

MAWLANA BHASHANI SCIENCE AND TECHNOLOGY UNIVERSITY

Santosh,Tangail – 1902



Course Title : Computer Networks Lab

Lab Report Name : Introduction to Python

Lab Report No : 01

Submitted by,

Name: Md Ahadul Haque&

Ali Ashadullah Arif

ID: IT-18045 & 18031

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Dept. of ICT, MBSTU

Submitted to,

NAZRUL ISLAM

Assistant Professor

Dept. of ICT, MBSTU

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.

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.

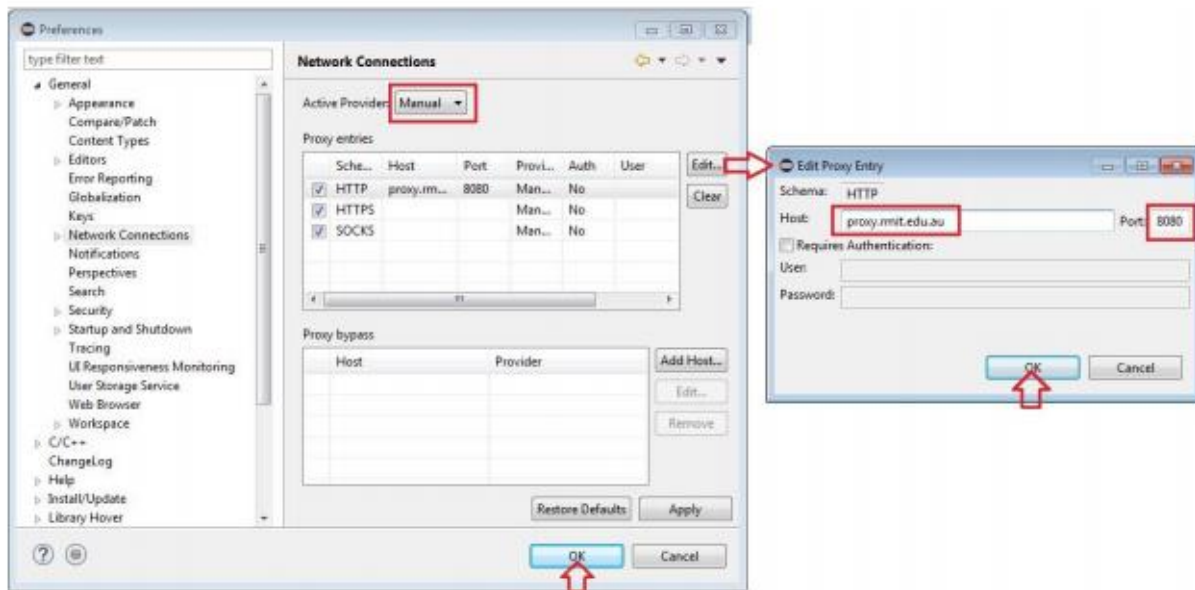


Figure 1: Eclipse Setup for Internet

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:

