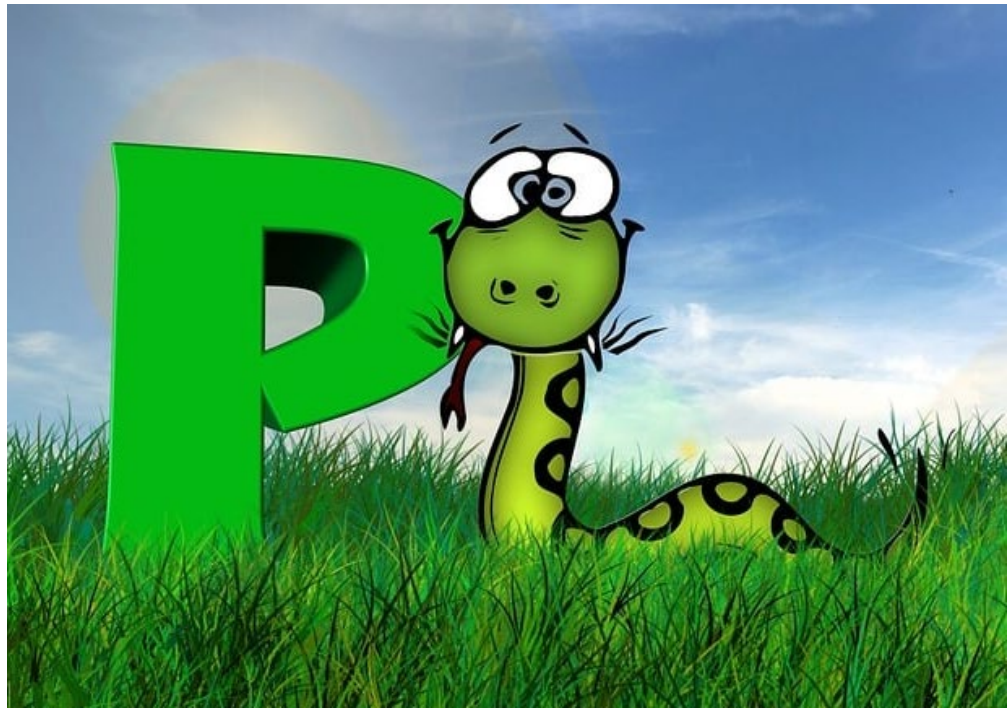
Python - Introduction

By: Winston Yeung

Department of Engineering

IVE(Lee Wai Lee)



Revised: April 2025

Learning Outcomes

After completion of the 2-hour taster programme, students should be able to:

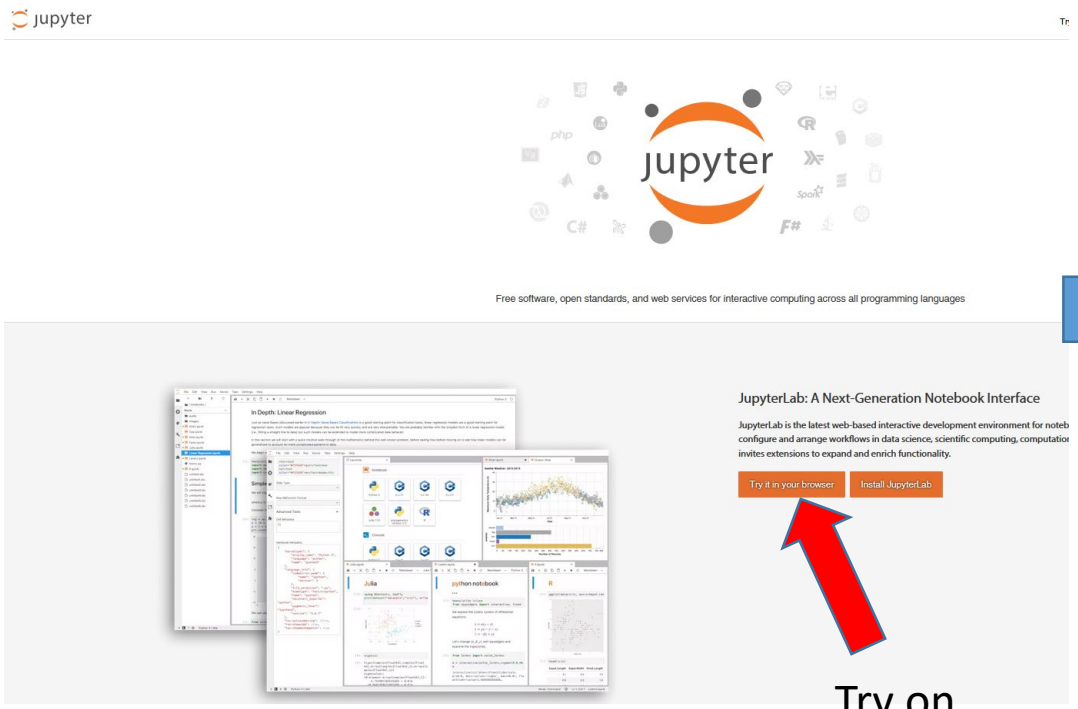
- Install Python and IDE on PC and use them to write codes
- Understand the Python basics (e.g. syntax, comments, variables, data types, numbers, Booleans, strings, lists)
- Understand simple conditionals (e.g. if statement, for and while loops)
- write a Python code to solve simple math problem

Why Python?

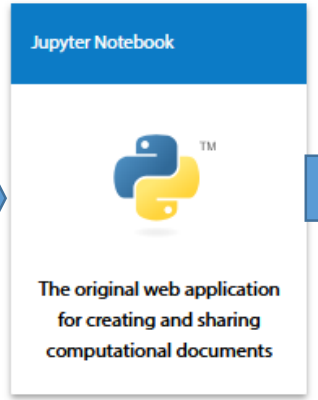
- Easy to use
- Active community
- Compatible with many platforms
- Excellent ranges of libraries, packages
- Data science
- Machine learning
- Web development
- Career opportunities

Just want to try Python without installing anything?

