

Lab 1 - Getting Started with Python I

Chapter	1. Introduction to Computers, Programs, and Python
Time	80 Minutes

Lab 1

Objectives

- To learn how to setup the programming environment.
- To familiarize with the programming environment.
- To write simple programs.

Current Lab Learning Outcomes (LLO)

By completion of the lab the students should be able to

- Explain how to download and install Python.
- Explain how to download and install PyCharm.
- Use the programming environment (PyCharm).
- Write a first Python program.
- Use *print* function.

Lab Requirements

- PyCharm (IDE).

Installation Guide (5 minutes)

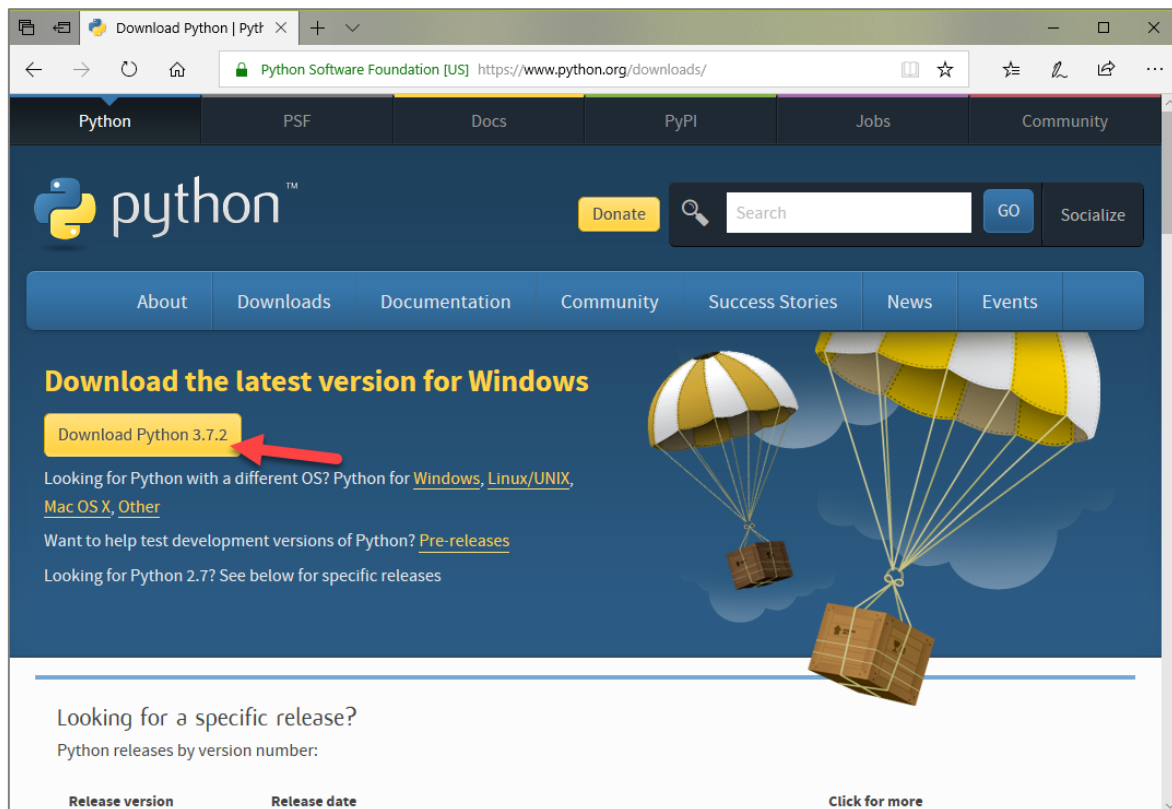
Installing Python



You need first to install Python interpreter (Python 3) on your computer to be able to run Python programs.

The following are instructions to download and install Python interpreter:

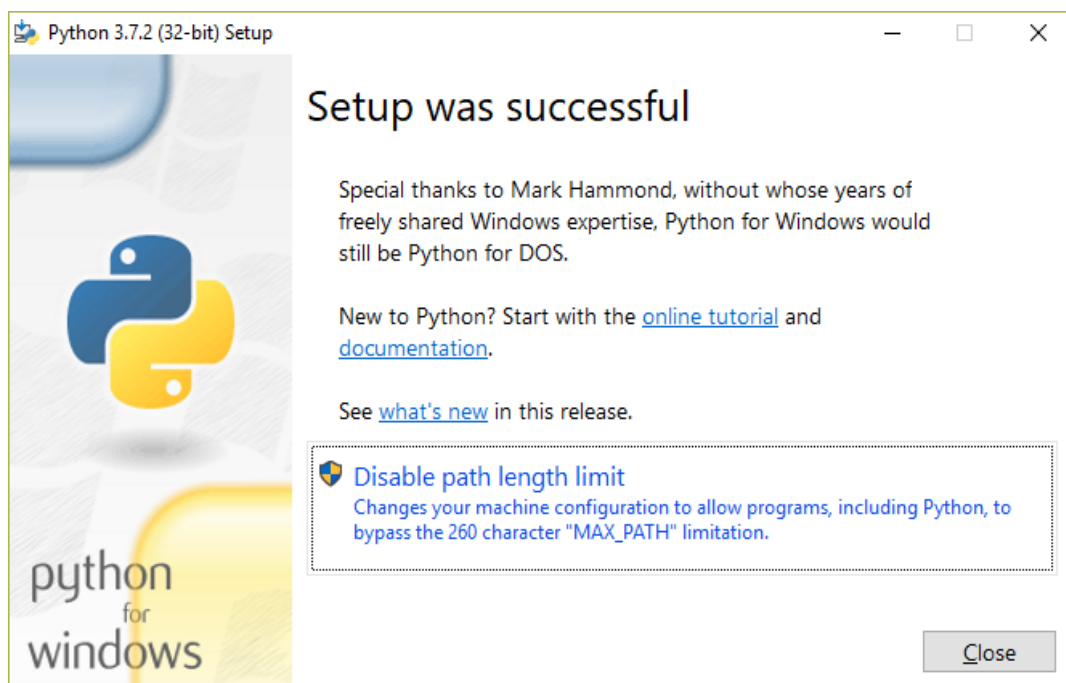
1. Go to www.python.org/downloads/ and download the last version of Python 3.7.x for your operating system.



2. After the download is finished, double click on the file to run the installer. Then, check all checkboxes and click on the “Install Now” button.



3. After the installation process completed, a new window shows up. Click on the "Disable path length limit" button if it exists. Then, click on the "close" button.