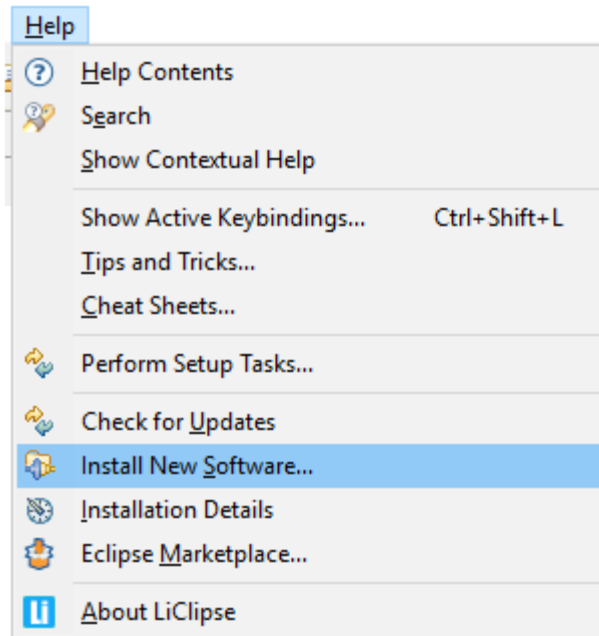


Figure 2: Setup

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

<http://www.pydev.org/updates>

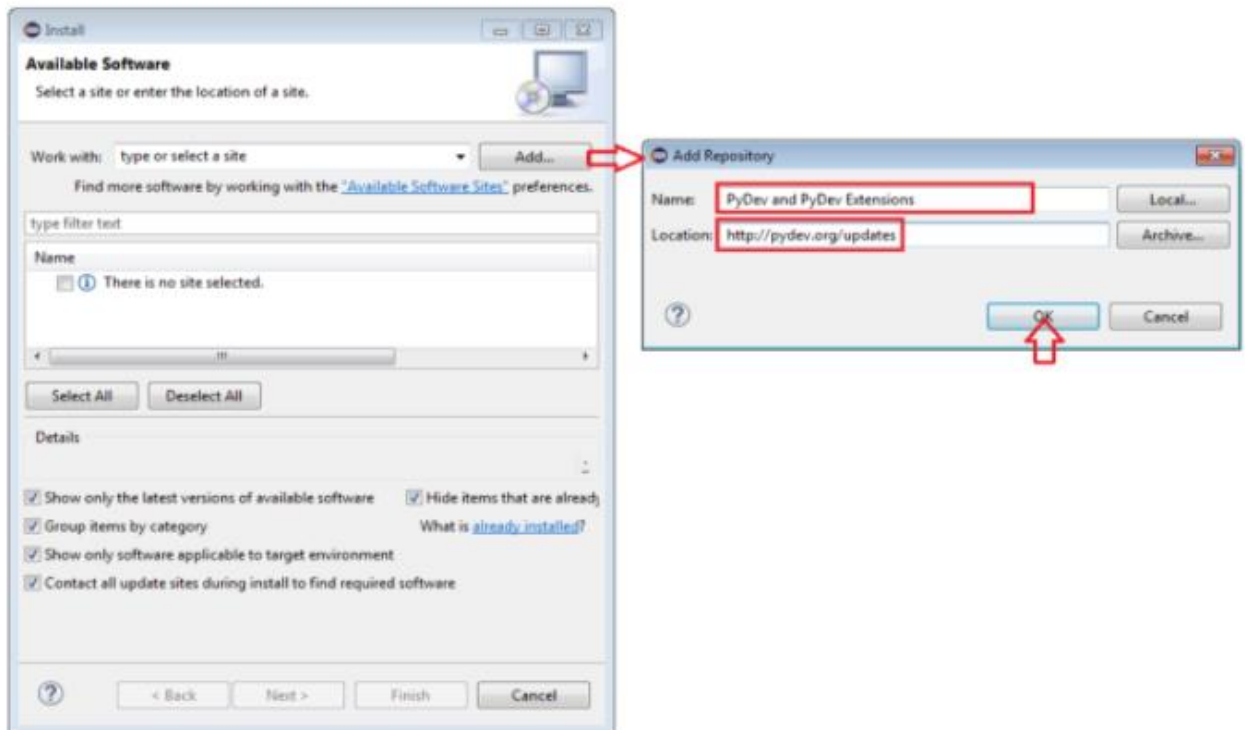


Figure 3: Setup Python on Eclipse

- 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 the figure below):

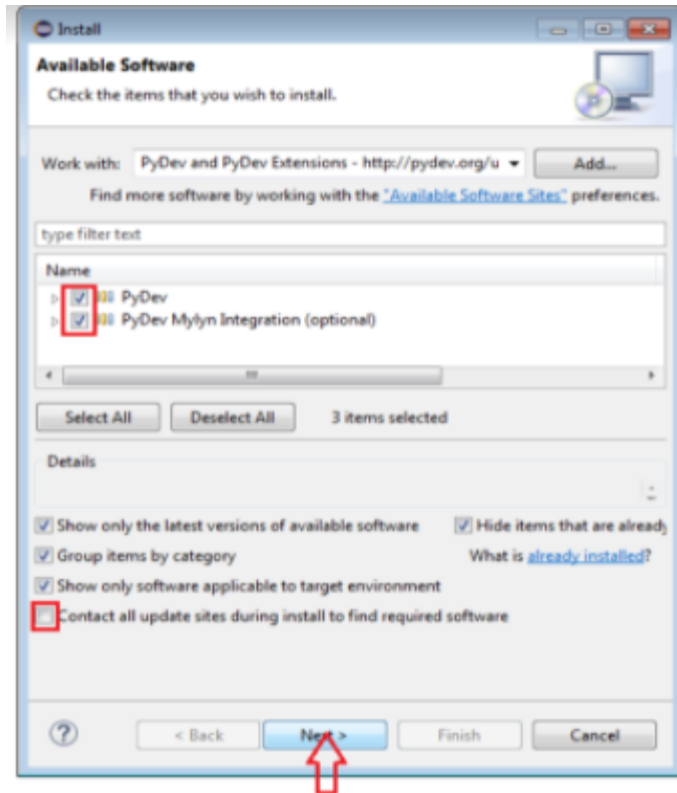


Figure 4: Setup Python on Eclipse

- d. Then, UNCHECK the 'Contact all update sites during install to find required software' and press 'NEXT' again to confirm your selection(see the figure below):

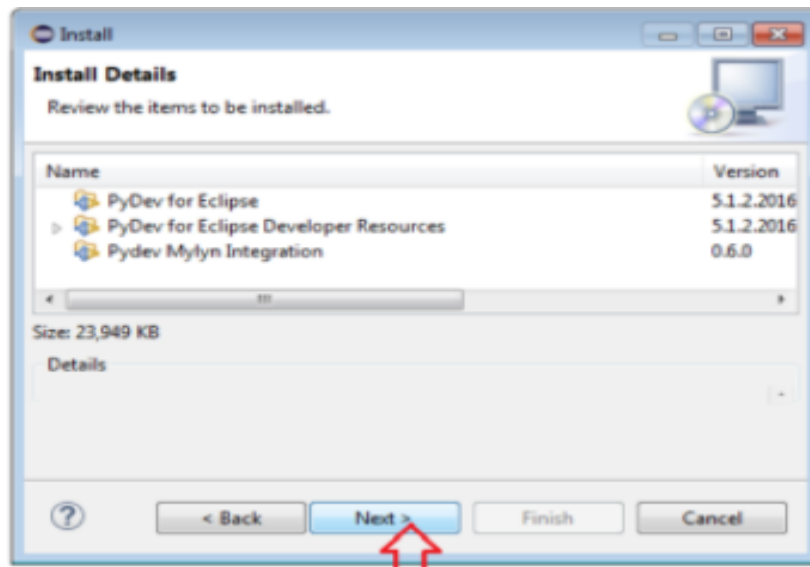


Figure 5: Setup Python on Eclipse

- e. And finally, read the license agreement if you accept, select the accept radio button and click 'Finish'(see the figure below):

