

Lab-Report

Report No: 01

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Experiment No: 01

Experiment name: Introduction to Python

Theory:

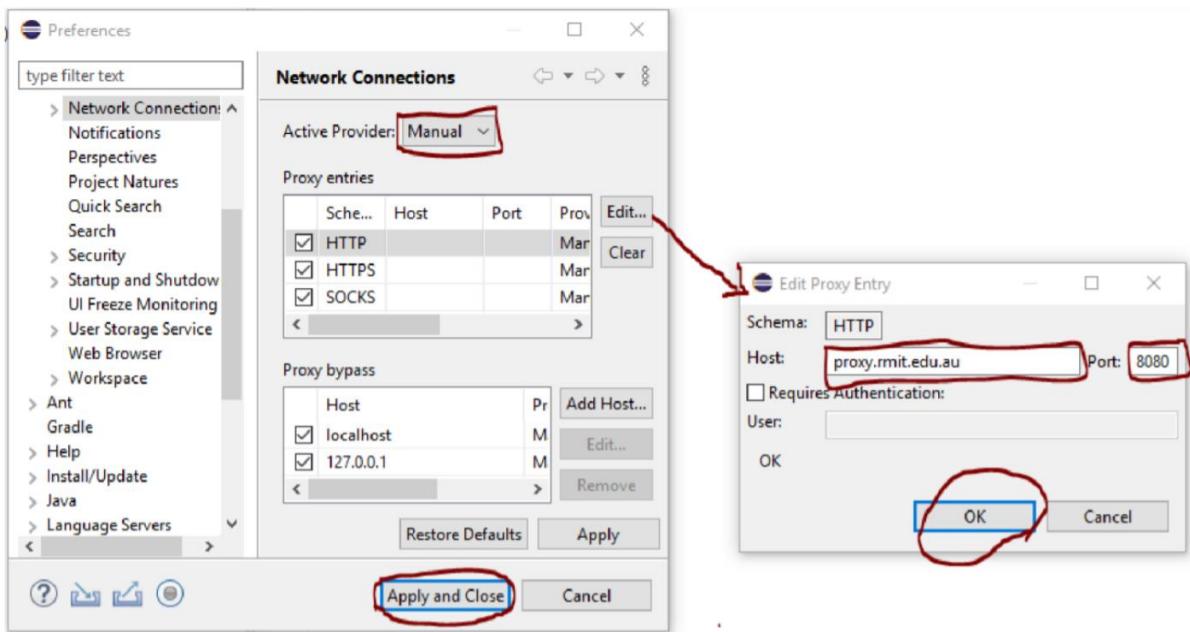
Python is an interpreted, object-oriented, high-level programming language with dynamic semantics. **Python's** design philosophy emphasizes code readability with its notable use. **Python's** simple, easy to learn syntax emphasizes readability and therefore reduces the cost of program maintenance. **Python**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