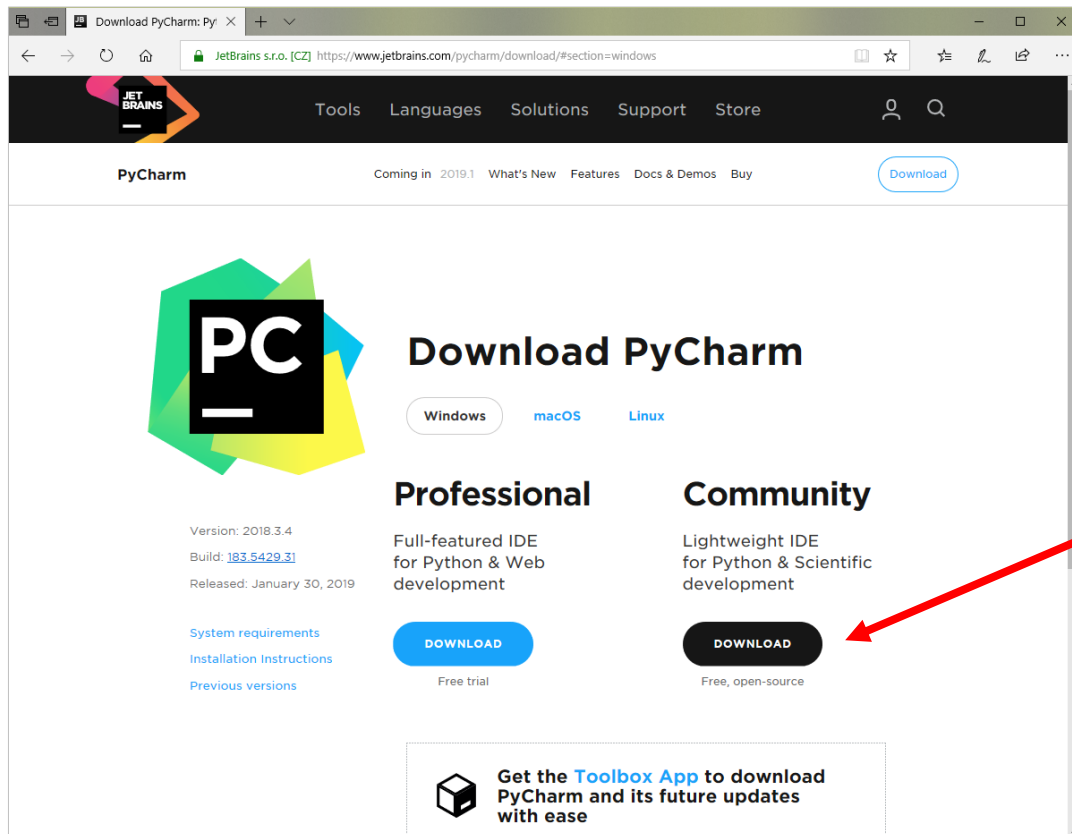
Installing PyCharm



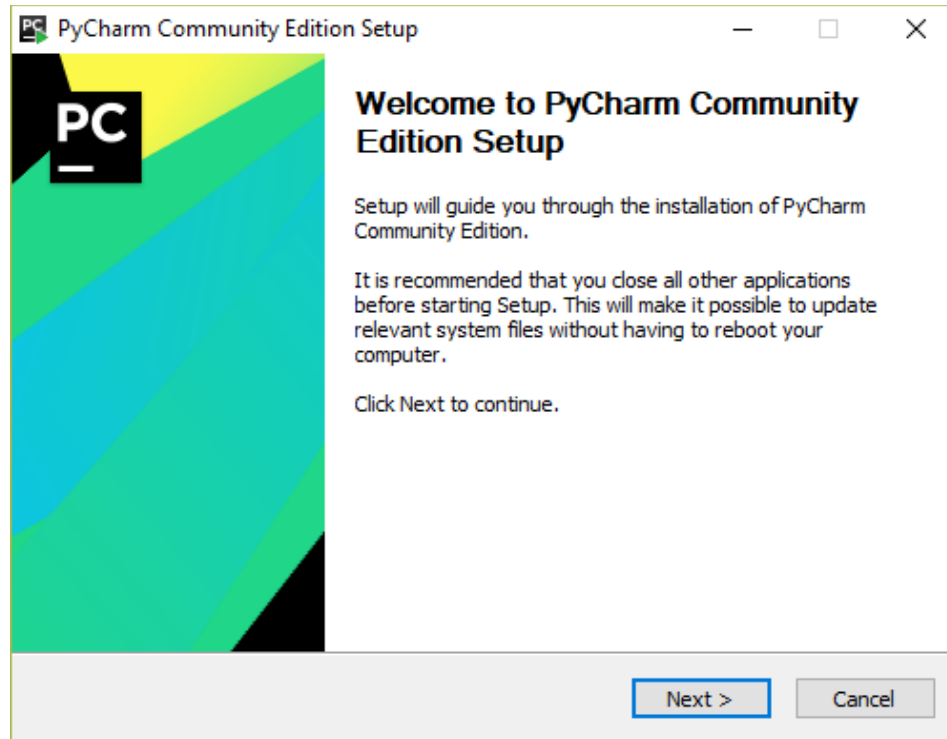
An integrated development environment (IDE) is an application that provides comprehensive facilities to programmers for software development. For Python programmers, PyCharm is one of the best IDE for Python. Also, it has a free version called “Community Edition”.

The following are instructions to download and install Python interpreter:

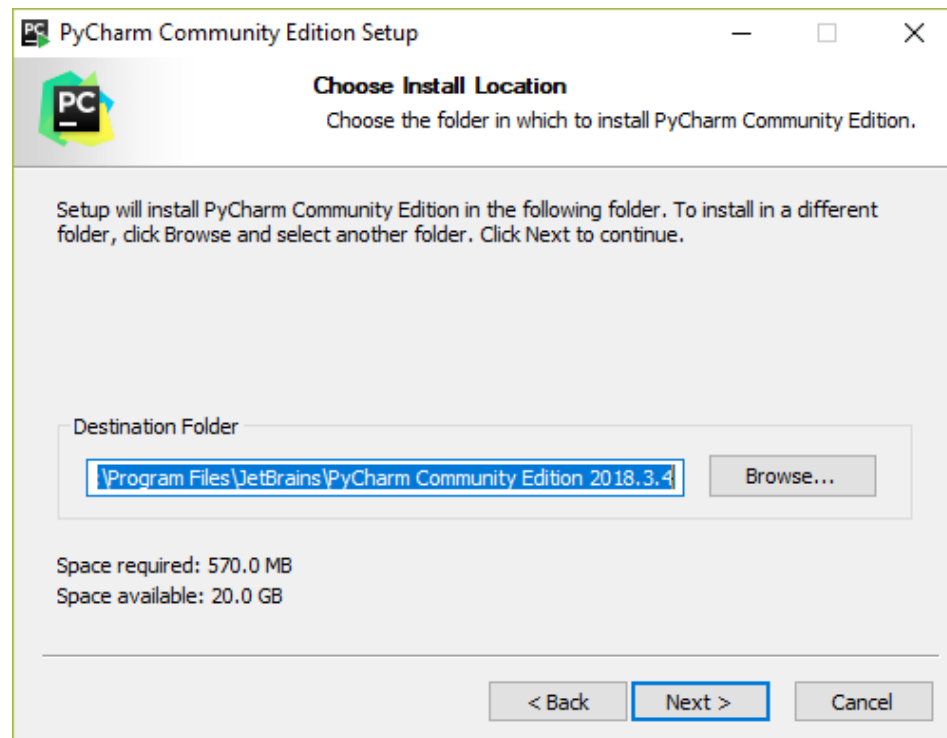
1. Go to <https://www.jetbrains.com/pycharm/download/> and then download “Community” version.



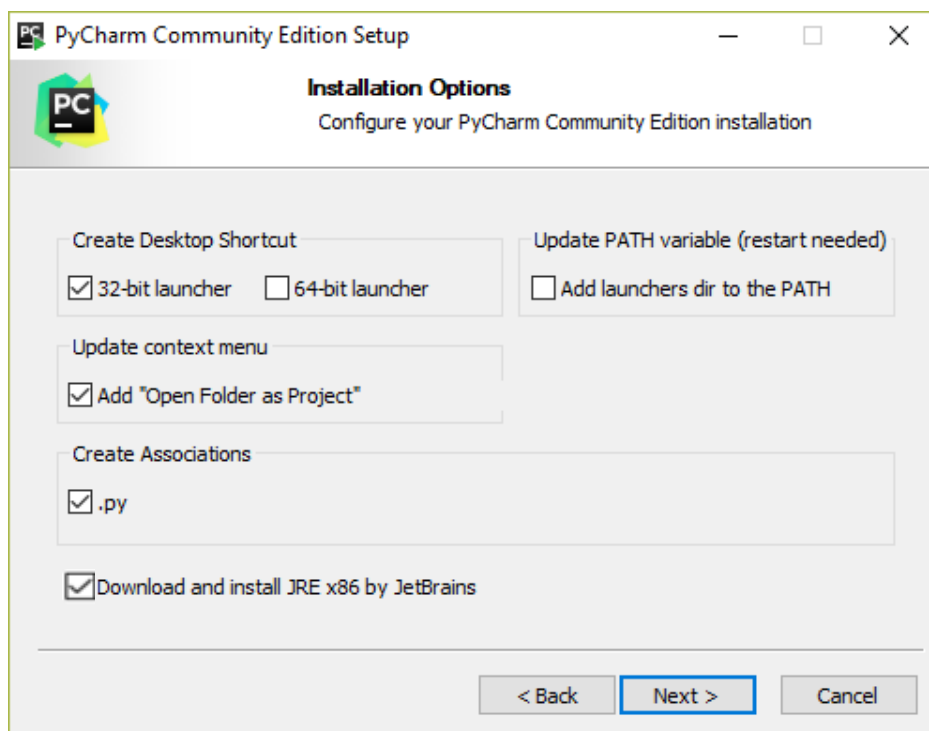
2. After the download is finished, double click on the file to run the installer. Then, click on “Next >”.