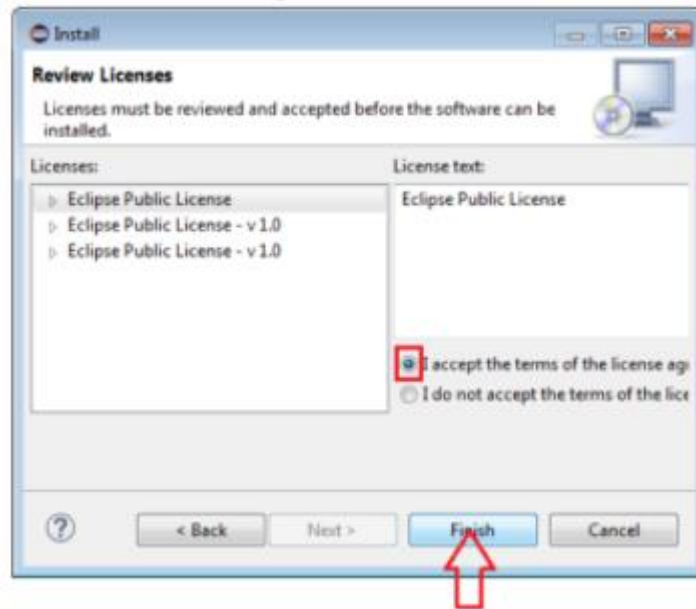
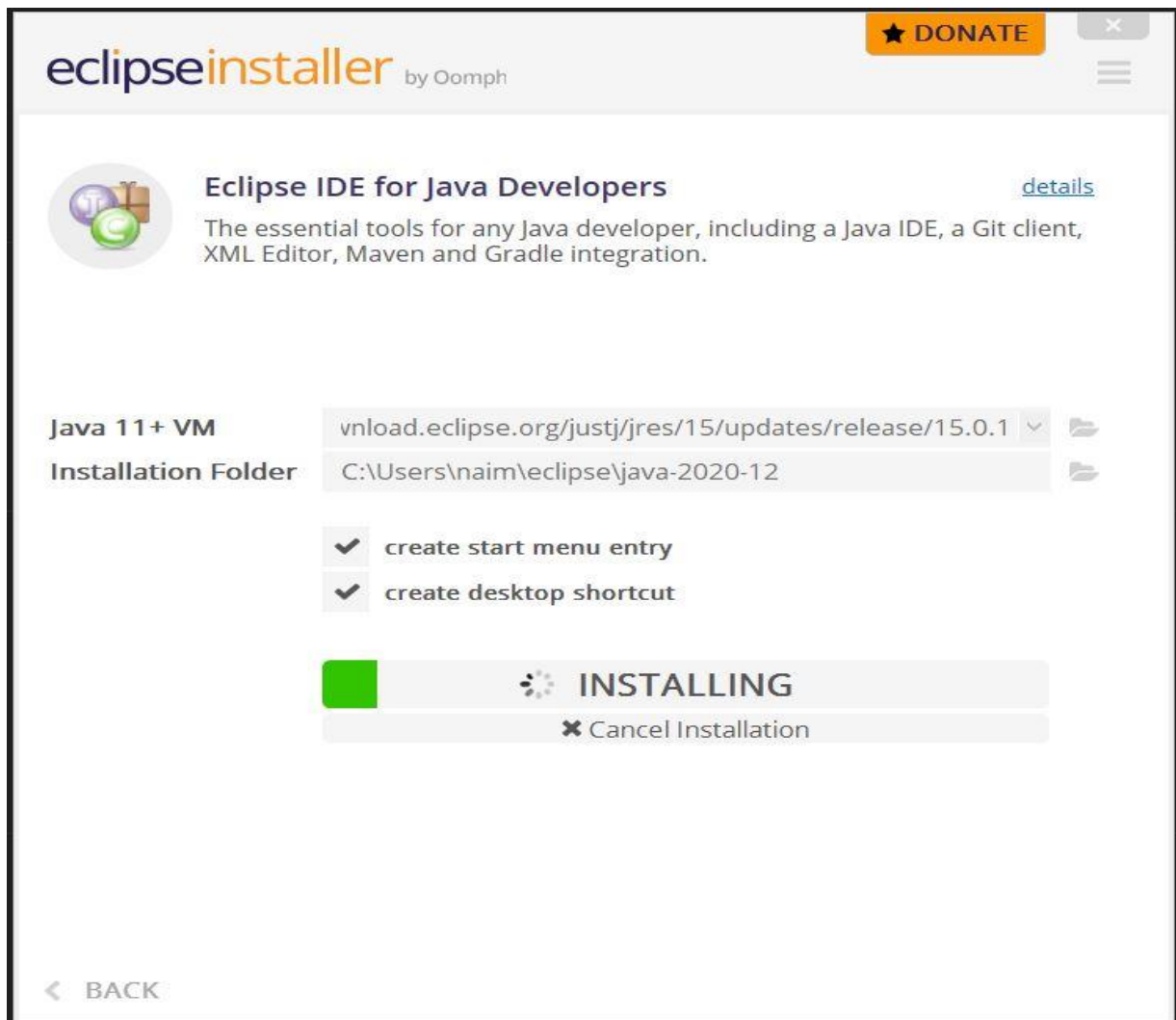
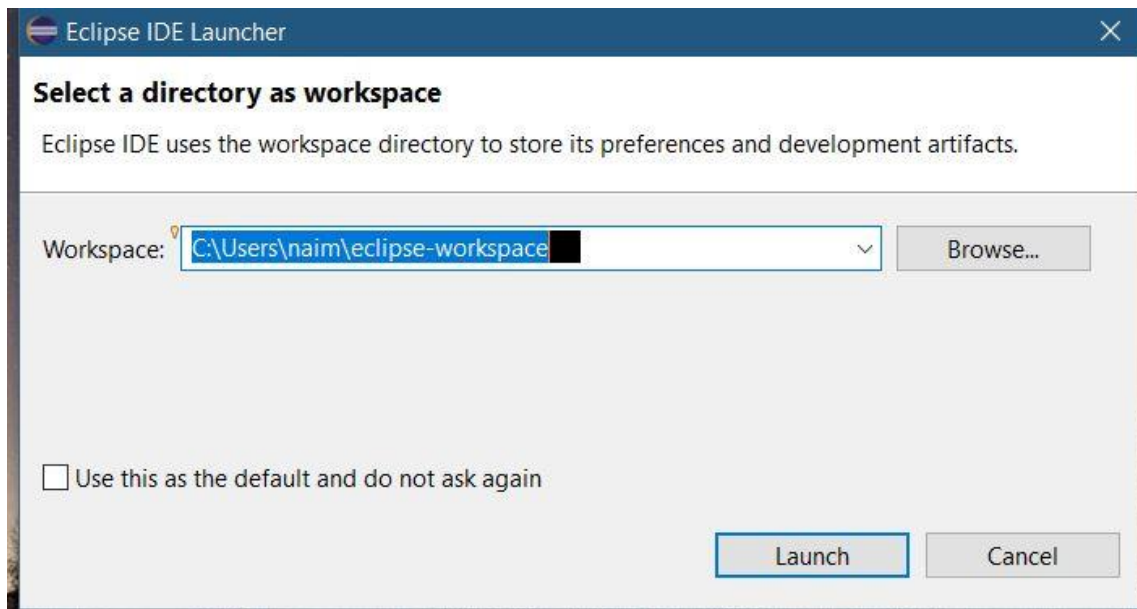


Figure 6: Setup Python on Eclipse

- f. At the point, Eclipse should automatically download the plugin contents and present you to a dialog asking if you want to restart (to which you should say **yes**).