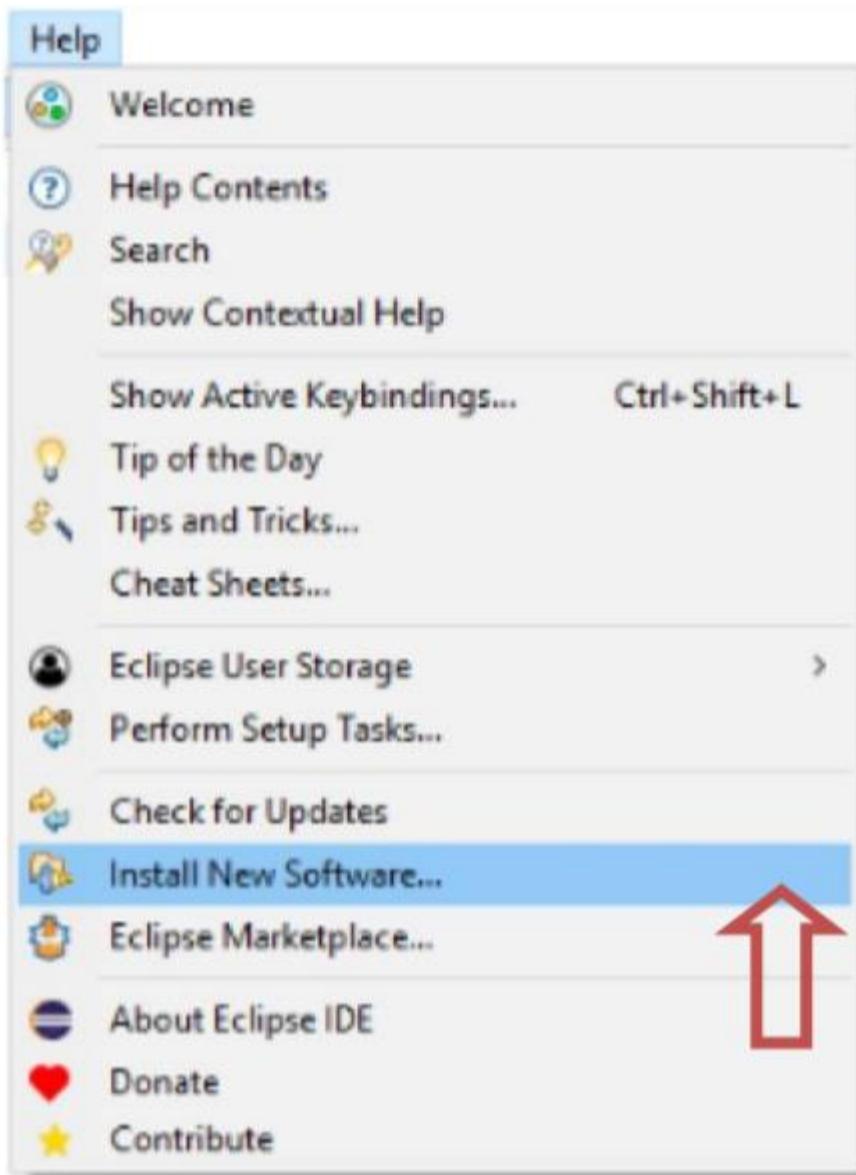
We have to open Eclipse and setup a correct access to Internet (This is required only in RMIT network). In order to set up Manual Proxy follow the instructions:

- 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.