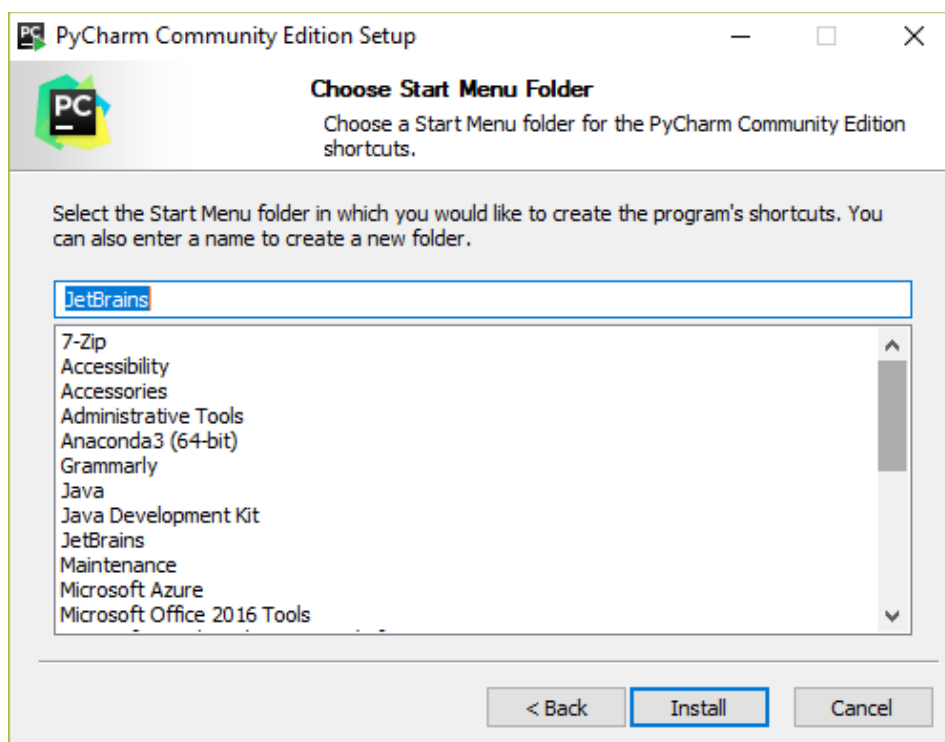
3. Then, click on "Next >".



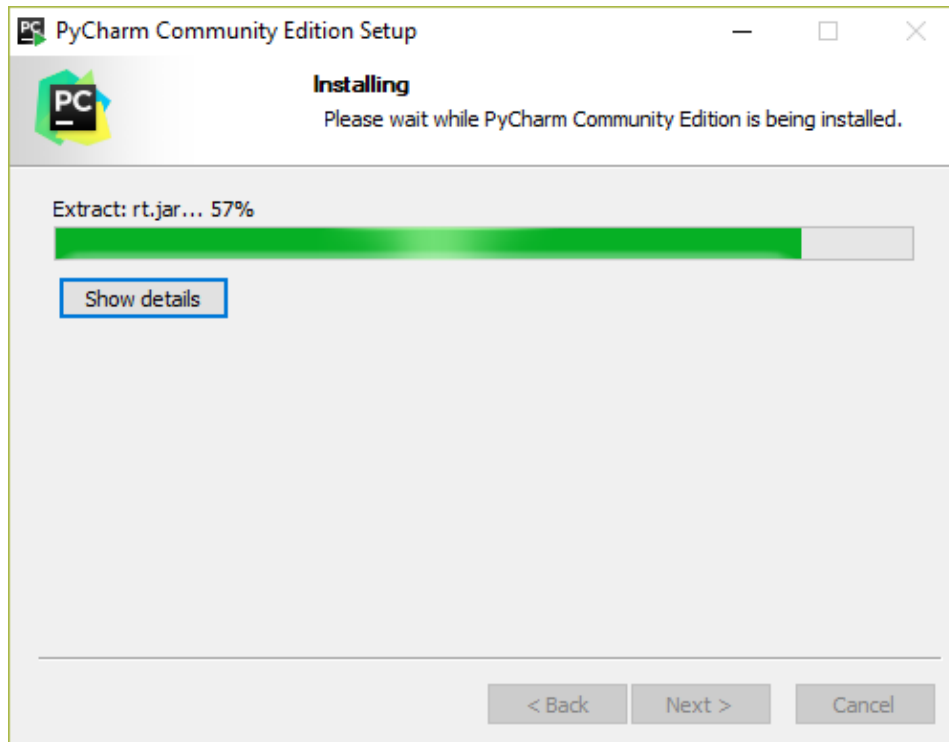
4. Then, check the checkboxes as shown the following figure and click on “Next >”.



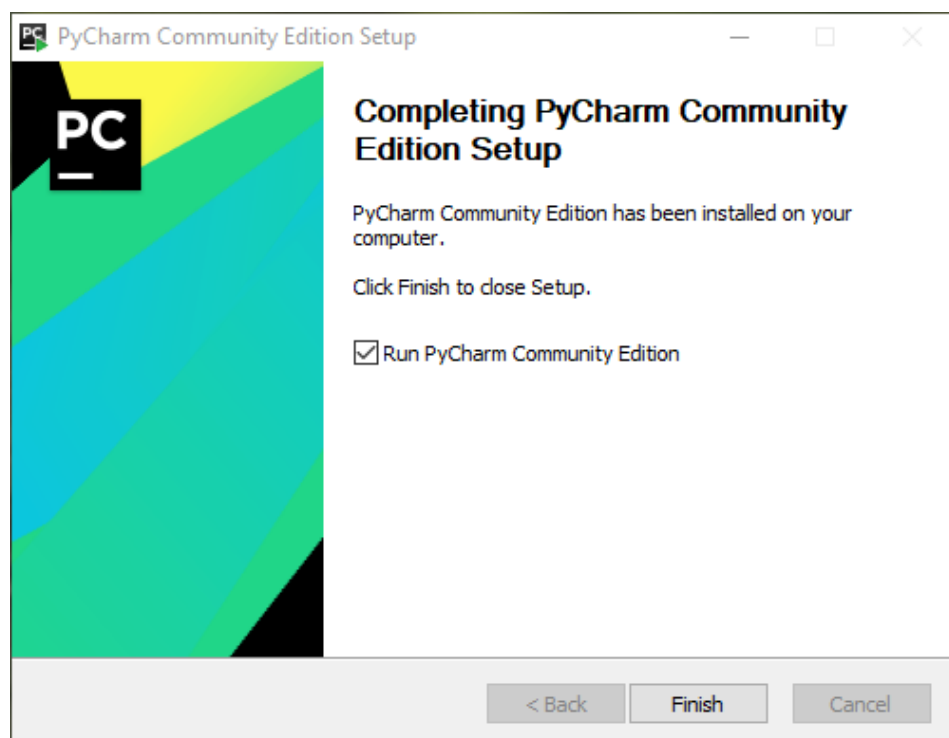
5. Then, click on “Next >”.