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):

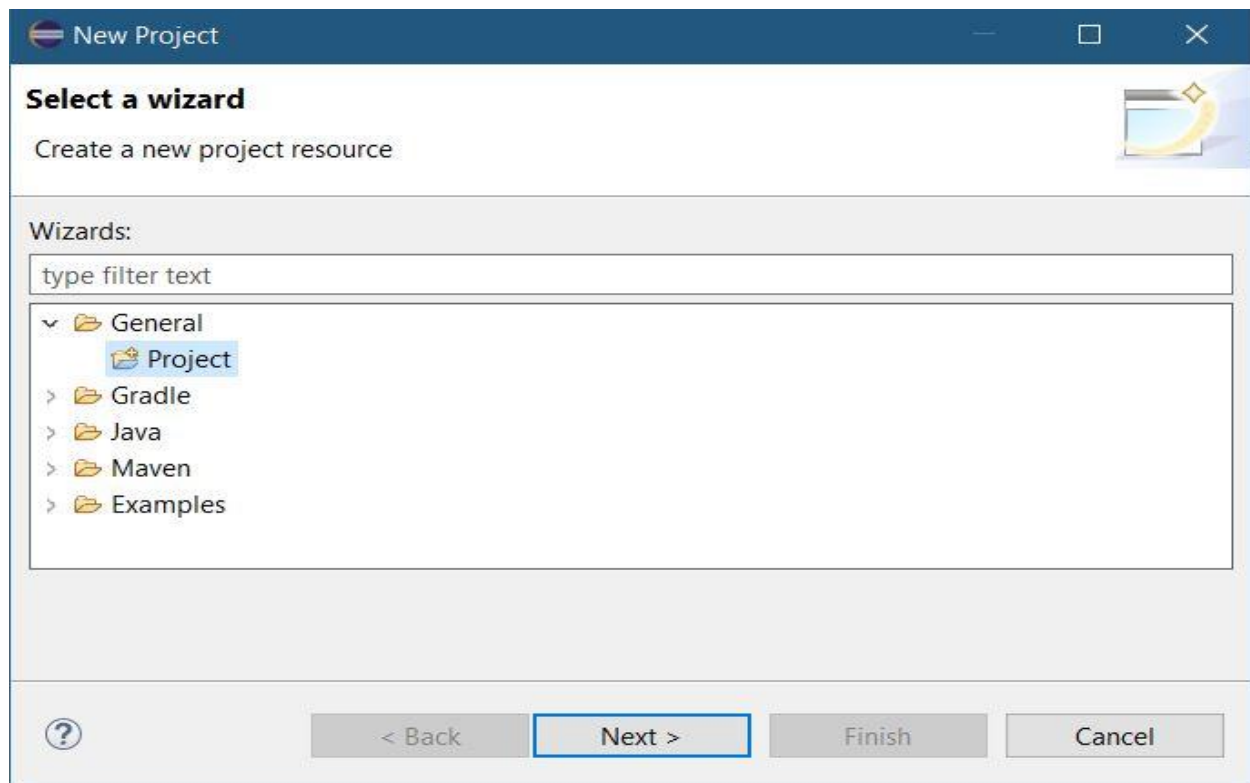


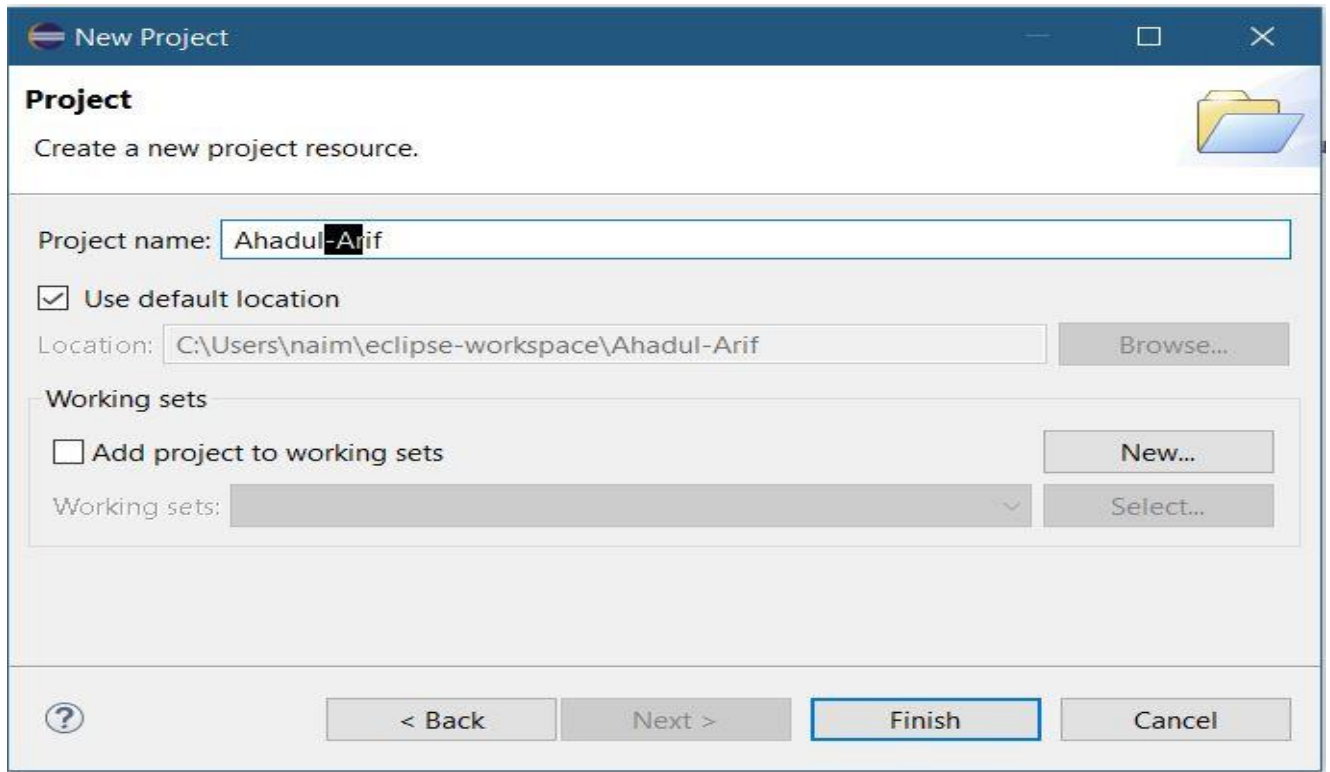
Exercises

Section 4.1: Basics of python and programing