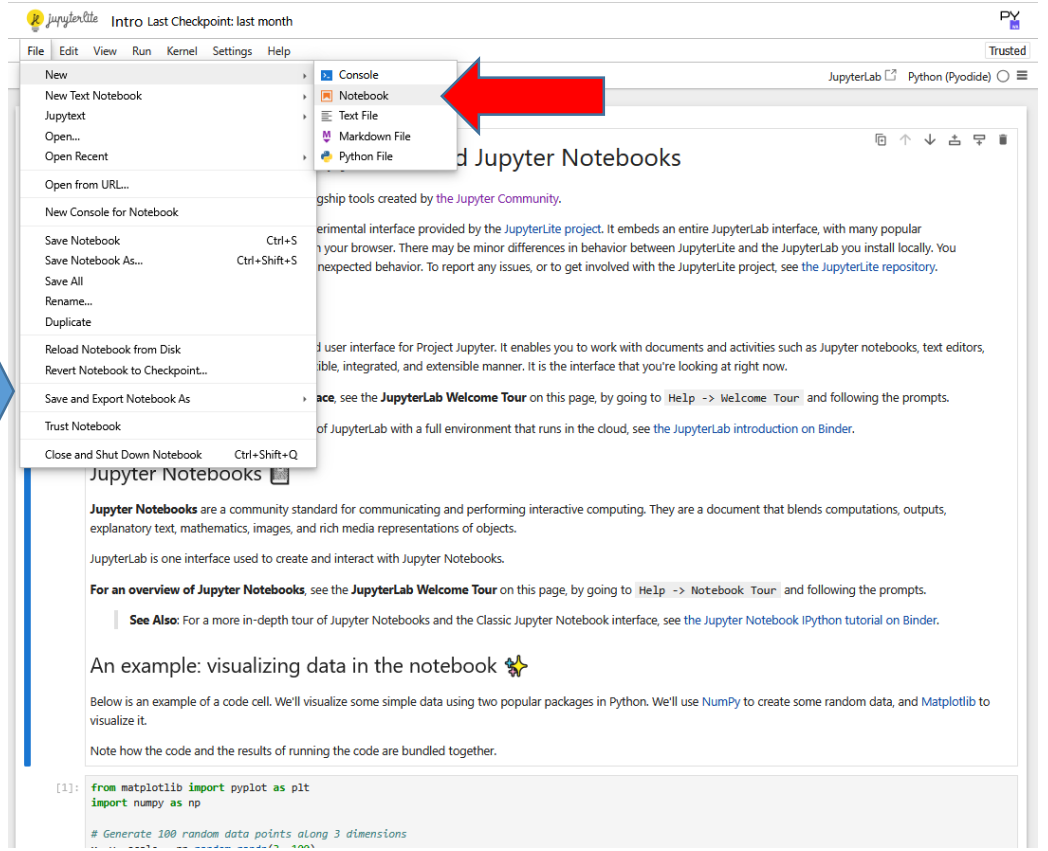
- Go to https://jupyter.org/



Try on browser

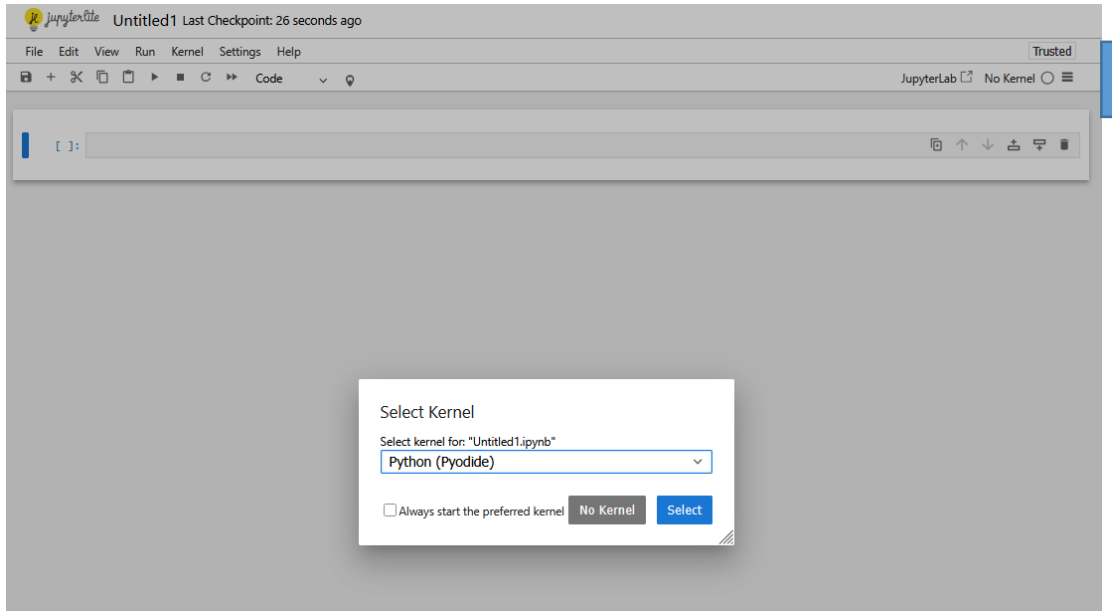


File → New → Notebook

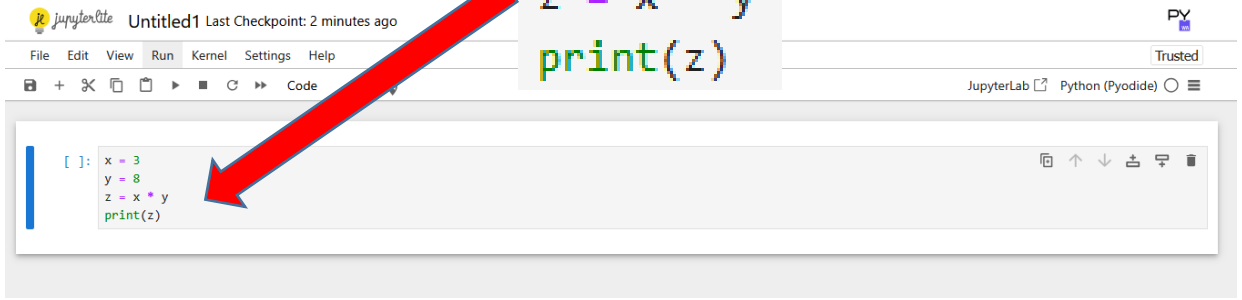


Using Jupyter Notebook online (no download)