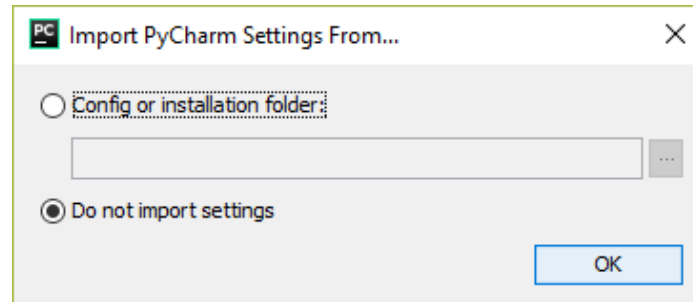
6. Then, wait until the installation process is finished.



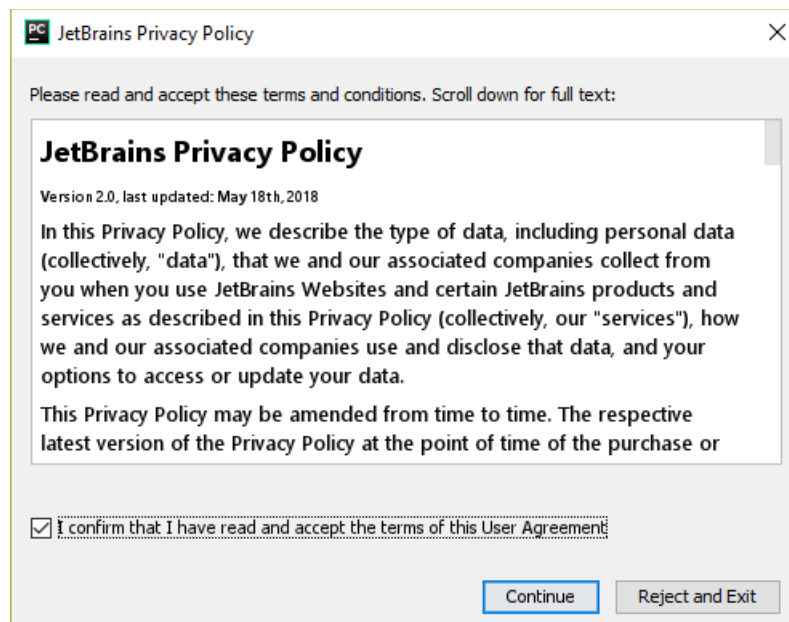
7. After that, PyCharm is ready to run. Check the checkbox and click "Finish".



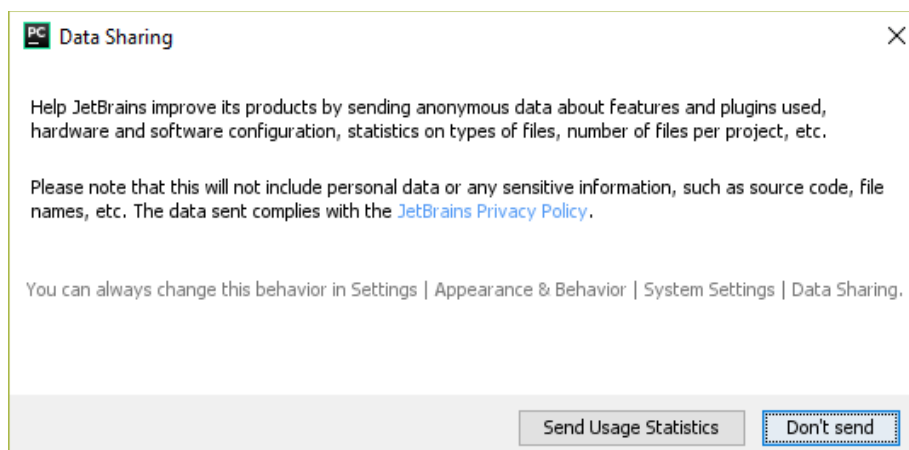
8. Then, the program is going to start. For the first time, it will ask you to setup some configurations. On the first one, check on *“Do not import settings”* and click on *“OK”*.



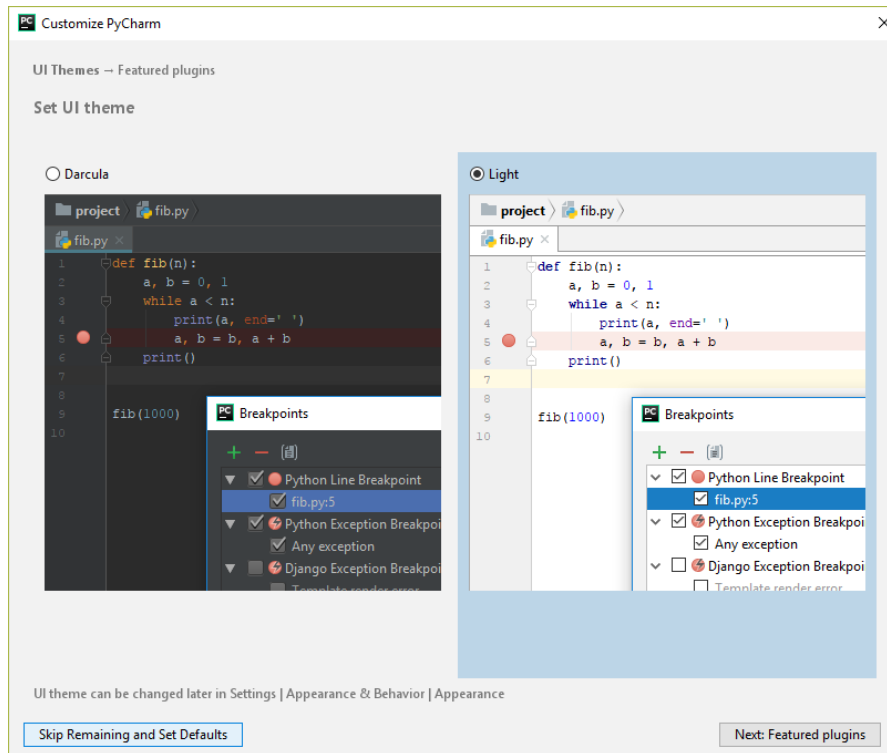
9. Then, check the checkbox and click on *“Continue”*.



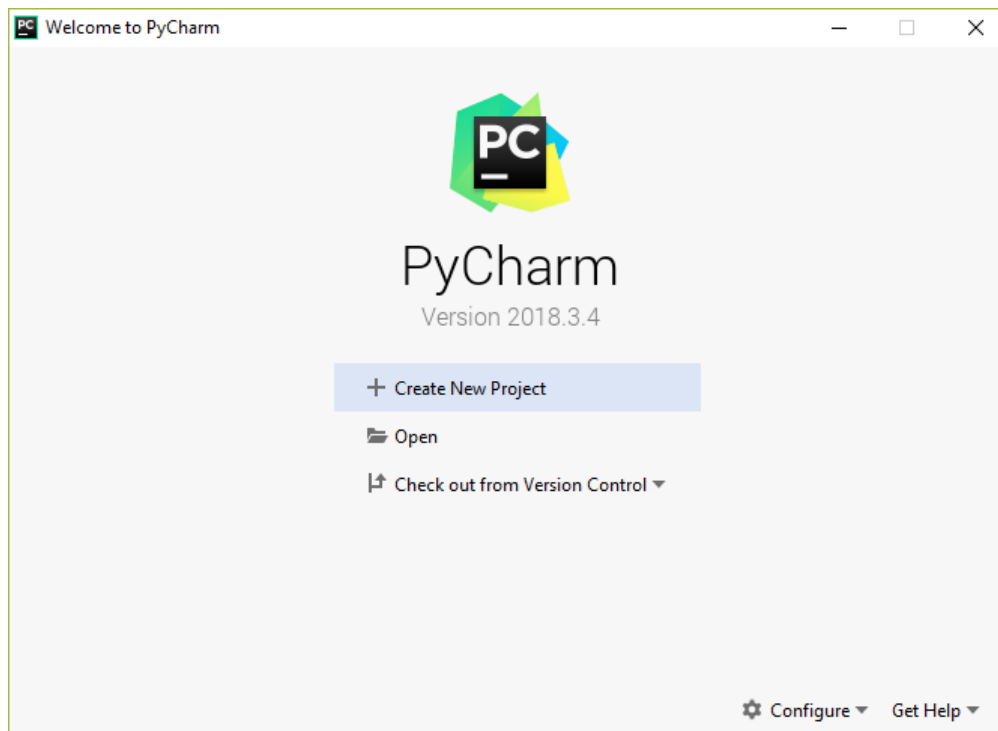
10. Then, click on *“Don't send”*.