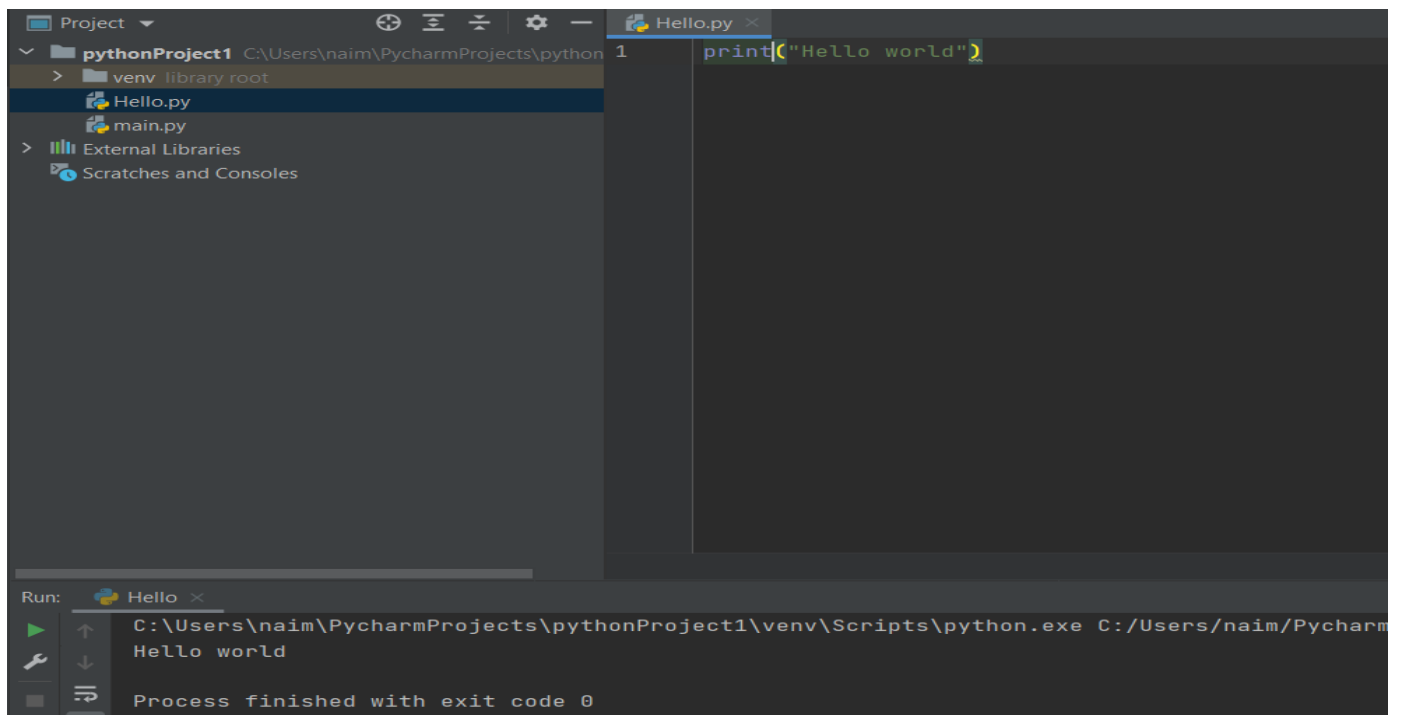
Exercise 4.1.1: Create a python project.

Answer:

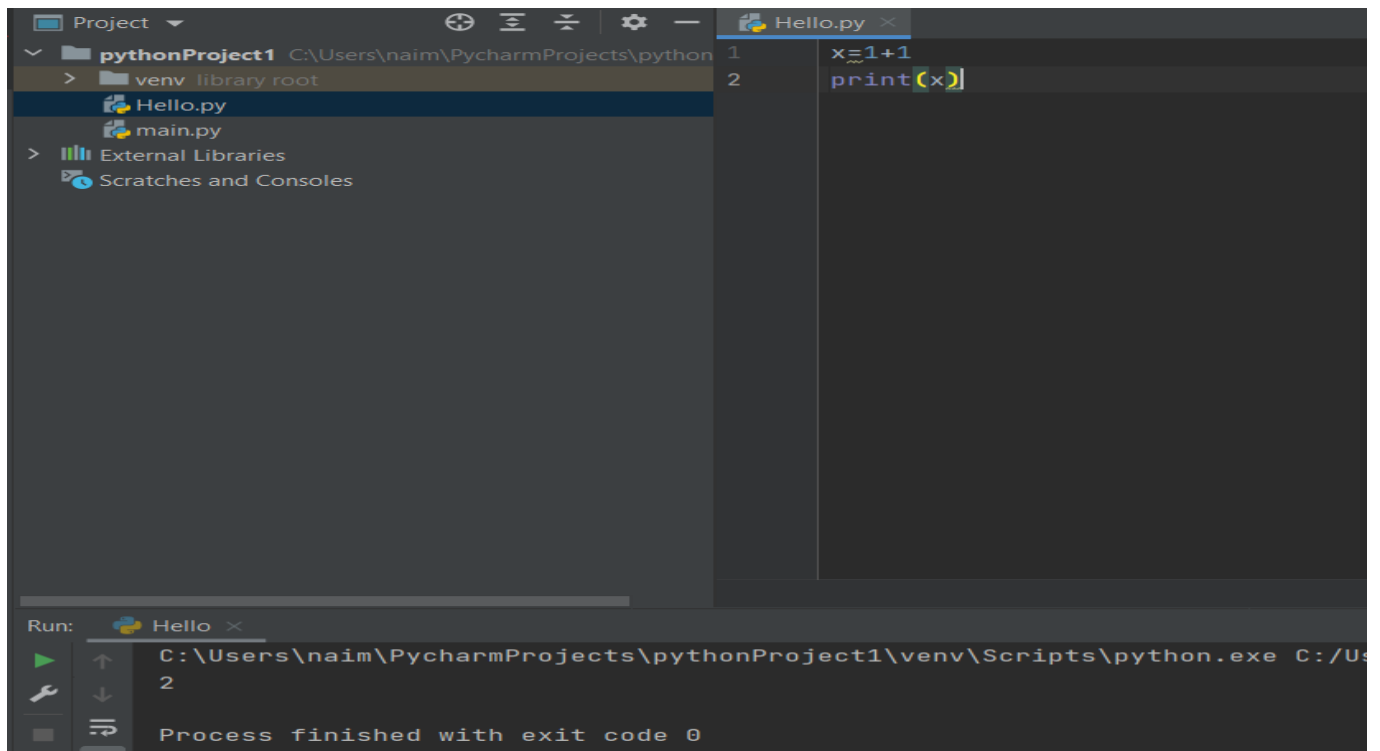




Exercise: 4.1.2 : Write a Hello World Program.



