

Lab 1 - Getting Started with Python I

| Chapter | 1. Introduction to Computers, Programs, and Python | Lab |
|---------|--|-----|
| Time | 80 Minutes | 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).



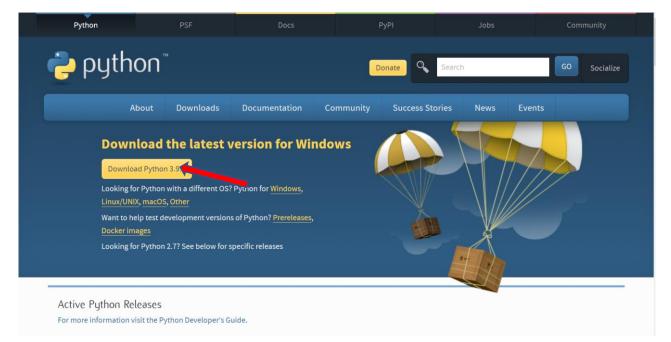
Installation Guide (5 minutes)

Installing Python

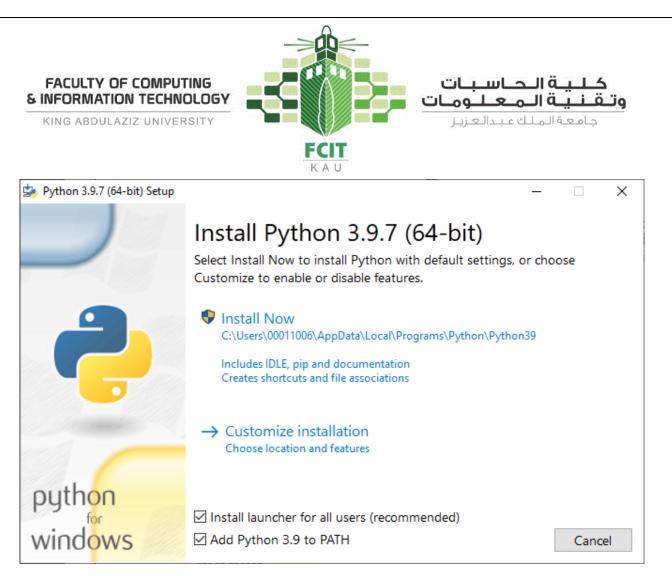
You need first to install Python interpreter (Python 3) on your computer to be able to run Python programs.

The following are instructions to download and install Python interpreter:

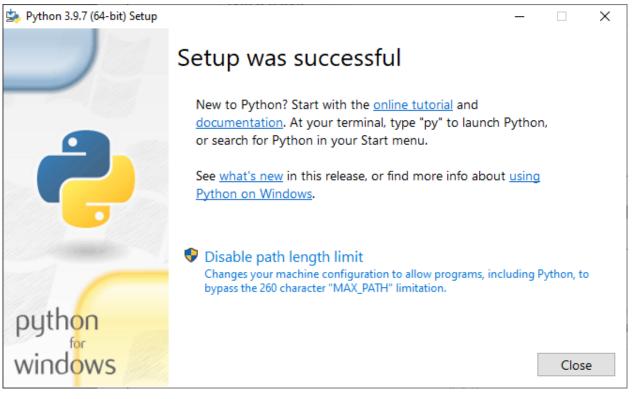
1. Go to <u>www.python.org/downloads</u> and download the last version of Python 3.x.x for your operating system.



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.



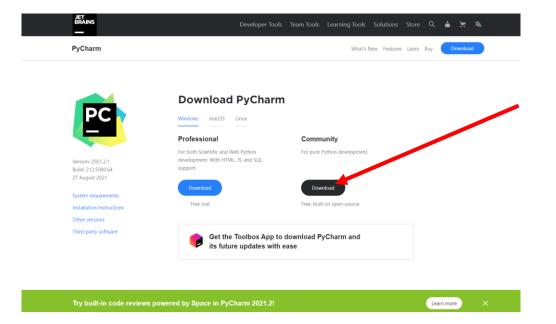


Installing PyCharm

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".