11. Then, select the theme you want and click on “Skip Remaining and Set Defaults”.



12. After that, PyCharm is ready to use.





Practice Activities with Lab Instructor (25 minutes)

Problem 1

Programming Exercises (1.1)

Write a program that prints “Welcome to Python” and “Python is fun”. The output should be as the following:



```
Welcome to Python
Python is fun
```

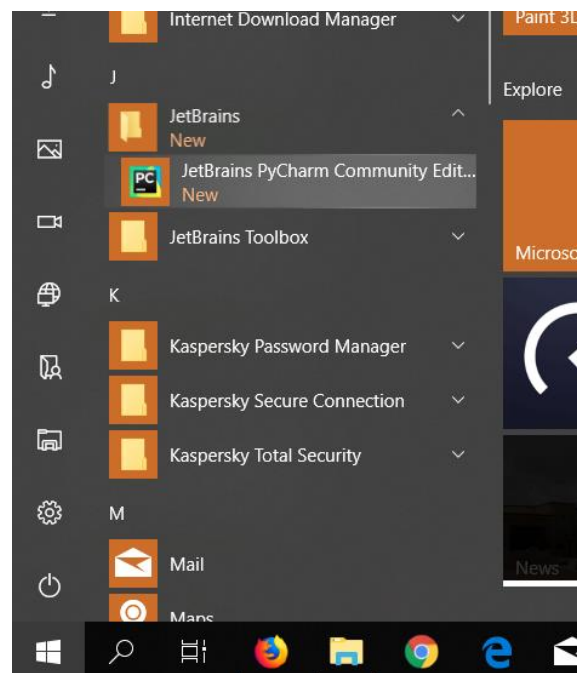
Solution

Phase 1: Problem-Solving Phase:

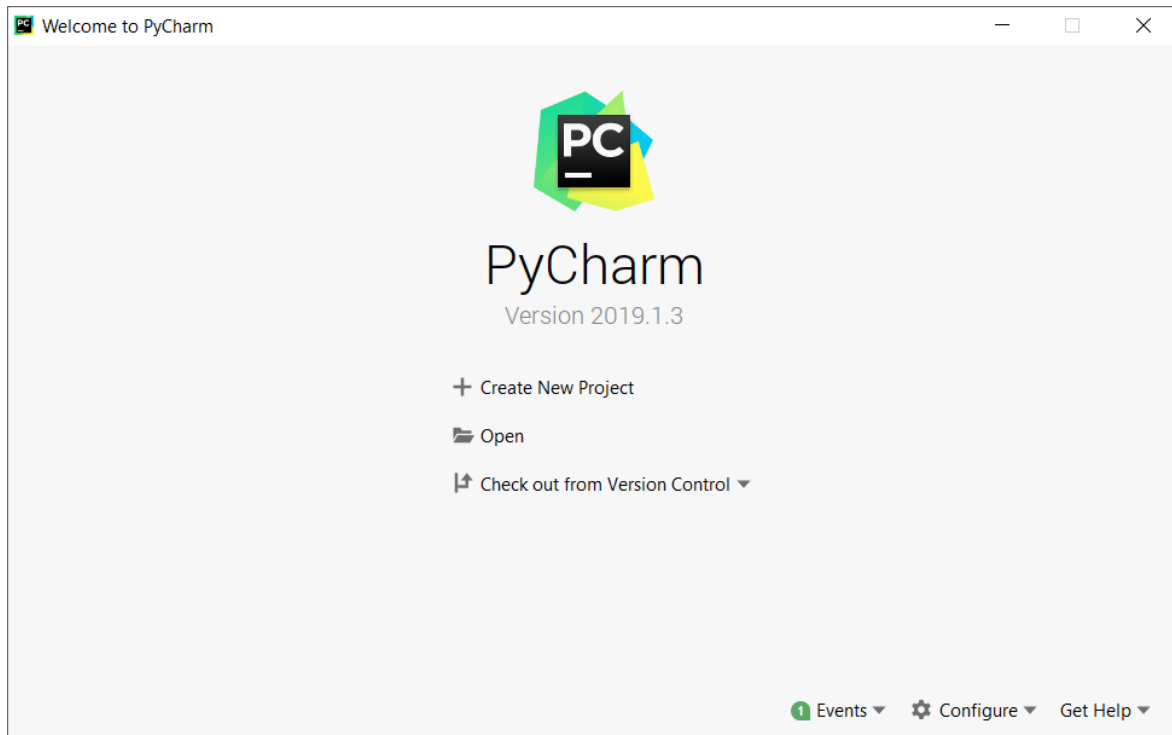
- 1- Print the first message “Welcome to Python”.
 - You can use the `print` function to output (print) a string (message).
 - `print("Welcome to Python")`
- 2- Print the second message “Python is fun”.
 - `print("Python is fun")`

Phase 2: Implementation Phase:

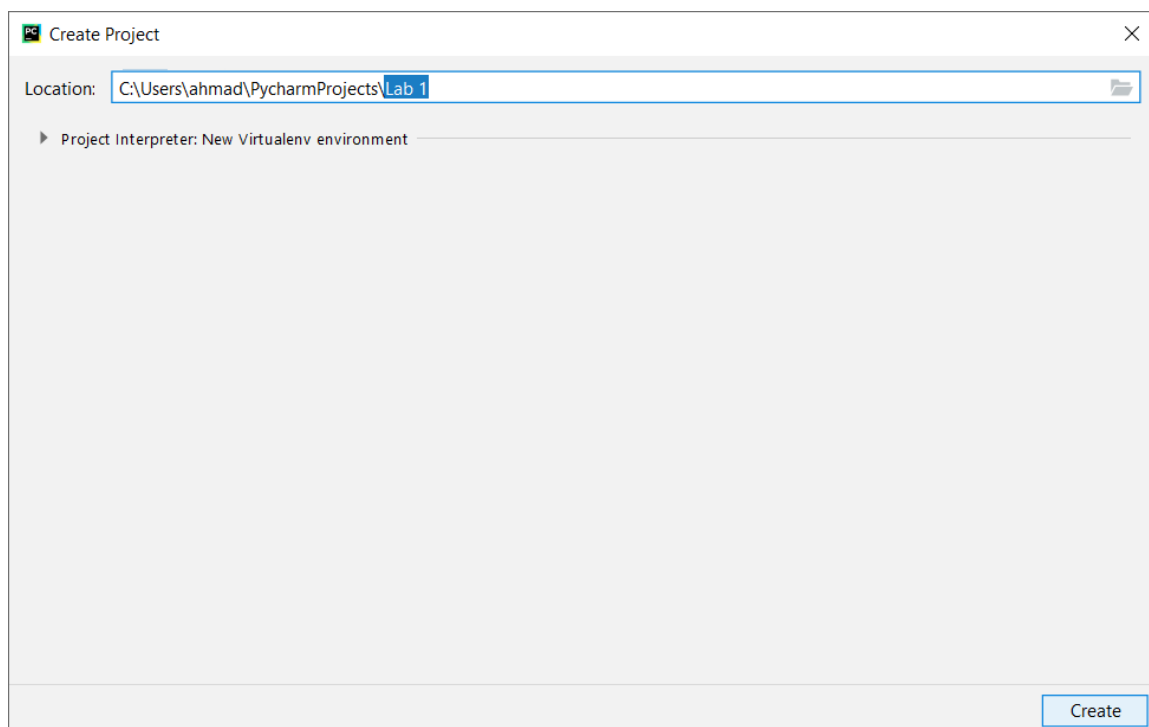
1. Open PyCharm.