Exercise 4.1.3: Compute 1+1

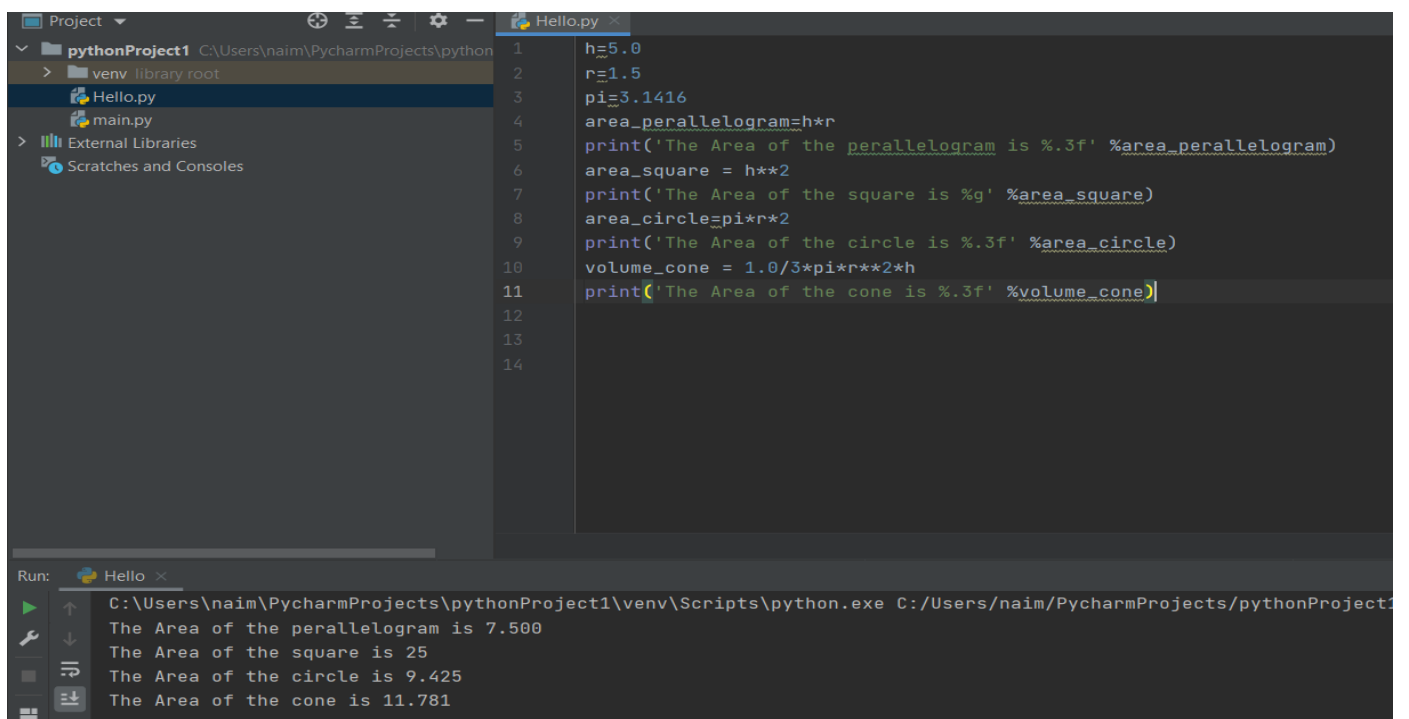


The screenshot shows the PyCharm IDE with a project named 'pythonProject1'. The file explorer on the left shows a 'venv' directory and two files: 'Hello.py' and 'main.py'. The 'Hello.py' file is open in the editor, containing two lines of code: `x=1+1` and `print(x)`. The Run window at the bottom shows the command `C:\Users\naim\PycharmProjects\pythonProject1\venv\Scripts\python.exe C:/Users/naim/PycharmProjects/pythonProject1/Hello.py` and the output `2`. The process finished with exit code 0.

```
1 x=1+1
2 print(x)
```

Run: Hello x
C:\Users\naim\PycharmProjects\pythonProject1\venv\Scripts\python.exe C:/Users/naim/PycharmProjects/pythonProject1/Hello.py
2
Process finished with exit code 0

Exercise 4.1.4: Type in program text



The screenshot shows the PyCharm IDE with the same project. The 'Hello.py' file is open, containing a more complex script. The script defines variables for height, radius, and pi, then calculates the area of a parallelogram, a square, a circle, and the volume of a cone. The Run window shows the output of the script.

```
1 h=5.0
2 r=1.5
3 pi=3.1416
4 area_perallelogram=h*r
5 print('The Area of the perallelogram is %.3f' %area_perallelogram)
6 area_square = h**2
7 print('The Area of the square is %g' %area_square)
8 area_circle=pi*r**2
9 print('The Area of the circle is %.3f' %area_circle)
10 volume_cone = 1.0/3*pi*r**2*h
11 print('The Area of the cone is %.3f' %volume_cone)
```