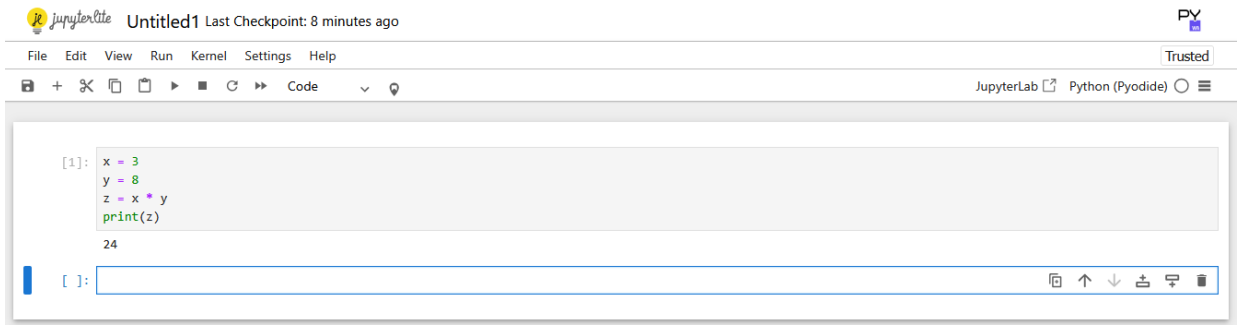
- Select the right kernel




```
x = 3
y = 8
z = x * y
print(z)
```



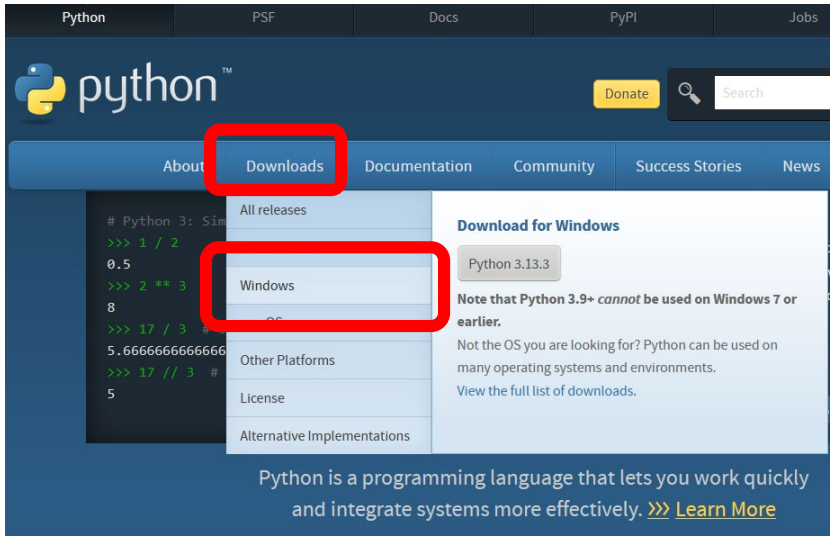
Run the selected cell by pressing
"Shift" + "Enter" or ▶