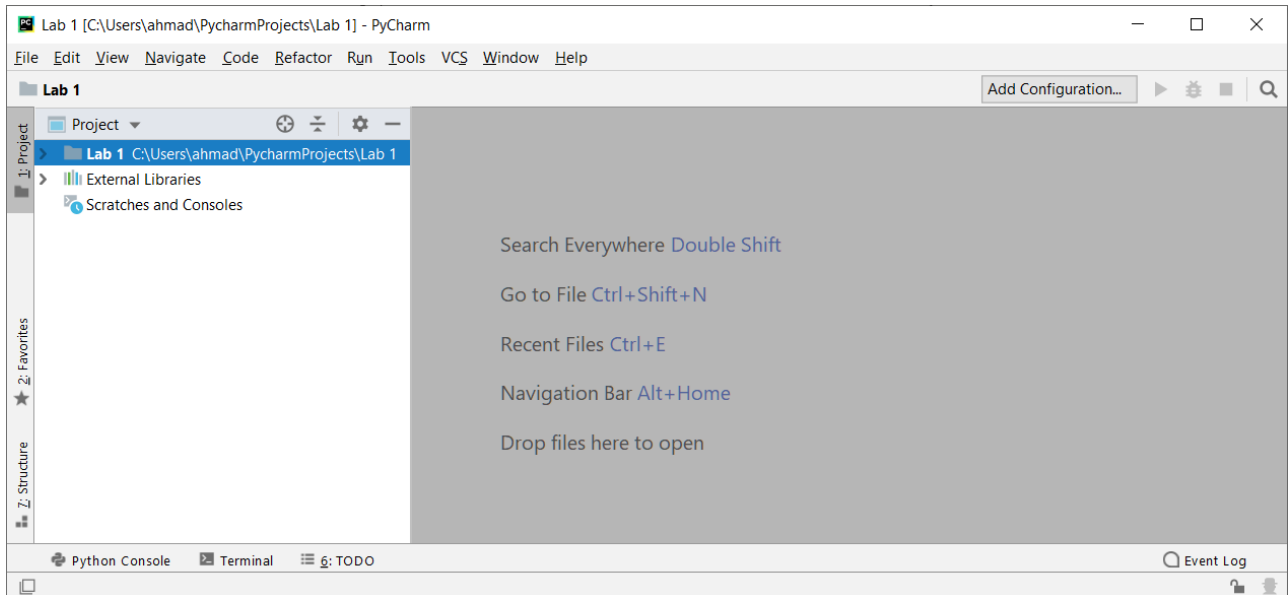
2. Then, click on “Create New Project”.



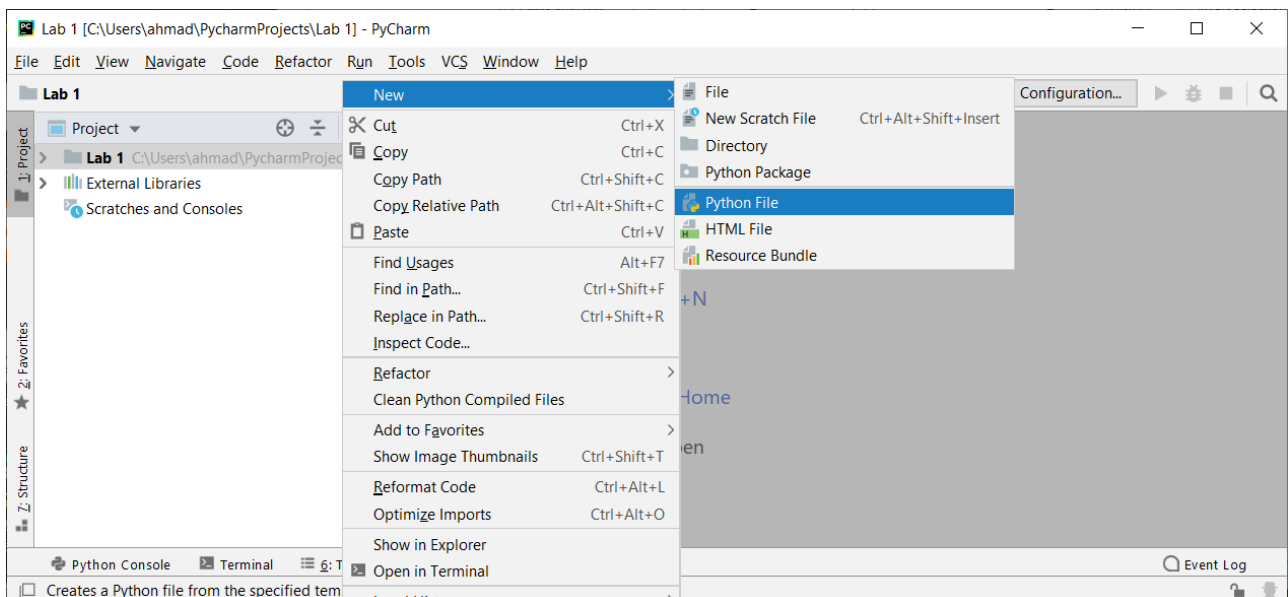
3. Then, name it “Lab 1”.



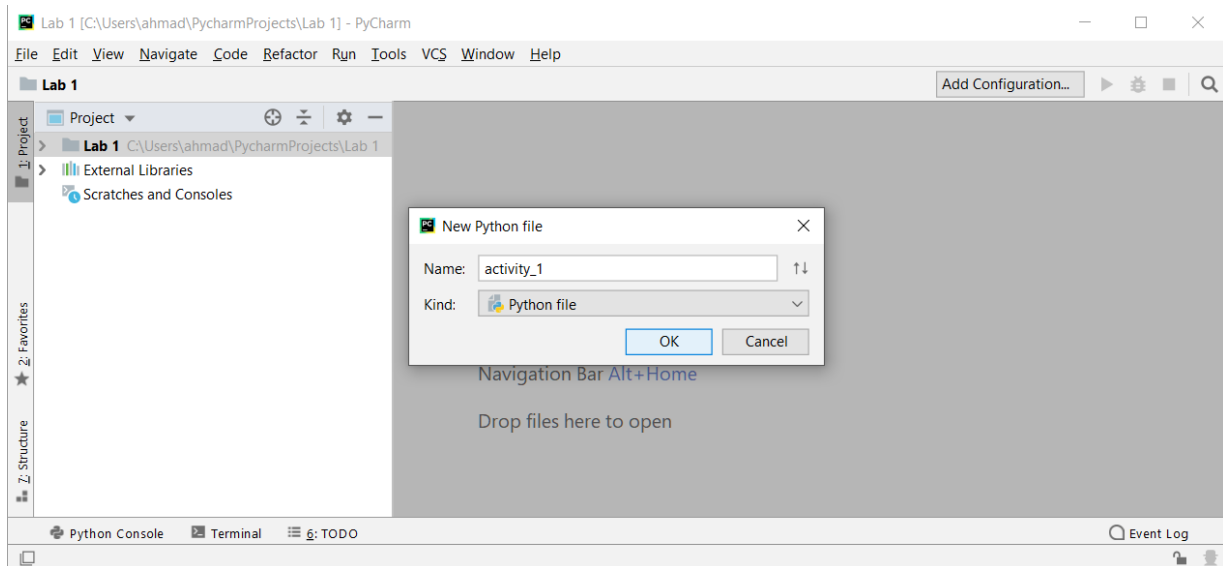
- Then, the new project is created and opened. After that, you have to create a new Python file inside the project to write the code on it.



- Select the project name on the left menu, right click on it and select “New” → “Python File”.