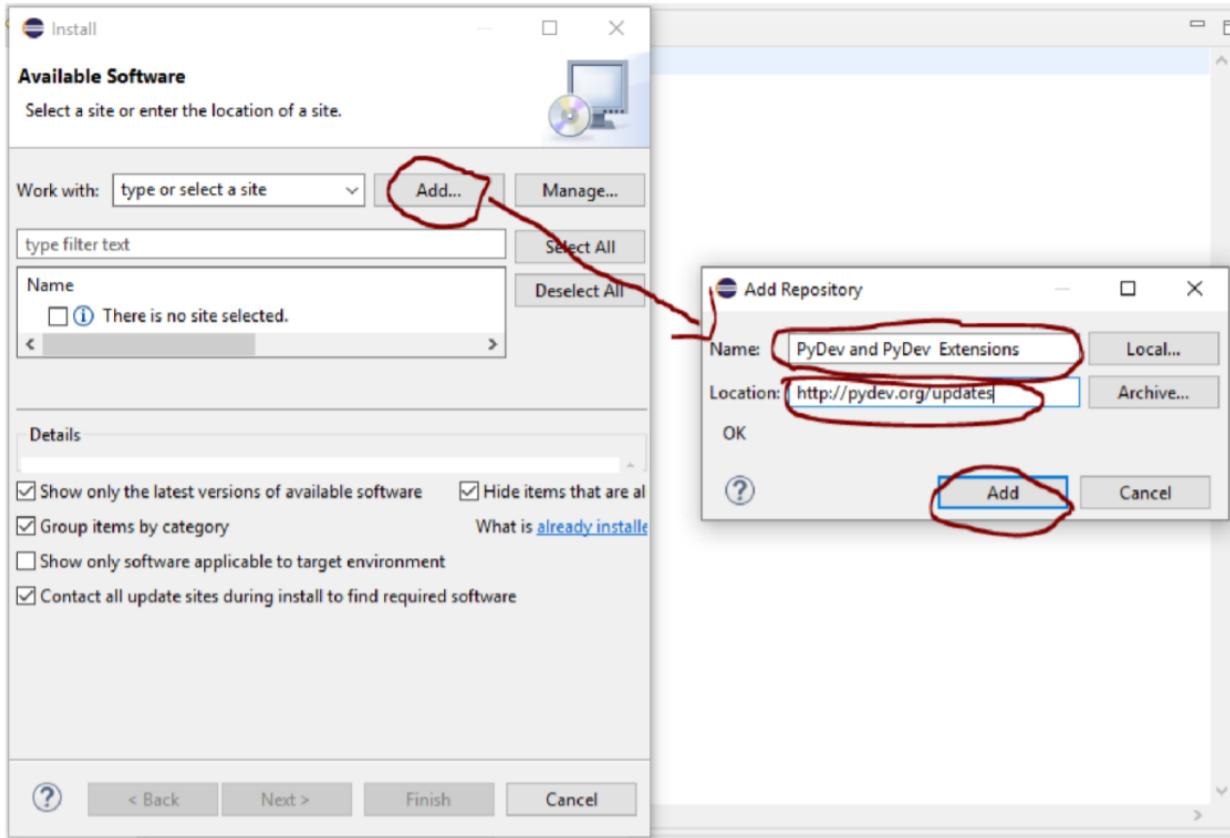


Installing python environment using Eclipse Graphical Interface1 .

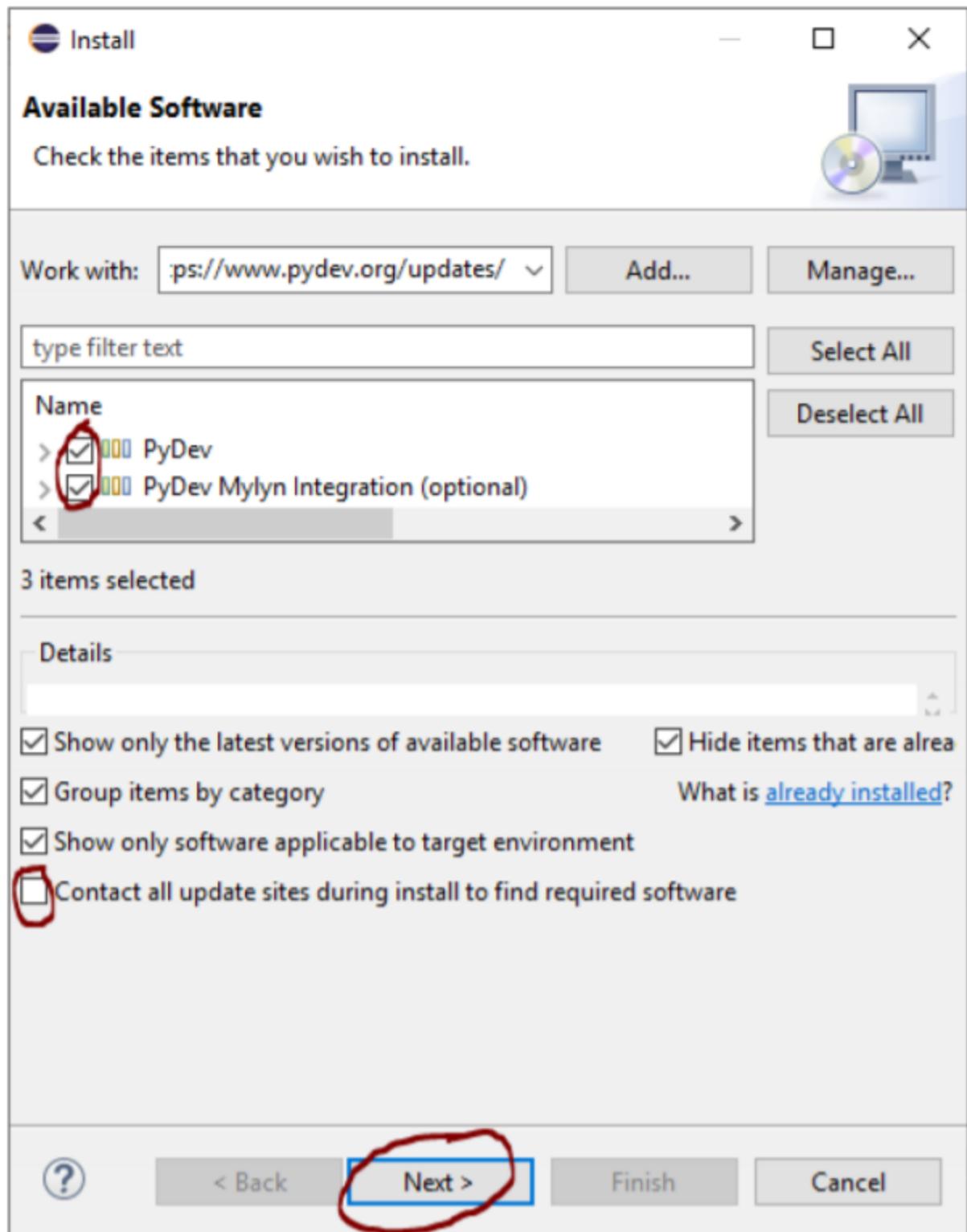
- To install PyDev and PyDev Extensions using the Eclipse Update Manager, you need to use the Help > Install New Software... menu (note that in older versions, this would be the 'Find and Install' menu) as shown in the following figure:



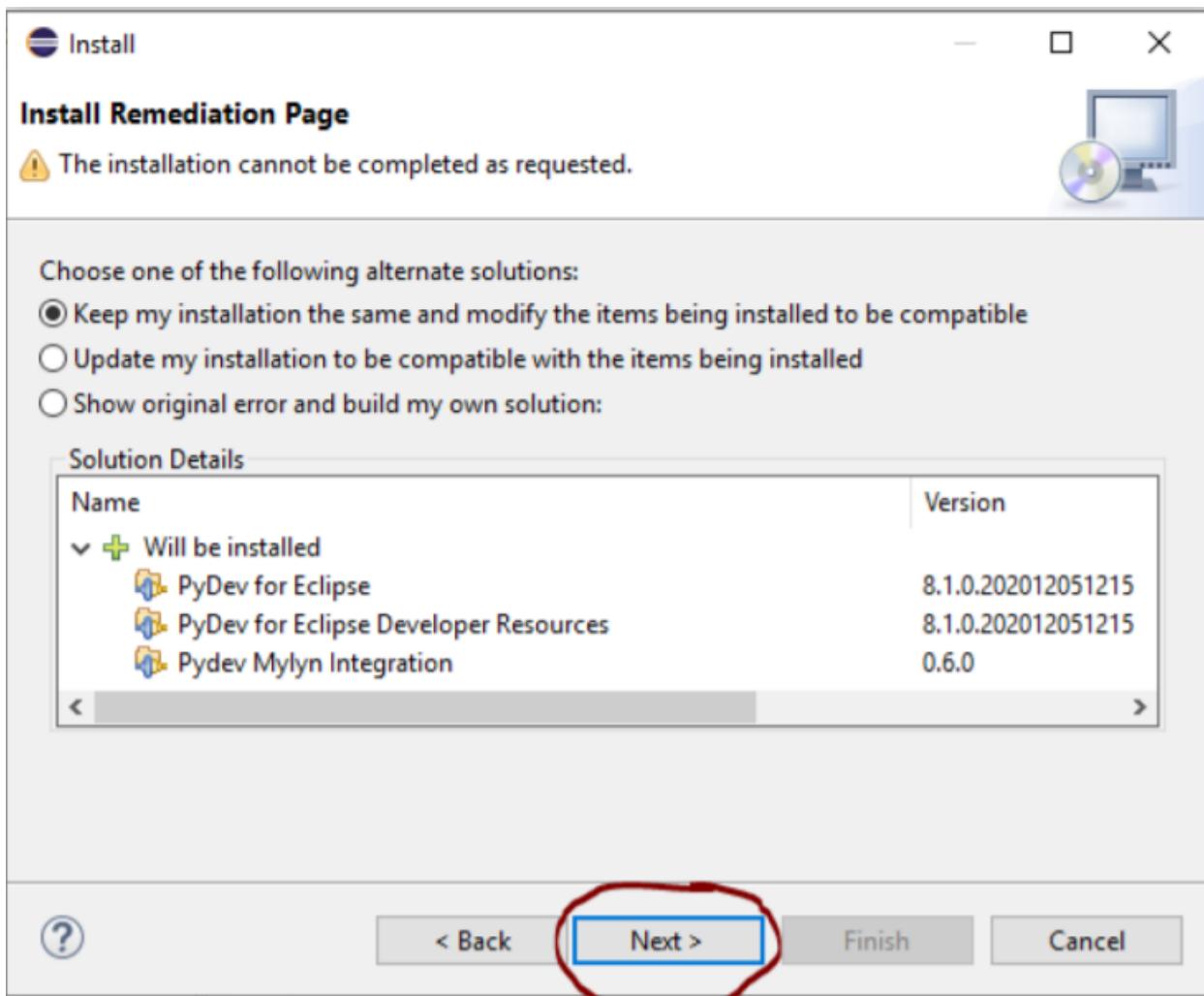
In the next screen, add the update site(s) you want to work with (see the figure below). The available update sites are:



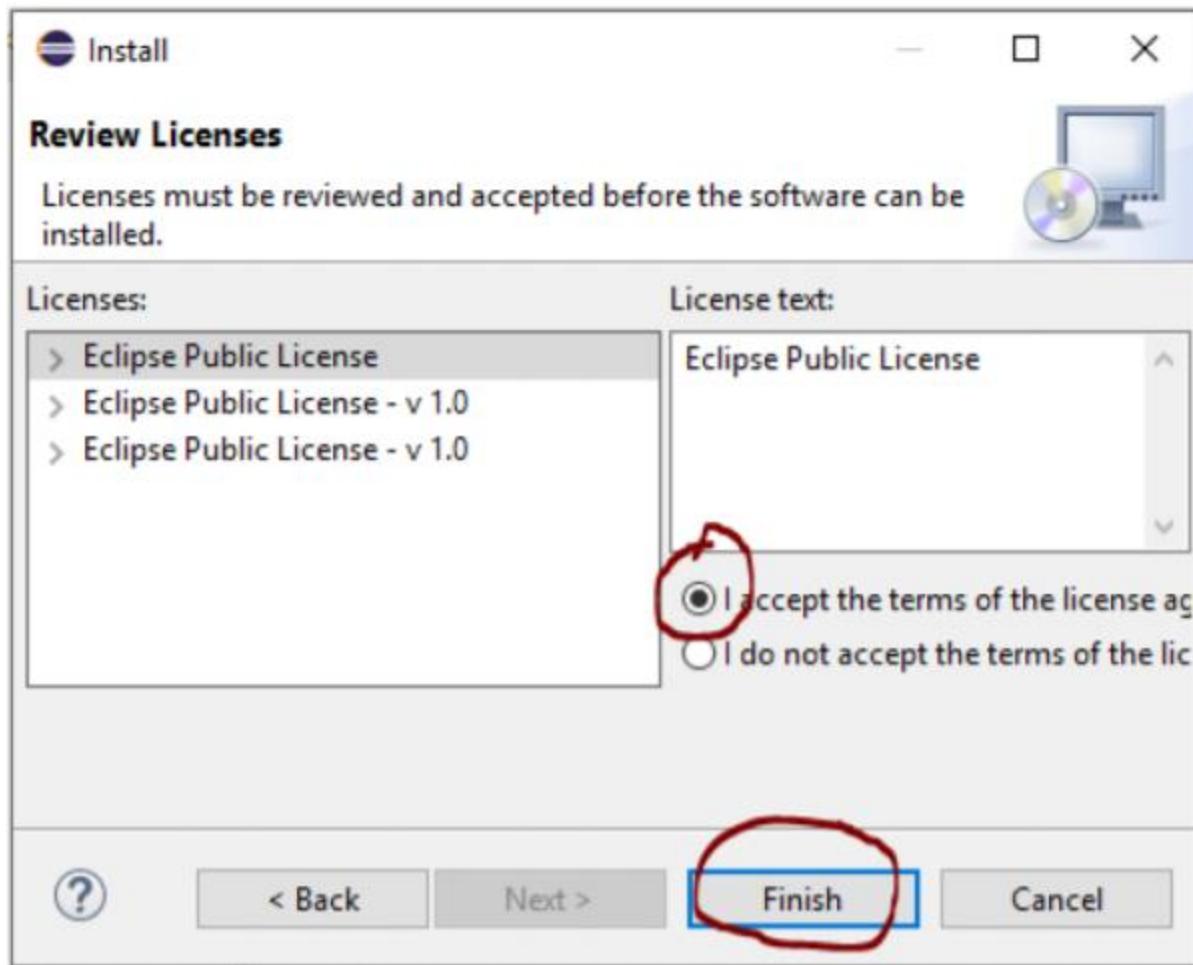
After entering the update sites, select the update site you entered or select "All available sites" and add a filter for PyDev, so that it shows the contents of all the update sites that have PyDev, then select what you want to install and click 'Next':