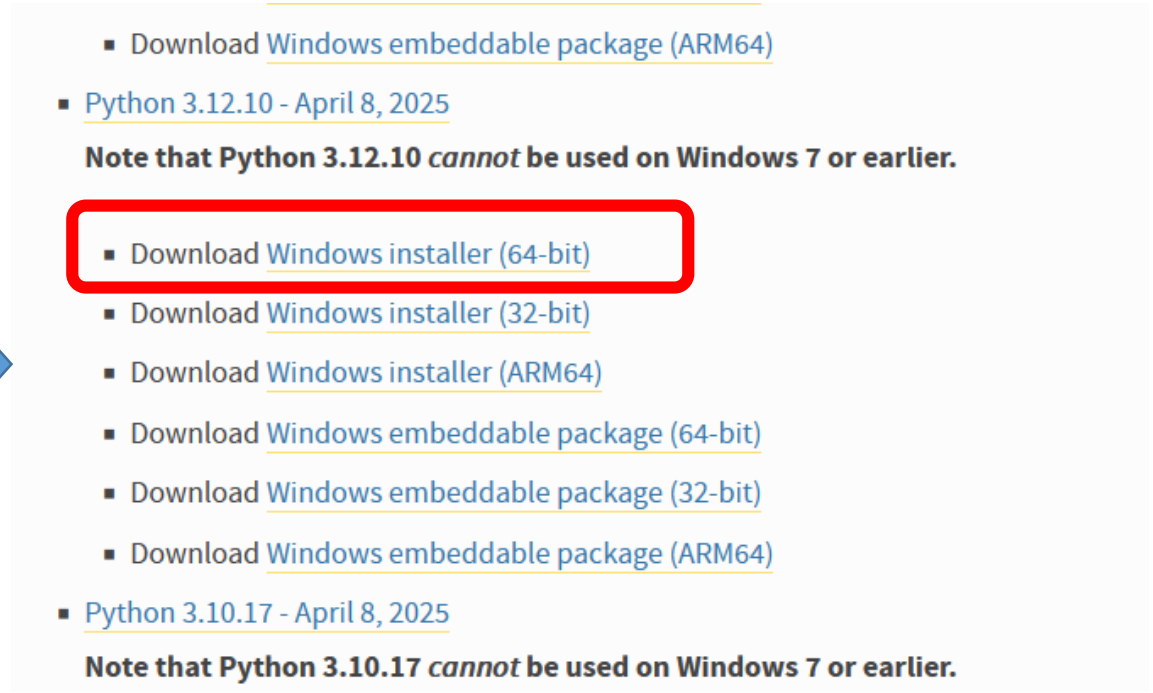
Python on your PC

- https://www.python.org/

1. Downloads → Windows



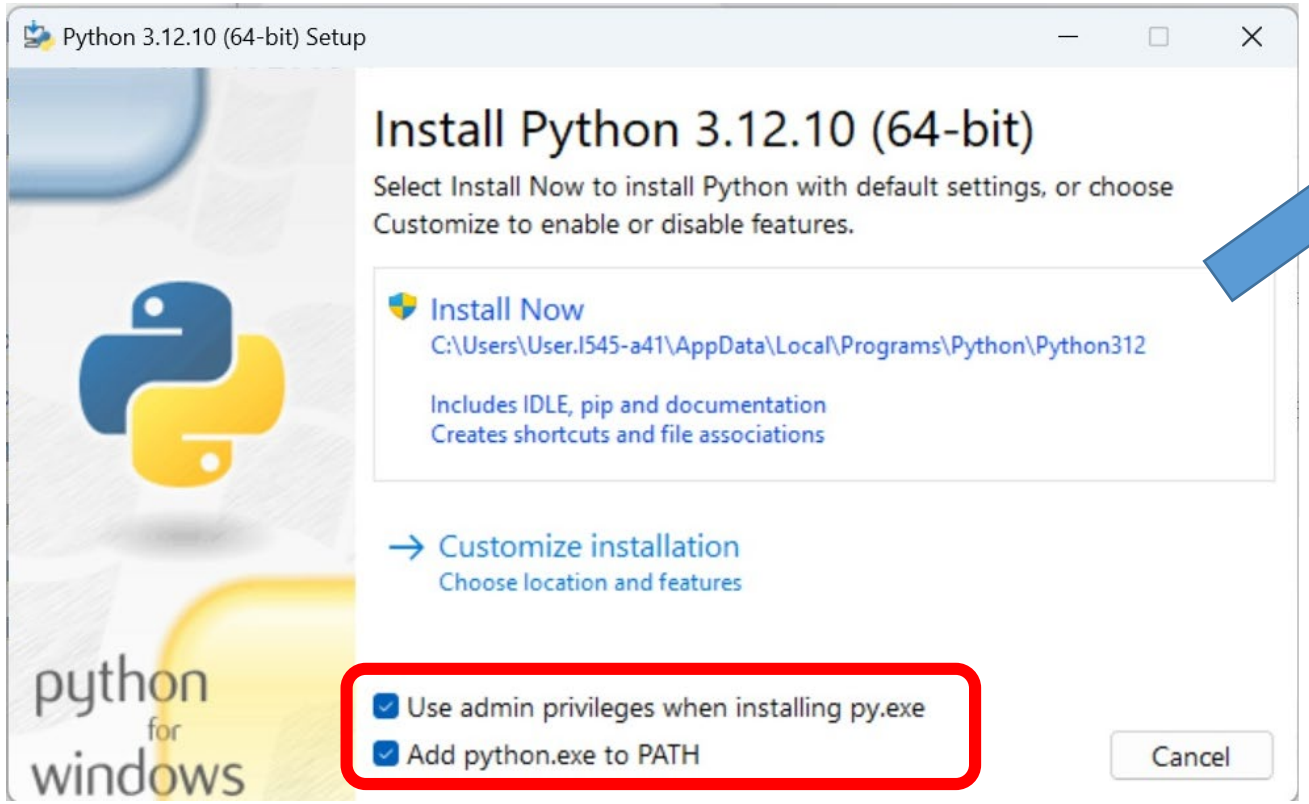
2. Scroll down and find Python 3.12.10, download the installer for Windows (64-bit)

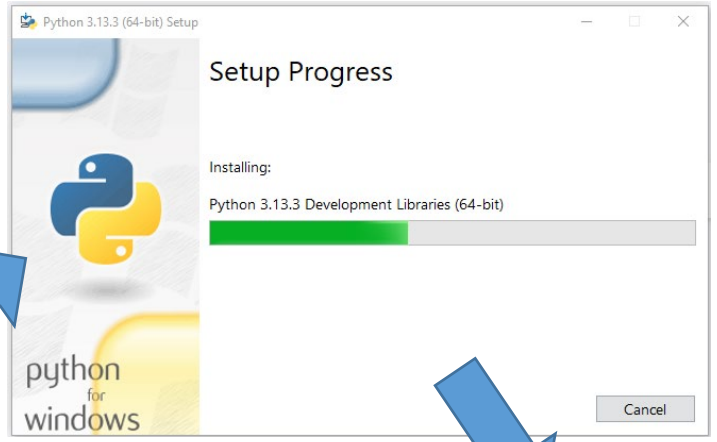


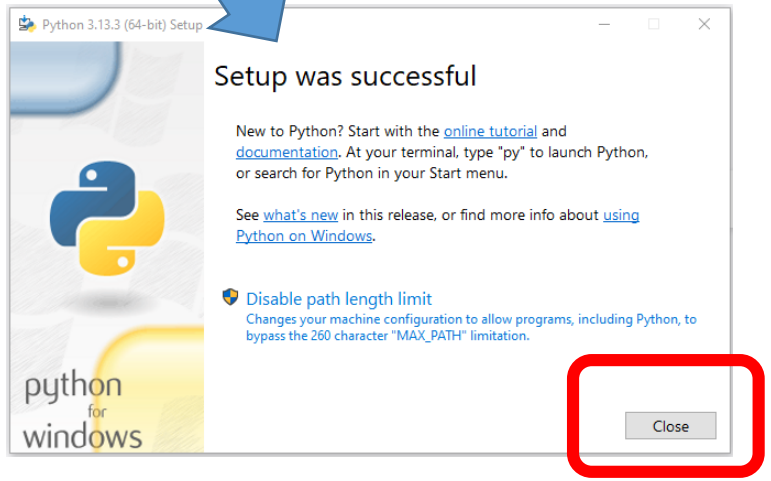
3. From your Download folder, double click the application file (python-3.12.10-amd64.exe) that you just downloaded

Install Python 3.12.10 (64-bit)

- Make sure “Add python.exe to PATH” is checked ☑
- Then, click “Install Now”



