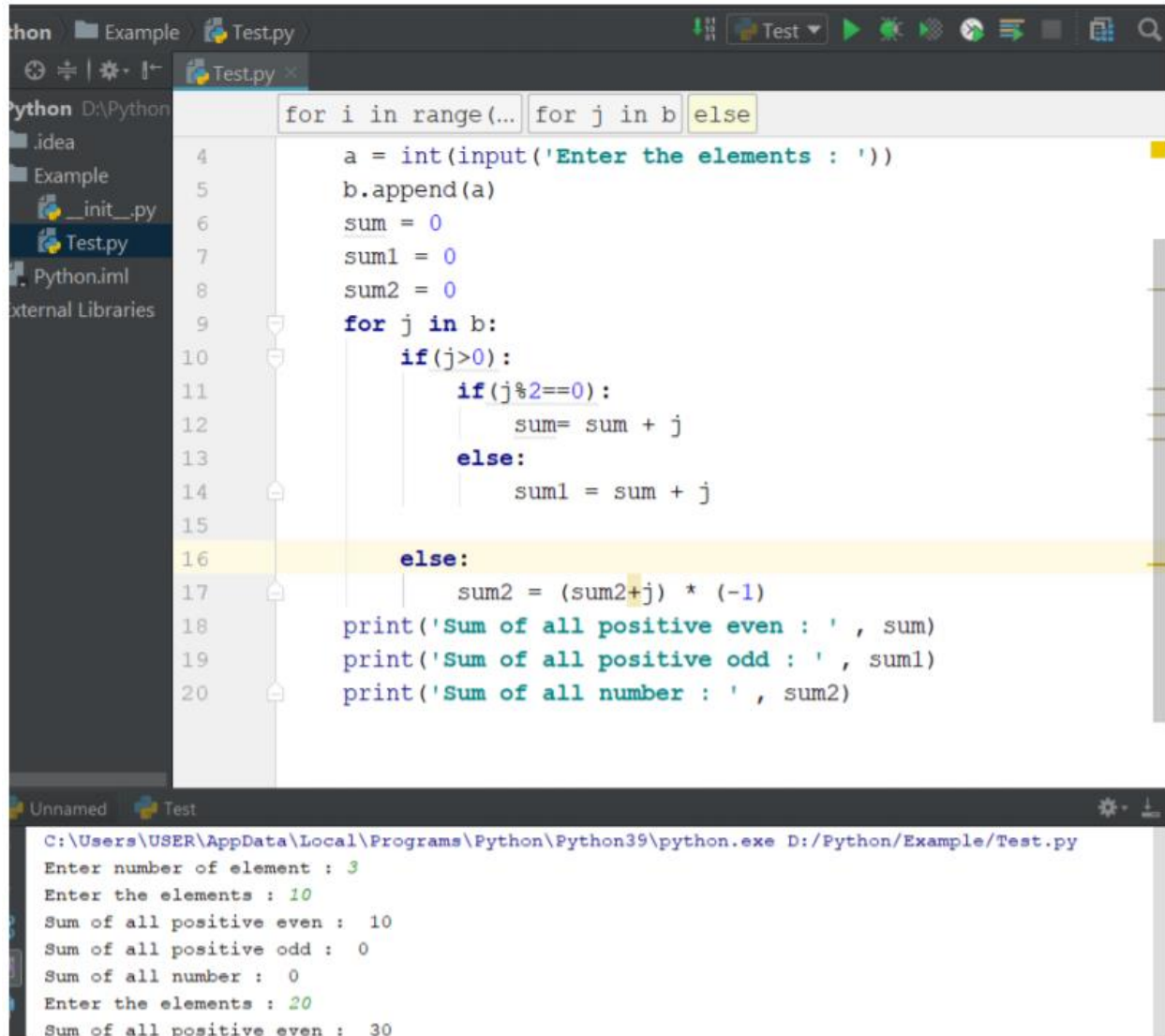
Question 5.3: Which is the difference between empty module and main module when creating a python script?

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 image shows a screenshot of a Python IDE. The top pane displays a Python script named 'Test.py' with the following code:

```
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
16     else:
17         sum2 = (sum2+j) * (-1)
18 print('Sum of all positive even : ' , sum)
19 print('Sum of all positive odd : ' , sum1)
20 print('Sum of all number : ' , sum2)
```

The bottom pane shows the execution output for two test cases:

```
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:

We can learn about python language in this lab. We can learn how to set up python in eclips. In python we don't need to declare any data type or header file or import classes. In this lab, we can learn about conditional statement and controllers in python.