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

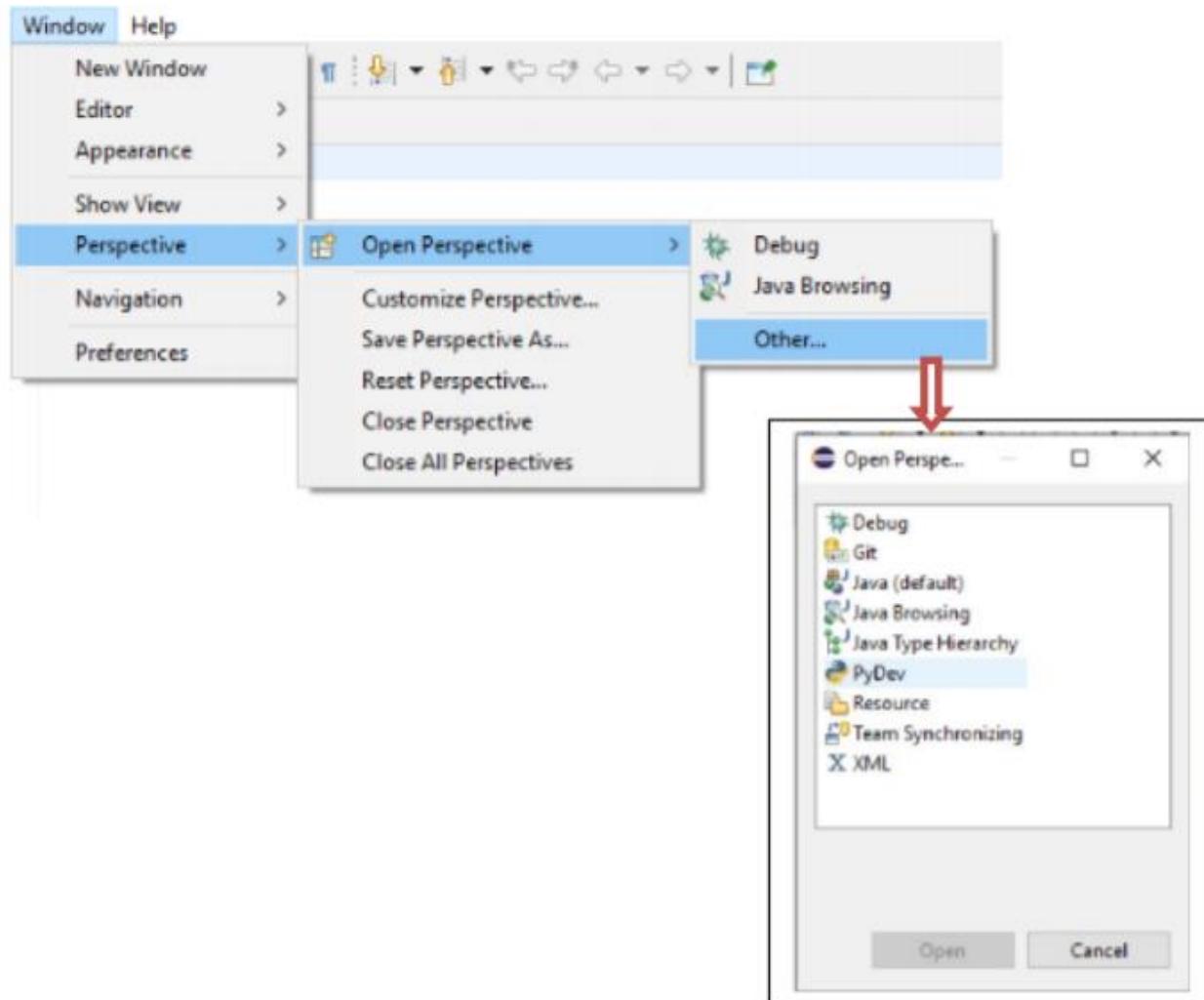


And finally, read the license agreement and if you accept, select the accept radio button and click 'Finish'



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 after 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:

The screenshot shows the PyCharm IDE interface. The top bar displays "Python Example Test.py". The left sidebar shows a project structure with a "Python" folder containing ".idea" and "Example" subfolders. Inside "Example" are files "_init_.py" and "Test.py", and a "Python.iml" file. The main editor window is titled "Test.py" and contains the code "print(\"hellow world\")". Below the editor is a "Run" tab with two entries: "Unnamed" and "Test". The "Test" entry is selected, showing the command "C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/Test.py" and the output "hellow world" followed by "Process finished with exit code 0".

Write a basic program in Python:

Answer:

The screenshot shows the PyCharm IDE interface with a Python project named "Example". The "Test.py" file is open in the editor, displaying the following code:

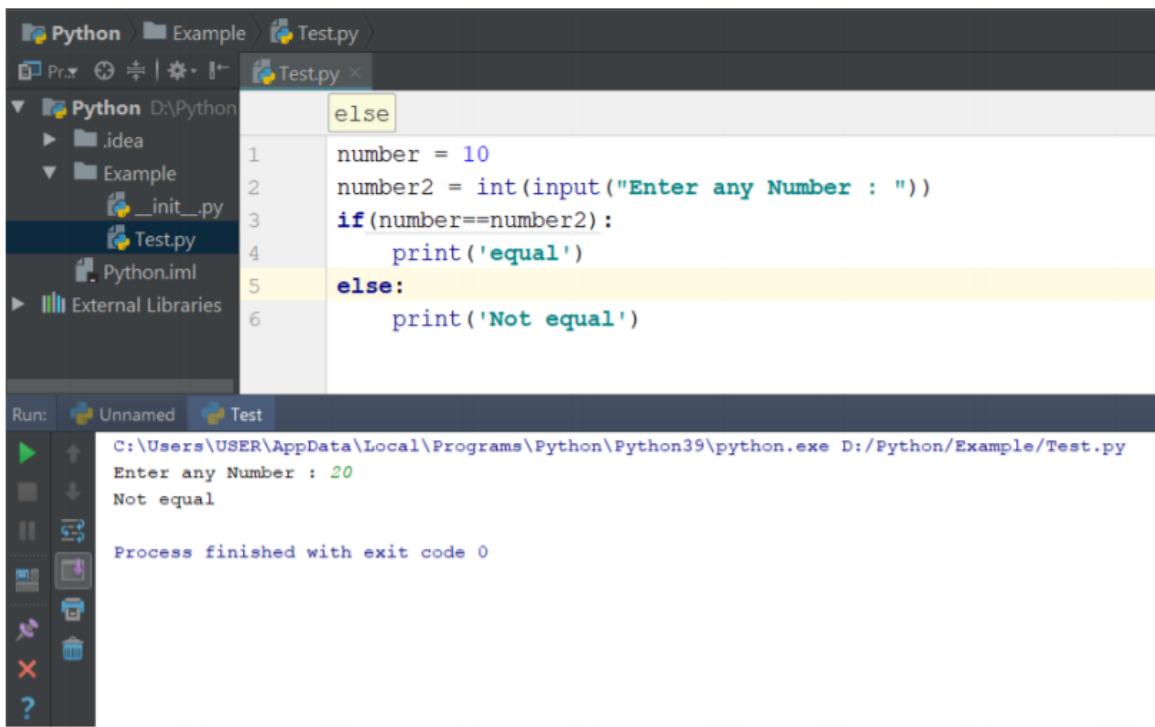
```
1 x = int(input("Enter first number : "))
2 y = int(input("Enter second number : "))
3 plus = x + y
4 print('Sum of {0} & {1} = {2}'.format(x,y,plus))
5
6 minus = x - y
7 print('MINus of {0} & {1} = {2}'.format(x,y,minus))
8
9 multiply = x*y
10 print('Multiply of {0} & {1} = {2}'.format(x,y,multiply))
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 output window shows the execution of the script:

```
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 = 1024000000000000
Divide of 20 & 10 = 2.0
FLoor of 20 & 10 = 2
Modulo of 20 & 10 = 0
```

The if statement:

Answer:



A screenshot of the PyCharm IDE interface. The left sidebar shows a project structure with a 'Python' folder containing 'Example' and 'Test.py'. The 'Test.py' file is open in the main editor. The code is as follows:

```
number = 10
number2 = int(input("Enter any Number : "))
if(number==number2):
    print('equal')
else:
    print('Not equal')
```

The 'else' block is highlighted with a yellow background. Below the editor, the 'Run' tab is selected, showing the command: C:\Users\USER\AppData\Local\Programs\Python\Python39\python.exe D:/Python/Example/Test.py. The run output shows the user input '20' and the program's response 'Not equal'. The status bar at the bottom indicates 'Process finished with exit code 0'.

The while Statement:

Answer:

The screenshot shows the PyCharm IDE interface. The left sidebar displays a project structure with a Python directory containing an .idea folder, an Example folder with __init__.py and Test.py files, and a Python.iml file. The right pane shows the code editor for Test.py:

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

The terminal at the bottom shows the output of running the script:

```
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:

The screenshot shows the PyCharm IDE interface. The top navigation bar displays the path: Python > Example > Test.py. The left sidebar shows a project structure with a Python directory containing .idea, Example (with __init__.py and Test.py), and Python.iml. The main editor window contains the following code:

```
for i in range(5):
    print(i)
```

The output window at the bottom shows the execution results:

```
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 programming 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 shows the Eclipse IDE interface with a Python project named 'Example'. The 'Testpy' file is open in the editor, displaying the following Python code:

```
for i in range(...):
    for j in b else:
        a = int(input('Enter the elements : '))
        b.append(a)
        sum = 0
        sum1 = 0
        sum2 = 0
        for j in b:
            if(j>0):
                if(j%2==0):
                    sum= sum + j
                else:
                    sum1 = sum + j
            else:
                sum2 = (sum2+j) * (-1)
        print('Sum of all positive even : ', sum)
        print('Sum of all positive odd : ', sum1)
        print('Sum of all number : ', sum2)
```

The code calculates the sum of positive even, odd, and total numbers entered by the user. The output window below 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:

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.