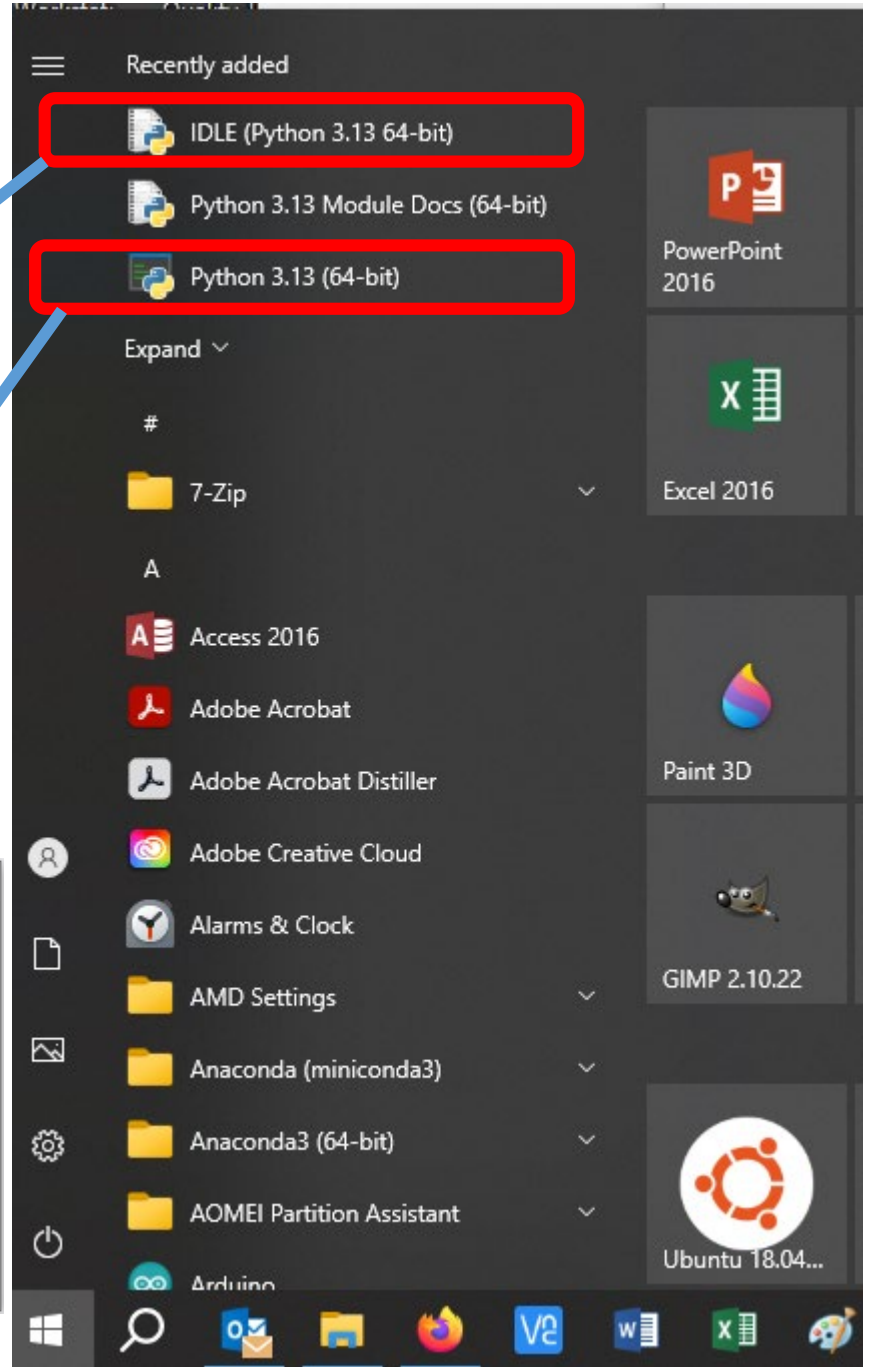


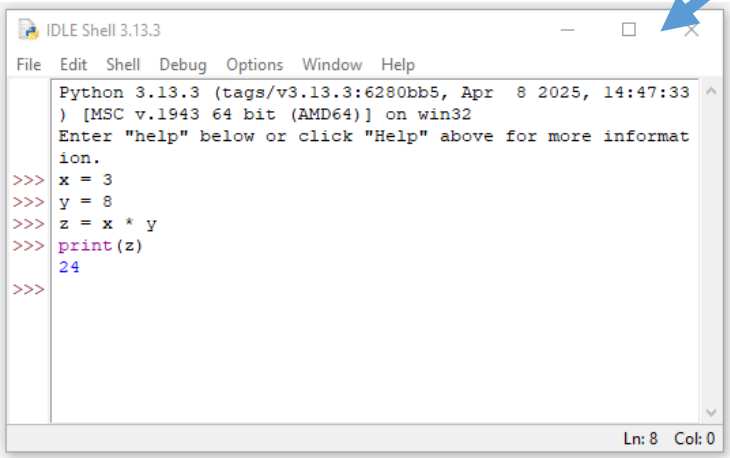


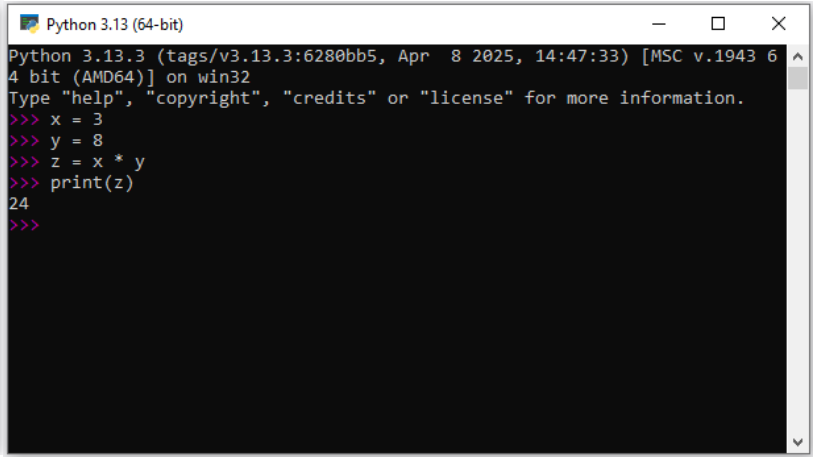
Python installed

For Windows 10

- Try the **IDLE** and Python Shell that are installed together
- **IDLE** is Python's **I**ntegrated **D**evelopment and **L**earning **E**nvironment
- Python Shell window