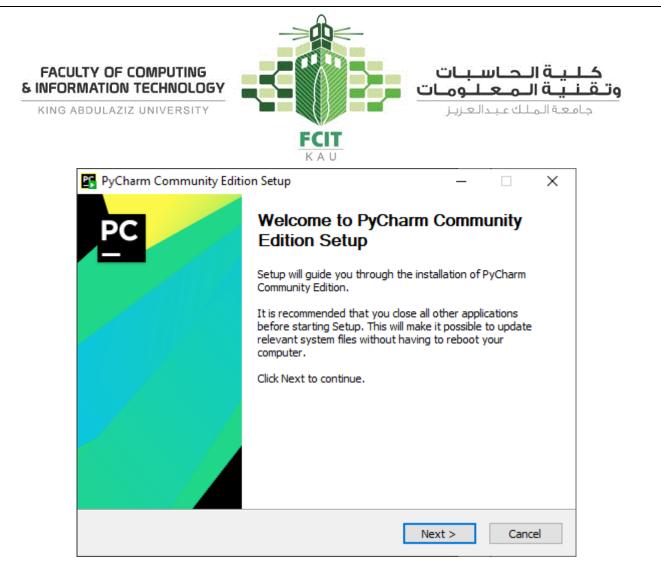
The following are instructions to download and install Python interpreter:

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

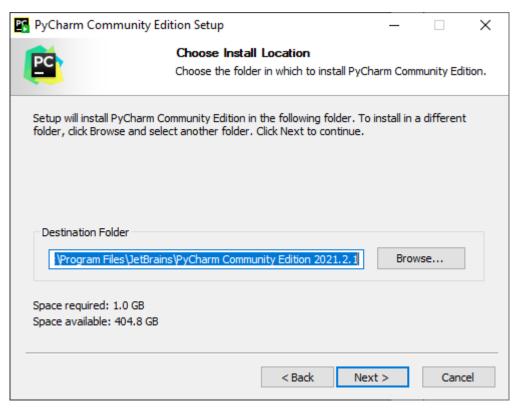


2. After the download is finished, double click on the file to run the installer. Then, click on *"Next >"*.

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3. Then, click on "Next >".





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

| PyCharm Commun | ity Edition Setup |) | _ | | × |
|---|--|--|----------------------|--------|-----|
| P | | i on Options your PyCharm Commun | ity Edition installa | ation | |
| Create Desktop Sh PyCharm Commu Update Context Me Add "Open Folde Create Association .py | unity Edition enu er as Project" | | ariable (restart no | eeded) | |
| | | < Back | Next > | Cano | cel |

5. Then, click on "Install".

| FACULTY OF COMPUTING & INFORMATION TECHNOLOGY KING ABDULAZIZ UNIVERSITY | | حــاسـبـات ــ <mark>مـعـلـومـات</mark> لـك عبدالعزيز | وتقنيةاا |
|---|--|---|-----------------------|
| PyCharm Community Ed | ition Setup | - 🗆 | × |
| | Choose Start Menu Folder Choose a Start Menu folder for the shortcuts. | e PyCharm Community Edi | tion |
| Select the Start Menu folder can also enter a name to cre JetBrains | in which you would like to create th eate a new folder. | e program's shortcuts. Yo | u |
| Accessibility Accessories Acronis Administrative Tools Cisco Dropbox Lenovo ThinkVantage Tools Maintenance Microsoft Endpoint Manage Microsoft Office 2016 Tools NVIDIA Corporation Python 3.9 | r | | ▲ |
| | < Back | Install Cano | el |

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

| PyCharm Community Ec | dition Setup | | _ | | \times |
|-------------------------|--|----------------|--------------------|---------------|----------|
| PC | Installing Please wait while | PyCharm Commur | nity Edition is be | ing installed | |
| Extract: tableparser.py | 100% | | | | |
| Show details | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | < Back | Next > | Cancel | |



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

| PyCharm Community Editio | on Setup | | _ | | \times |
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| PC | Completing PyC Edition Setup | harm Co | mmu | nity | |
| | PyCharm Community Edition computer. | on has been ins | stalled o | n your | |
| | Click Finish to close Setup. | | | | |
| | Run PyCharm Commun | ity Edition | | | |
| | | | | | |
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| | < Back | Finish | | Cano | el |