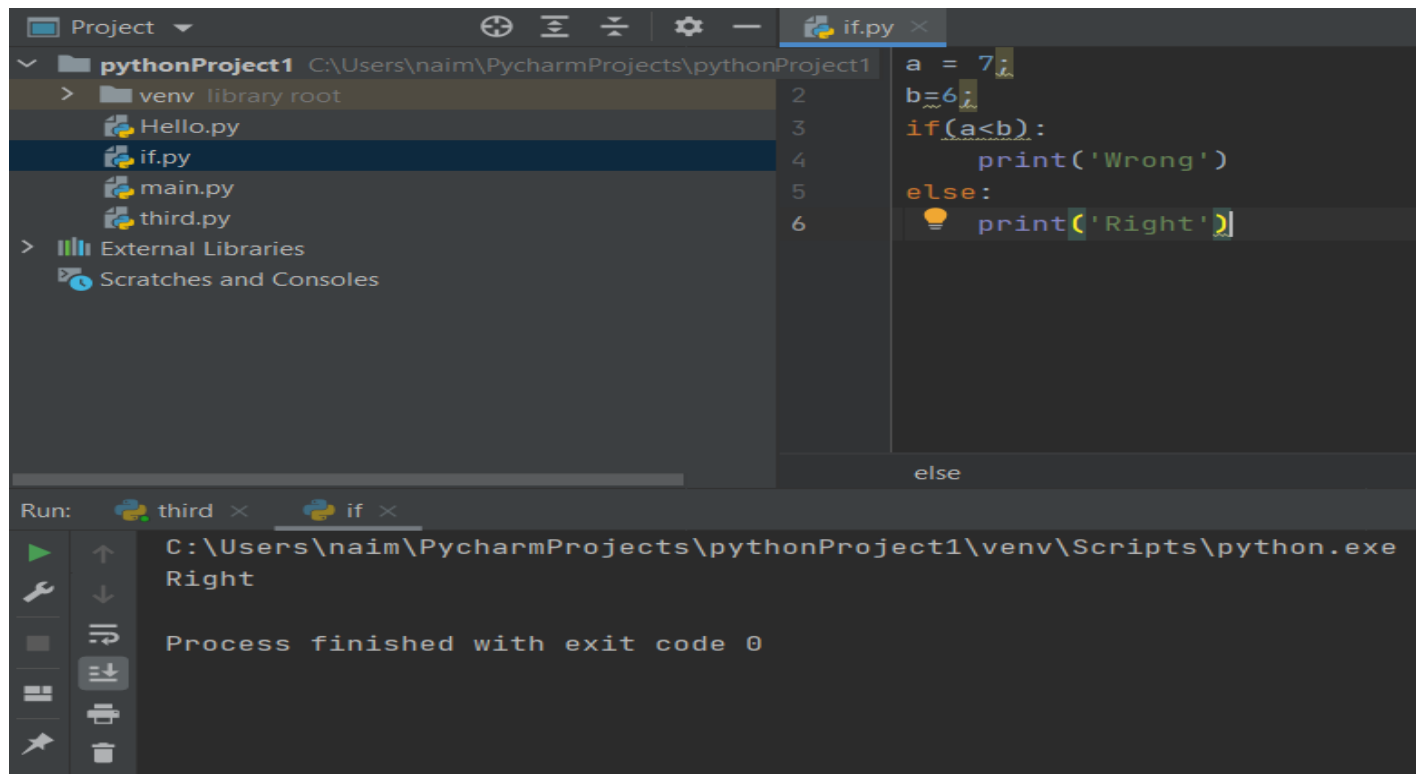
Run: Hello x
C:\Users\naim\PycharmProjects\pythonProject1\venv\Scripts\python.exe C:/Users/naim/PycharmProjects/pythonProject1/Hello.py
The Area of the perallelogram is 7.500
The Area of the square is 25
The Area of the circle is 9.425
The Area of the cone is 11.781

Section 4.1: Create and run basic example.

pythonProject1	C:\Users\naim\PycharmProjects\python	1	x=int(input())
venv	library root	2	y=int(input())
Hello.py		3	print(x+y)
main.py		4	print(x-y)
third.py		5	print(x*y)
External Libraries		6	print(x/y)
Scratches and Consoles		7	print(x**y)
		8	print(x//y)
		9	print(x<y)
		10	print(x>y)
		11	print(x!=y)

```
C:\Users\naim\PycharmProjects\pythonProject1\venv\Scripts\python.exe
5
6
11
-1
30
0.8333333333333334
15625
0
True
False
True
```

Exercise 4.2.2: The if statement:



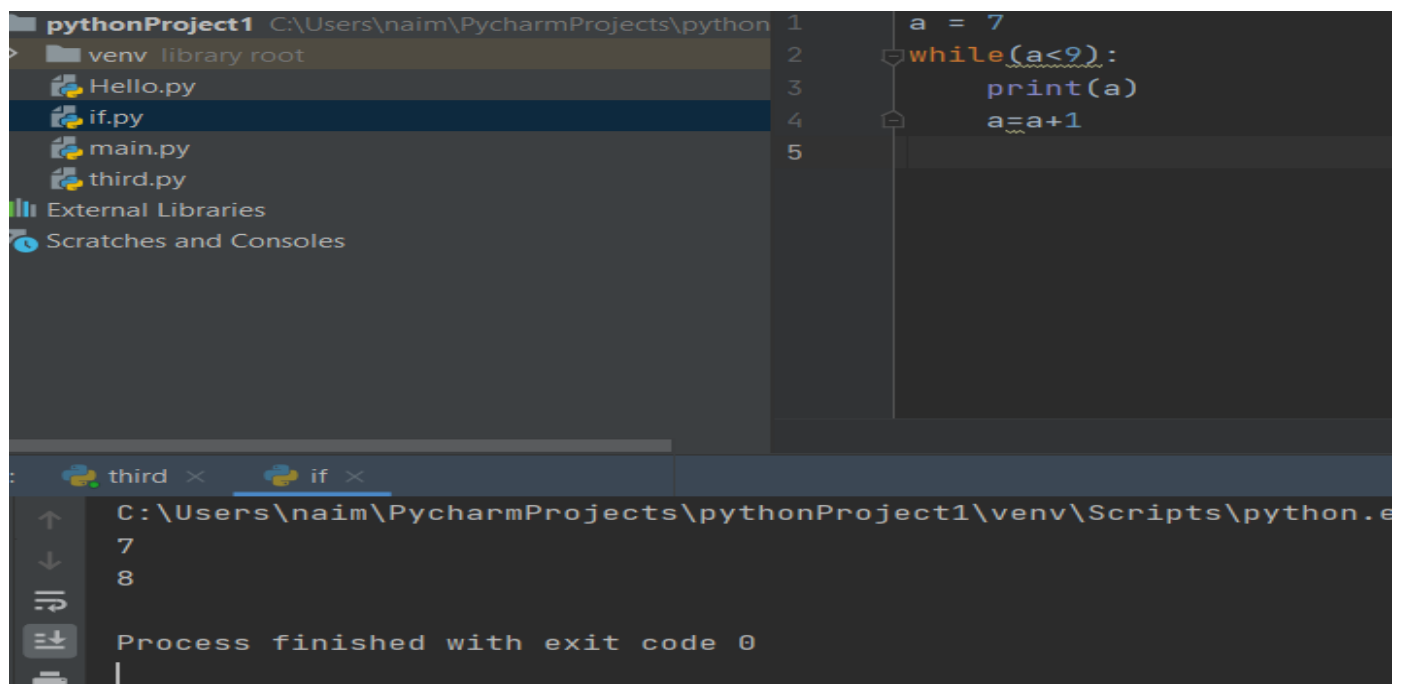
The screenshot shows the PyCharm IDE with a project named 'pythonProject1'. The file explorer on the left shows a 'venv' directory and several Python files: 'Hello.py', 'if.py', 'main.py', and 'third.py'. The 'if.py' file is open in the editor, showing the following code:

```
1 a = 7;
2 b=6;
3 if(a<b):
4     print('Wrong')
5 else:
6     print('Right')
```