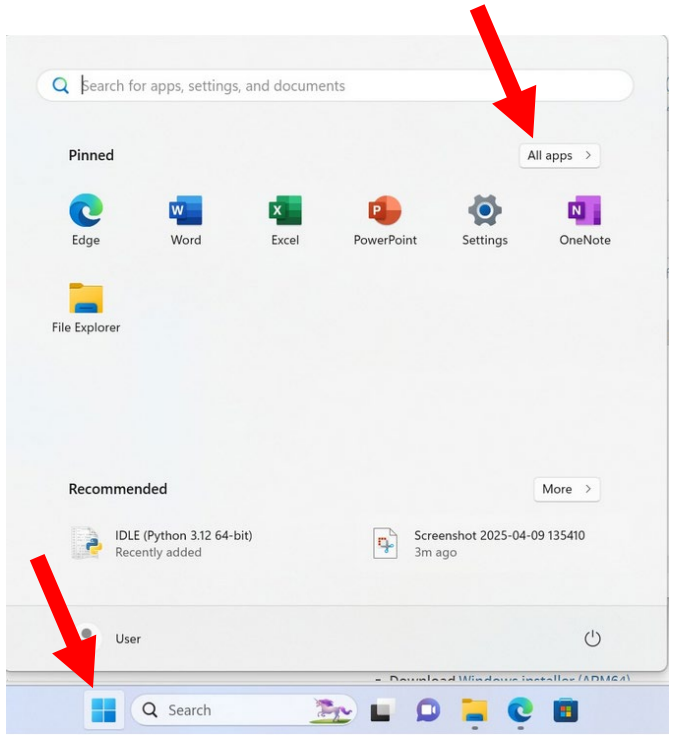


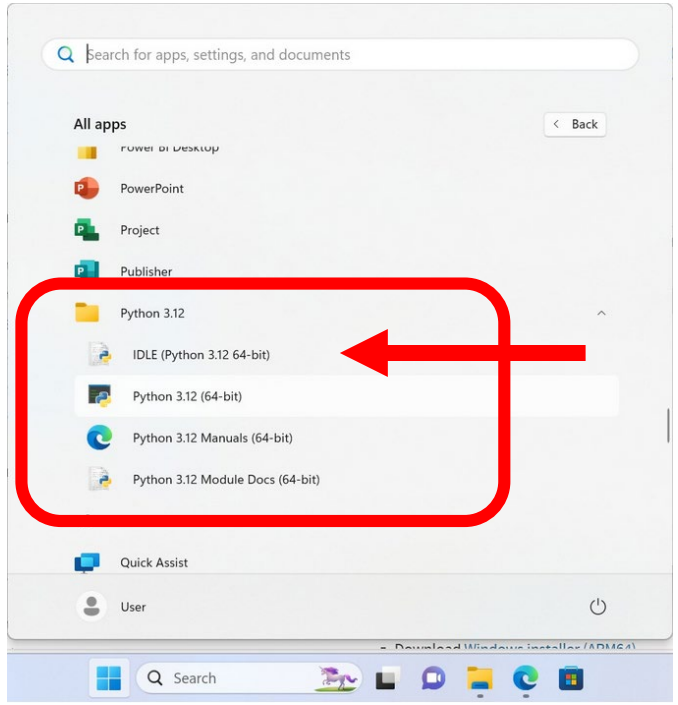


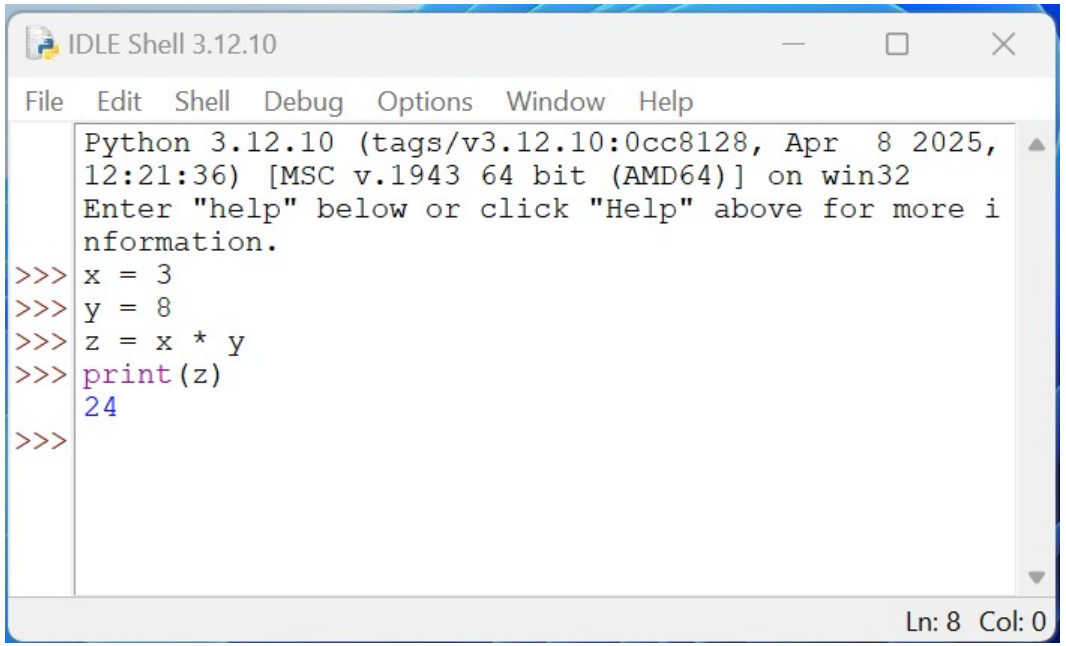
Run Python

For Windows 11

- Run the Python IDLE Shell after Python is installed







Some good IDE (Integrated Development Environment)