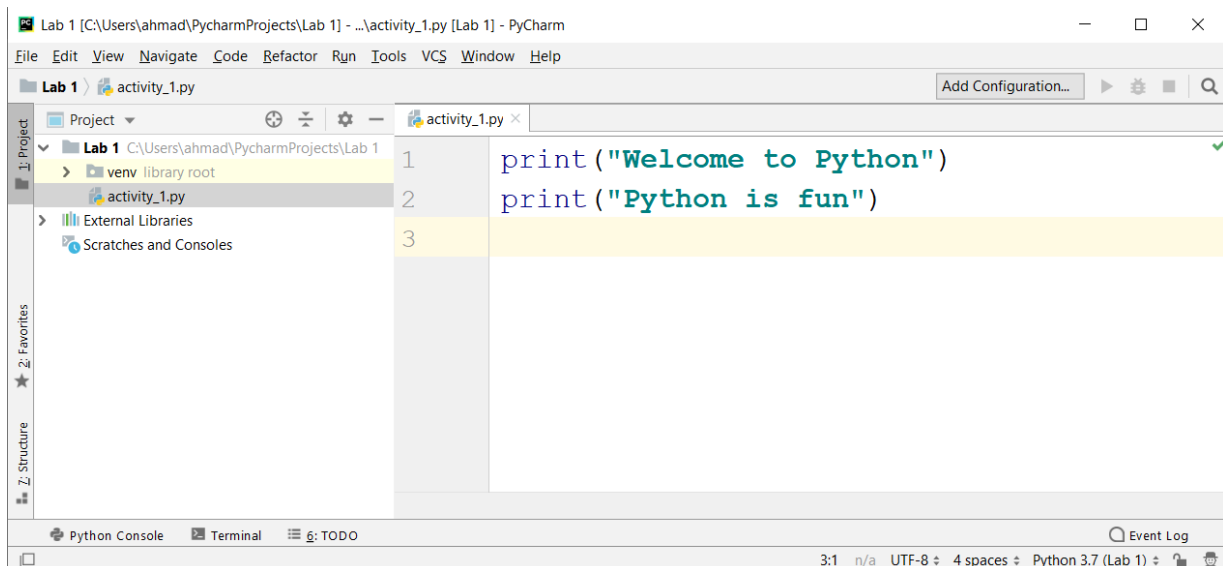
- Then, name the new file “activity_1”, and click on “OK”.



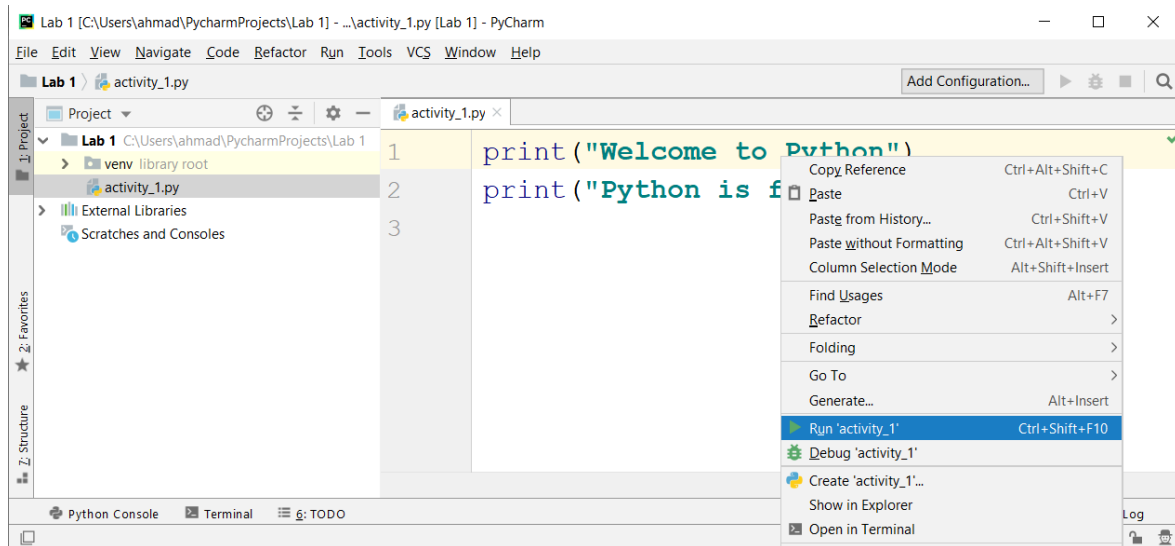
7. Now, the new file is created and opened. Write the code in it:

activity 1.py

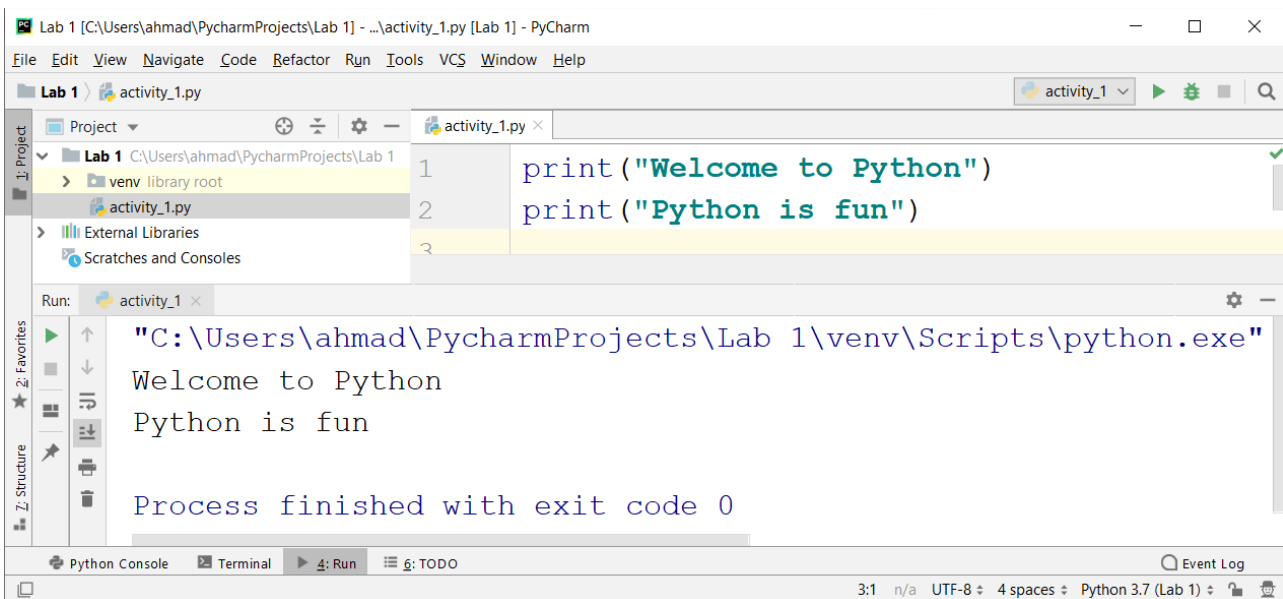
```
1 print("Welcome to Python")
2 print("Python is fun")
```



8. To run the file, right click on any area of the editor and click on (Run 'activity_1'), which is the name of the file.



9. After that, PyCharm is going to run the file using the Python interpreter, and then display the output of the file to you.



Problem 2

Programming Exercises (1.4)

Write a program that displays the following table:

a	a ²	a ³
1	1	1
2	4	8
3	9	27
4	16	64

Solution

Phase 1: Problem-Solving Phase:

- 1- Print the table header.

```
a. print("a          a^2          a^3")
```

- 2- Print the first row.

```
a. print("1          1          1")
```

- 3- Print the second row.

```
a. print("2          4          8")
```

- 4- Print the third row.