The code is executed, and the Run window at the bottom shows the output:

```
C:\Users\naim\PycharmProjects\pythonProject1\venv\Scripts\python.exe
Right
Process finished with exit code 0
```

Exercise 4.2.3: The while Statement



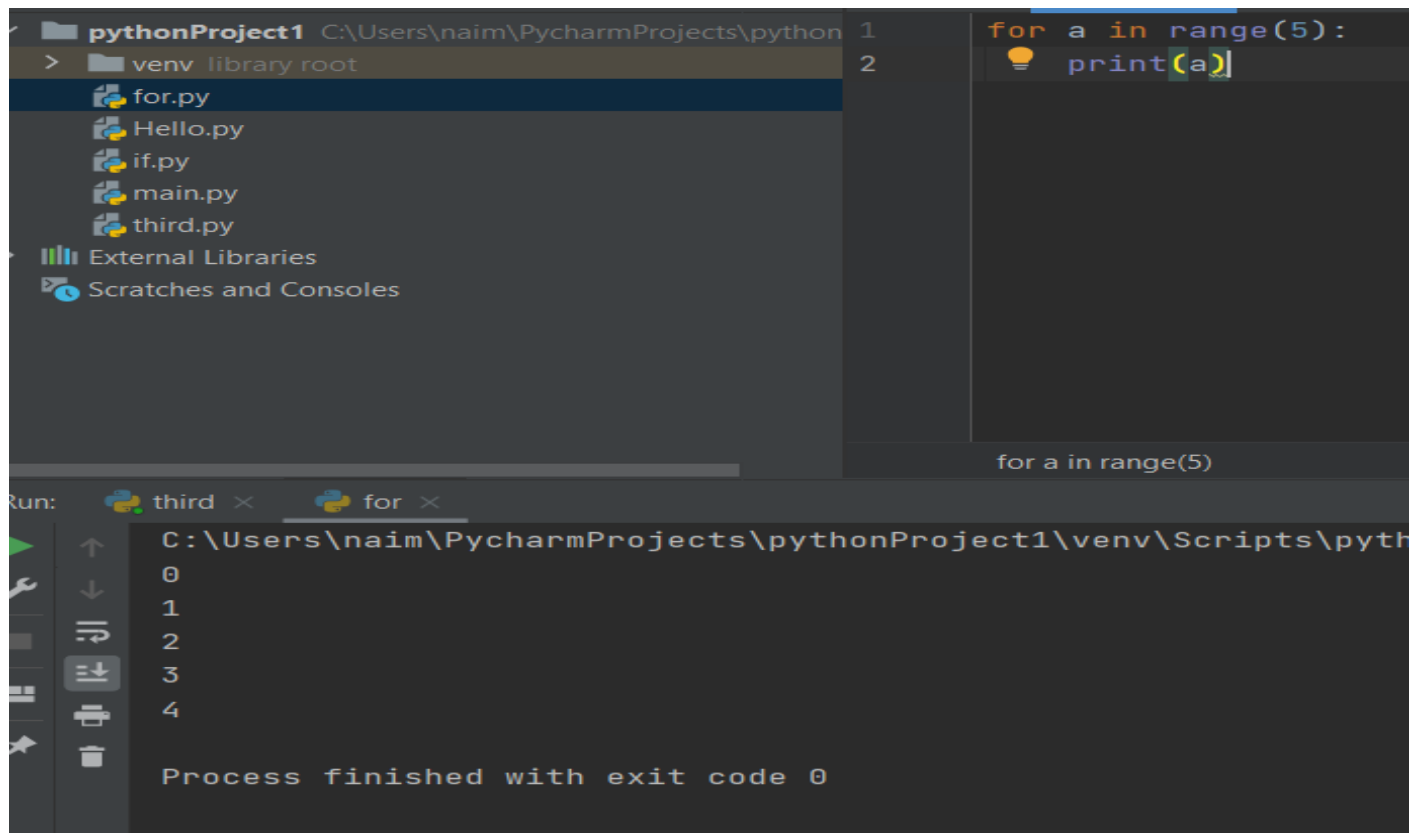
The screenshot shows the PyCharm IDE with the same project 'pythonProject1'. The file explorer on the left shows the same files as the previous screenshot. The 'if.py' file is open in the editor, showing the following code:

```
1 a = 7
2 while(a<9):
3     print(a)
4     a=a+1
5
```

The code is executed, and the Run window at the bottom shows the output:

```
C:\Users\naim\PycharmProjects\pythonProject1\venv\Scripts\python.exe
7
8
Process finished with exit code 0
```

Exercise 4.2.4: The for Statement



The screenshot shows the PyCharm IDE interface. On the left, the Project Explorer displays a file tree for 'pythonProject1' with files: 'for.py', 'Hello.py', 'if.py', 'main.py', and 'third.py'. The 'for.py' file is selected. The main editor window shows the following Python code:

```
1 for a in range(5):  
2     print(a)
```

Below the editor, the Run window is open, showing the execution of 'for.py'. The output is:

```
0  
1  
2  
3  
4  
  
Process finished with exit code 0
```

Conclusion: 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, that's something you definitely want.

Python is widely used, including by a number of big companies like Google, Pinterest, Instagram, Disney, Yahoo!, Nokia, IBM, and many others. The Raspberry Pi – which is a mini computer and DIY lover's dream – relies on Python as it's main programming language too. You're probably wondering why either of these things matter, and that's because once you learn Python, you'll never have a shortage of ways to utilize the skill. Not to mention, since a lot of big companies rely on the language, you can make good money as a Python developer.