- There are several popular Python IDEs that your can use for free

PyCharm

https://www.jetbrains.com/pycharm/

VS Code

https://code.visualstudio.com/

Sublime Text

https://www.sublimetext.com/

Atom

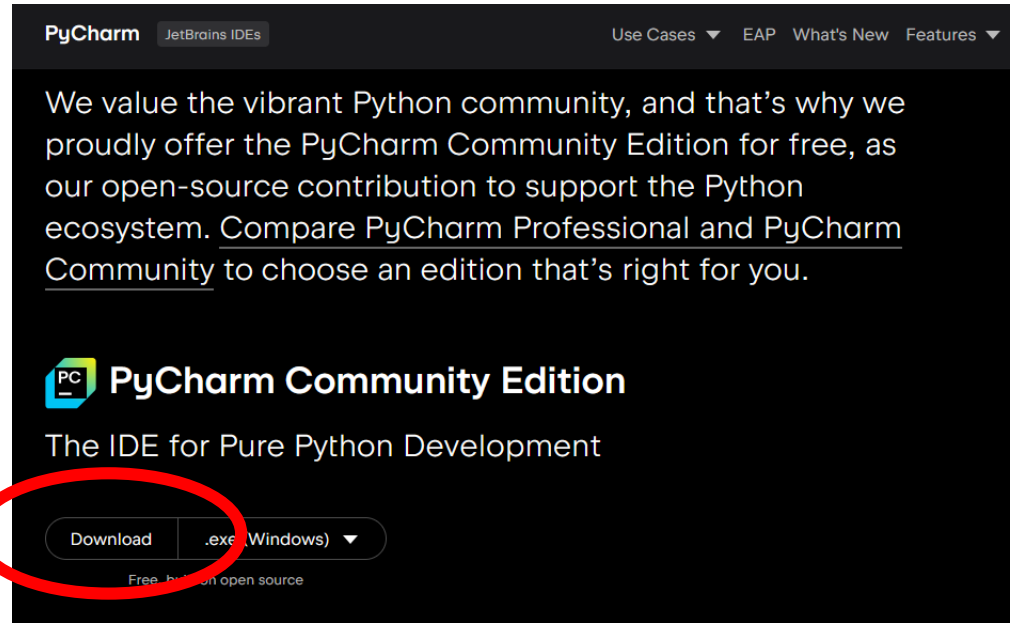
https://atom-editor.cc/

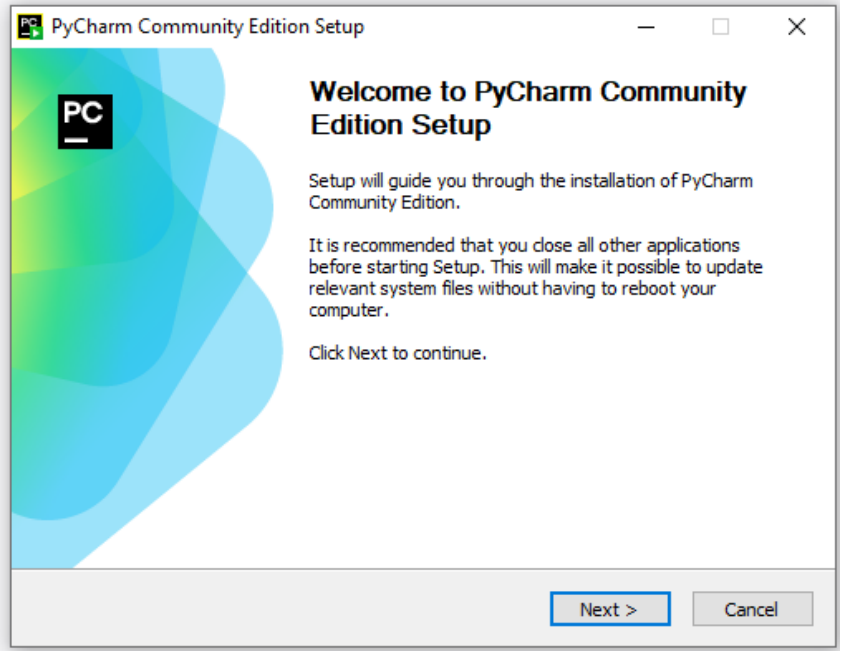
Thonny

PyCharm

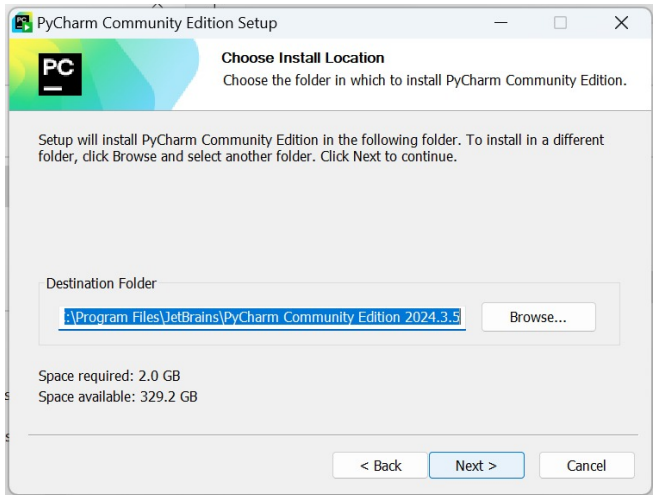
- Download PyCharm Community Edition

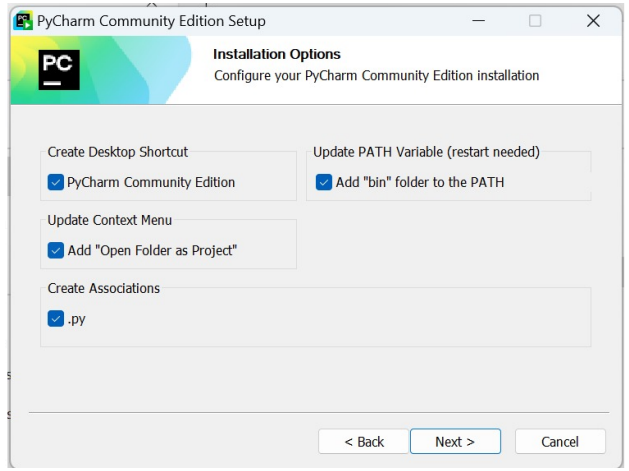
1. Scroll down and find the PyCharm Community Edition. It is a free open source software. Click "Download"
2. Go to Downloads folder and double click the pycharm-community-2024.3.5.exe file to start installation

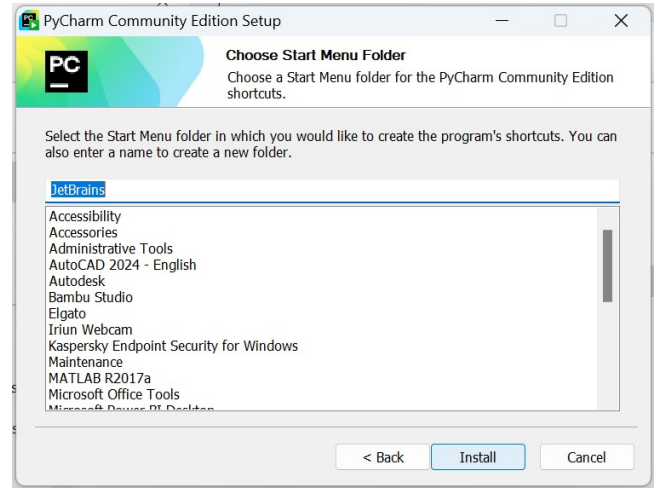


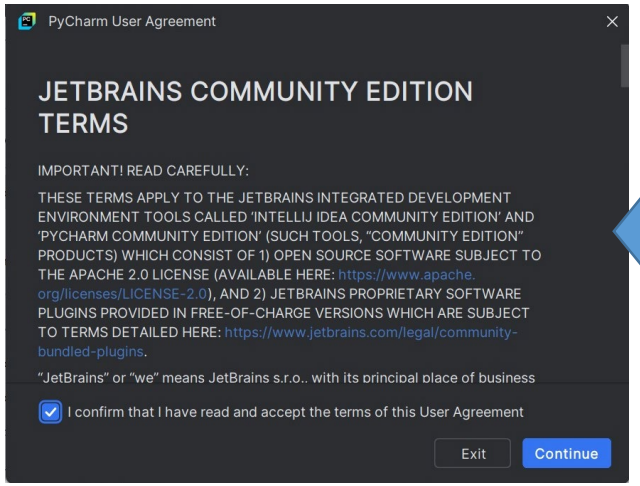


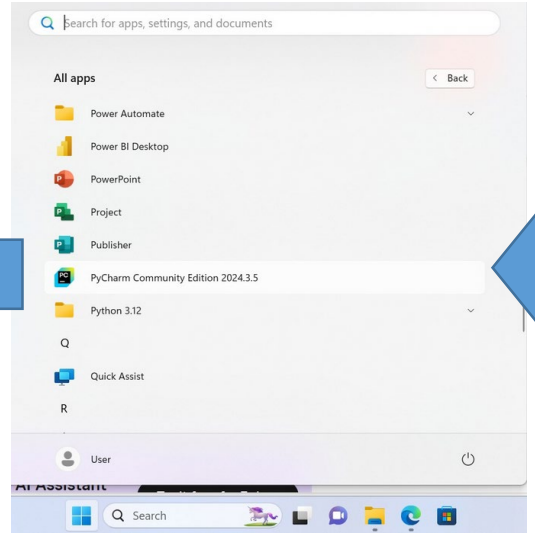
Install and run PyCharm (1)