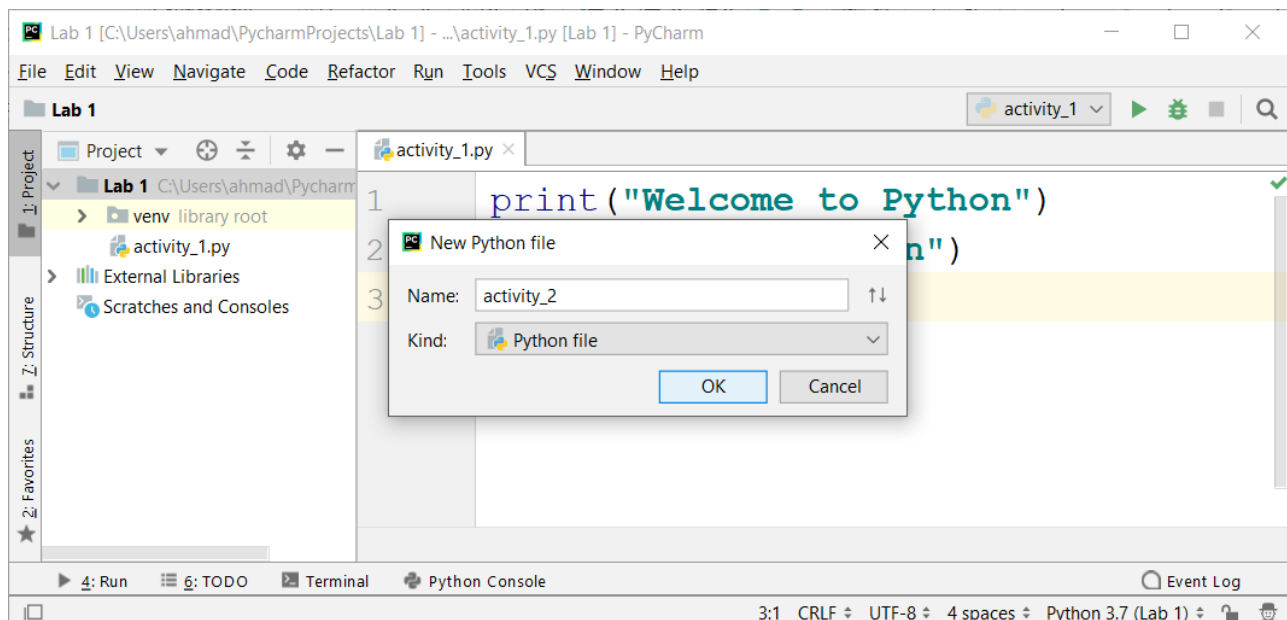
```
a. print("3          9          27")
```

- 5- Print the fourth row.

```
a. print("4          16         64")
```

Phase 2: Implementation Phase:

1. Open the project "Lab 1" if it was not opened.
2. Create a new file and name it "activity_2.py".



3. Write the following code in the file:

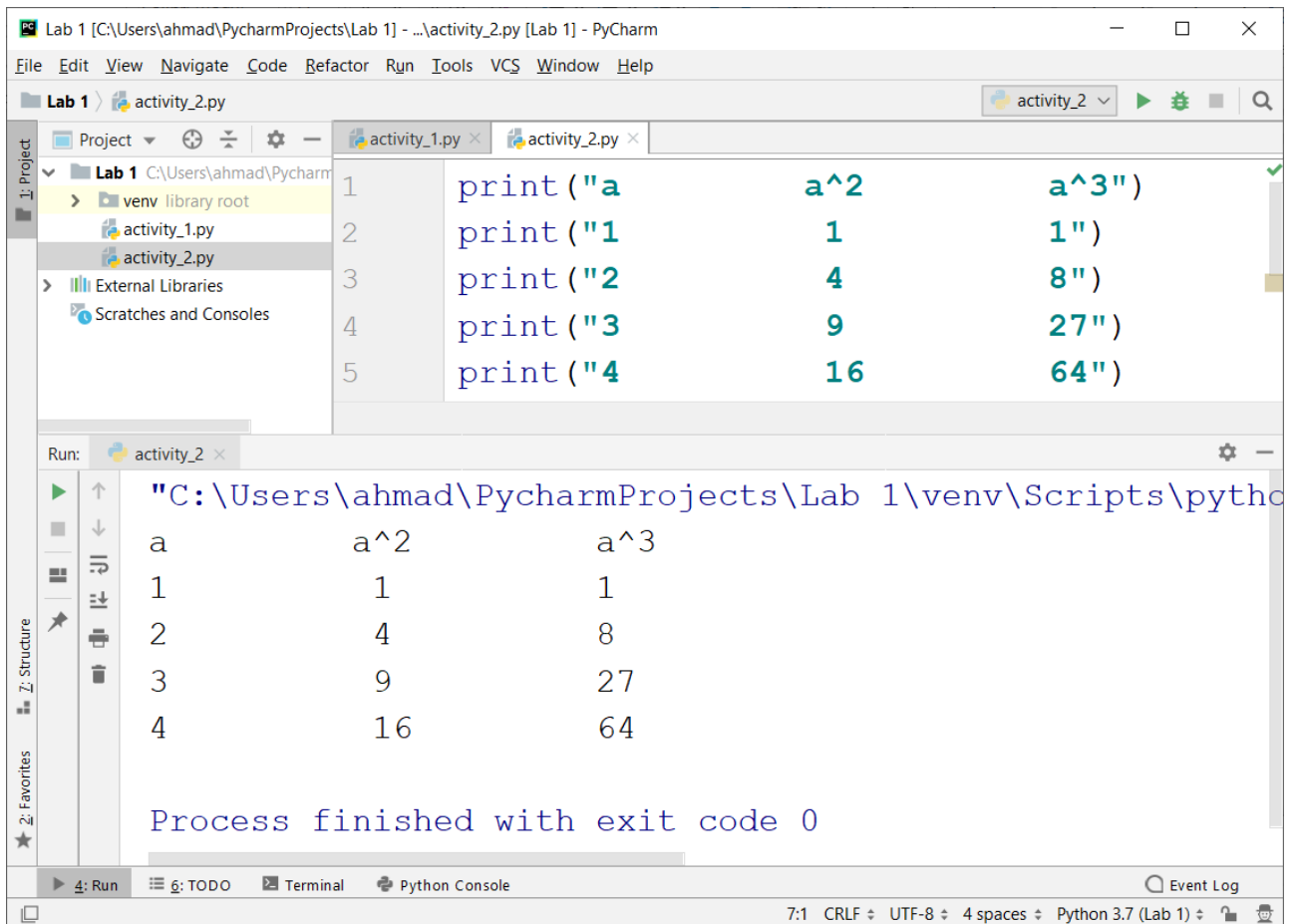
activity 2.py

```
1 print("a          a^2          a^3")
2 print("1          1          1")
3 print("2          4          8")
4 print("3          9          27")
```



```
5 print("4      16      64")
```

4. Run the code:



The screenshot shows the PyCharm IDE interface. The main editor window displays a Python script with five lines of code. The code prints a table with three columns: 'a', 'a^2', and 'a^3'. The values for 'a' are 1, 2, 3, and 4. The corresponding values for 'a^2' are 1, 4, 9, and 16. The corresponding values for 'a^3' are 1, 8, 27, and 64. The code is as follows:

```
1 print("a      a^2      a^3")
2 print("1      1      1")
3 print("2      4      8")
4 print("3      9      27")
5 print("4      16     64")
```

The Run window at the bottom shows the output of the code execution. It displays the same table as the code, with the values for 'a', 'a^2', and 'a^3' printed on separate lines. The output is as follows:

```
"C:\Users\ahmad\PycharmProjects\Lab 1\venv\Scripts\python.exe"
a      a^2      a^3
1      1      1
2      4      8
3      9      27
4      16     64
```

Below the output, it states "Process finished with exit code 0".



Individual Activities (50 minutes)

Problem 3

Programming Exercises (1.2)

Write a program that displays Welcome to Python five times.



```
Welcome to Python
Welcome to Python
Welcome to Python
Welcome to Python
Welcome to Python
```

Problem 4

Programming Exercises (1.3)

Write a program that displays the following pattern:



```
FFFFFFF  U      U  NN      NN
FF        U      U  NNN     NN
FFFFFFF  U      U  NN N    NN
FF        U      U  NN  N   NN
FF        UUU     NN      NNN
```

Extra Exercises (**Homework**)

From the Textbook

- Programming Exercises:
 - 1.9

From MyProgrammingLab (<https://pearson.turingscraft.com>)

- 1.3
 - 60180
 - 60184
 - 60053
 - 60177
- 1.4
 - 60140

Upload Your Solutions



Upload your solutions of the lab activities to Blackboard.