8. Then, check the checkbox and click on "Continue".

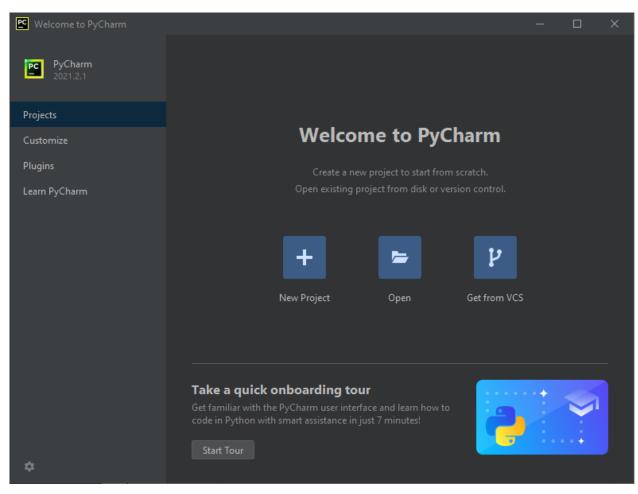
| PC | PyCharm User Agreement | × |
|----|---|---|
| | | |
| | | |
| | JETBRAINS COMMUNITY EDITION TERMS | |
| | | |
| | IMPORTANT! READ CAREFULLY: | |
| | THESE TERMS APPLY TO THE JETBRAINS INTEGRATED DEVELOPMENT ENVIRONMENT | |
| | TOOLS CALLED 'INTELLU IDEA COMMUNITY EDITION' AND 'PYCHARM COMMUNITY | |
| | EDITION' (SUCH TOOLS, "COMMUNITY EDITION" PRODUCTS) WHICH CONSIST OF 1) | |
| | OPEN SOURCE SOFTWARE SUBJECT TO THE APACHE 2.0 LICENSE (AVAILABLE HERE: https:// | |
| | //www.apache.org/licenses/LICENSE-2.0), AND 2) JETBRAINS PROPRIETARY SOFTWARE PLUGINS PROVIDED IN FREE-OF-CHARGE VERSIONS WHICH ARE SUBJECT TO TERMS | |
| | DETAILED HERE: https://www.jetbrains.com/legal/community-bundled-plugins. | |
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| | 275. | |
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| | accordance with these terms, where "Organization" includes any corporation, company | |
| | I confirm that I have read and accept the terms of this User Agreement | |
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| | Exit Continu | e |
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9. Then, click on "Don't send".

| РС | Data Sharing | \times |
|----|---|----------|
| | DATA SHARING | |
| | Help JetBrains improve its products by sending anonymous data about features and plugins used, hardware and software configuration, statistics on types of files, number of files per project, etc. | |
| | Please note that this will not include personal data or any sensitive information, such as source code, file names, etc. The data sent complies with the JetBrains Privacy Policy. | |
| | Data sharing preferences apply to all installed JetBrains products. | |
| | You can always change this behavior in Settings Appearance & Behavior System Settings Data Sharing. | |
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| | Don't Send Send Anonymous Statisti | cs |

10. 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

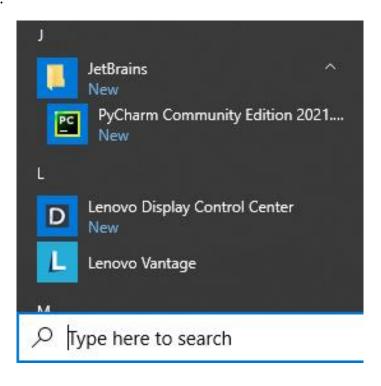
Solution

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).
 - o print("Welcome to Python")
- 2- Print the second message "Python is fun".
 - o print("Python is fun")

Phase 2: Implementation Phase:

1. Open PyCharm.





2. Then, click on "New Project".

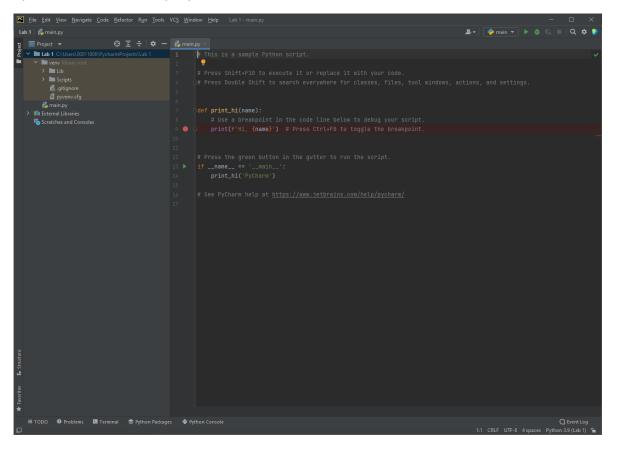
| 🗠 Welcome to PyCharm | | — | × |
|------------------------|--|-----|---|
| PC PyCharm 2021.2.1 | | | |
| Projects | | | |
| Customize | Welcome to PyCharm | | |
| Plugins | | | |
| Learn PyCharm | | | |
| | + = ŀ | | |
| | New Project Open Get from VCS | | |
| | | | |
| | Take a quick onboarding tour | • • | |
| | Get familiar with the PyCharm user interface and learn how to code in Python with smart assistance in just 7 minutes! | | |
| ¢ | | | |

3. Then, name it "Lab 1".

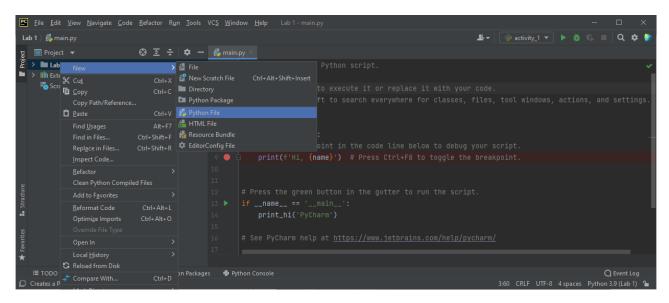
| Kew Project | - | | × |
|--|-------|-----|------|
| Location: C:\Users\00011006\PycharmProjects\Lab 1 | | | |
| ▼ Python Interpreter: New Virtualenv environment | | | |
| New environment using Rev Virtualenv | | | |
| Location: C:\Users\00011006\PycharmProjects\Lab 1\venv | | | |
| Base interpreter: 🛛 🏺 C:\Users\00011006\AppData\Local\Programs\Python\Python39\python.exe | | | |
| Inherit global site-packages | | | |
| Make available to all projects | | | |
| Previously configured interpreter | | | |
| Interpreter: <pre></pre> | | | |
| Create a main.py welcome script Create a Python script that provides an entry point to coding in PyCharm. | | | |
| | reate | Car | icel |



4. 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.



5. Select the project name on the left menu, right click on it and select "New" \rightarrow "Python File".





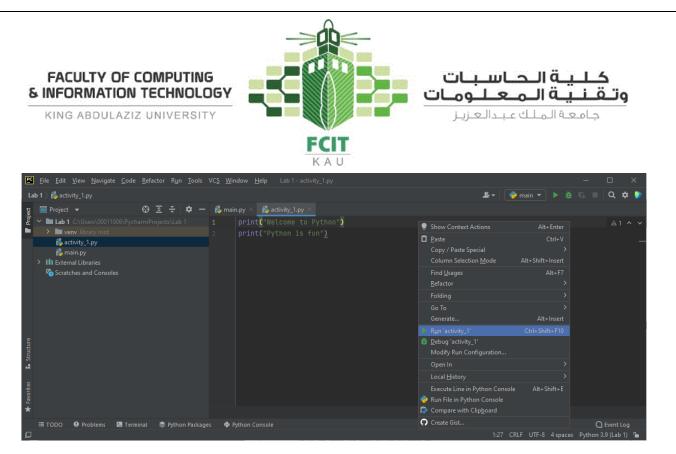
6. Then, name the new file "activity_1".

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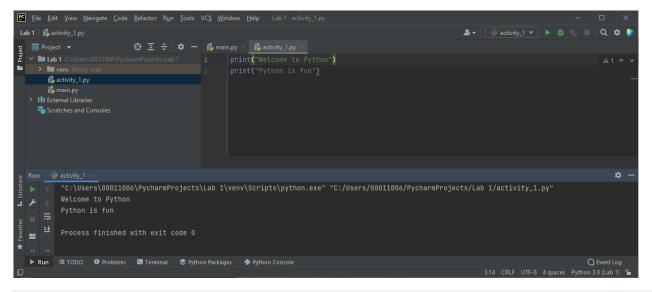
7. Now, the new file is created and opened. Write the code in it:

| activity 1.py | | | | | | | | | |
|--|---------------------------------------|--|--|--|--|--|--|--|--|
| <pre>1 print("Welcome to Python") 2 print("Python is fun")</pre> | | | | | | | | | |
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| | 2 print("Python is fun") | | | | | | | | |
| | | | | | | | | | |
| I TODO | es 🛛 🗣 Python Console | O Event Log 2:23 CRLF UTF-8 4 spaces Python 3.9 (Lab 1) 🄒 | | | | | | | |

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 |
| | | |



a^3") 1")

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 | | |
| 2 | print("1 | 1 | | |

| 3 | print("2 | 4 | 8") |
|---|----------|----|------|
| 4 | print("3 | 9 | 27") |
| 5 | print("4 | 16 | 64") |

4. Run the code:



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

Problem 4

Programming Exercises (1.3)

Write a program that displays the following pattern:

| | FFFFFFF | U | U | NN | | NN |
|--|---------|----|-----|------|-----|-----|
| | FF | U | U | NNN | NNN | |
| | FFFFFFF | U | U | NN I | N | NN |
| | FF | U | U | NN | Ν | NN |
| | FF | JU | UUU | | | NNN |



Extra Exercises (Homework)

From the Textbook

- Programming Exercises:
 - o **1.9**

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

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

Upload Your Solutions

Upload your solutions of the lab activities to Blackboard.