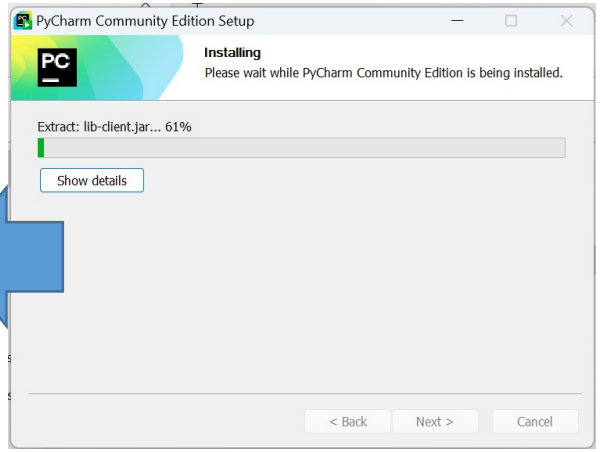




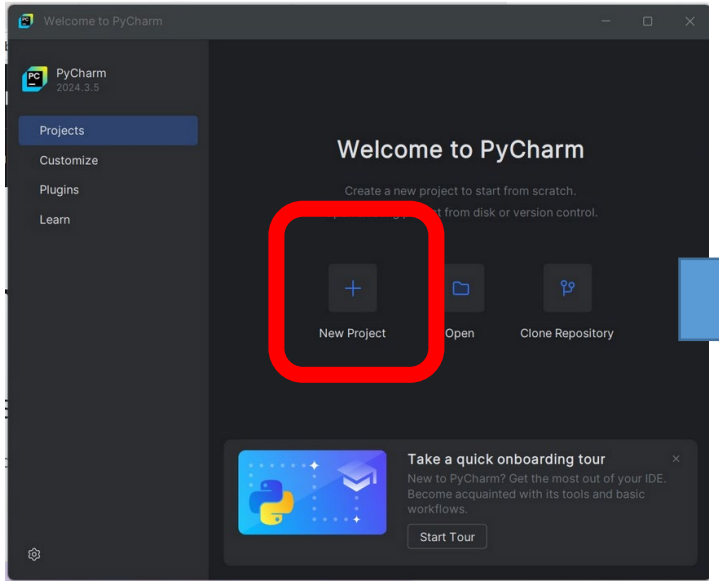


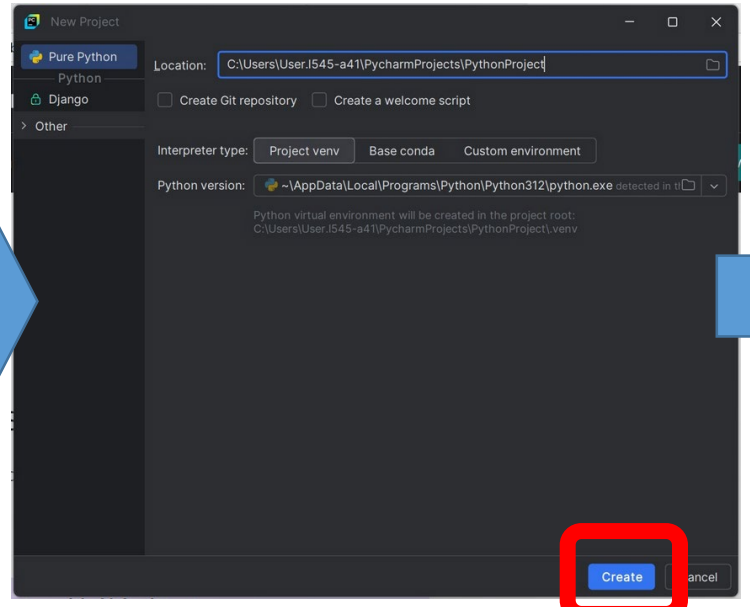


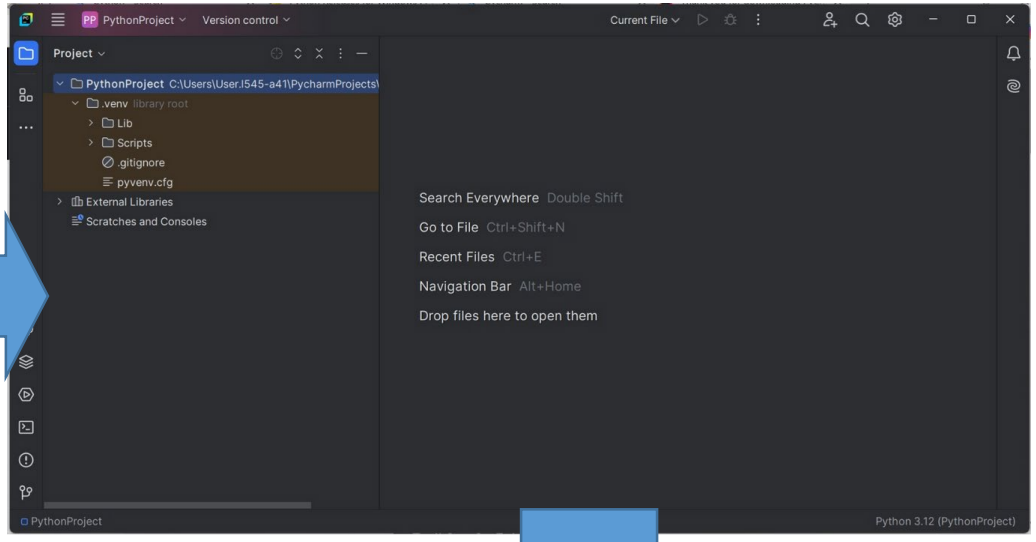
DO NOT RESTART YOUR COMPUTER

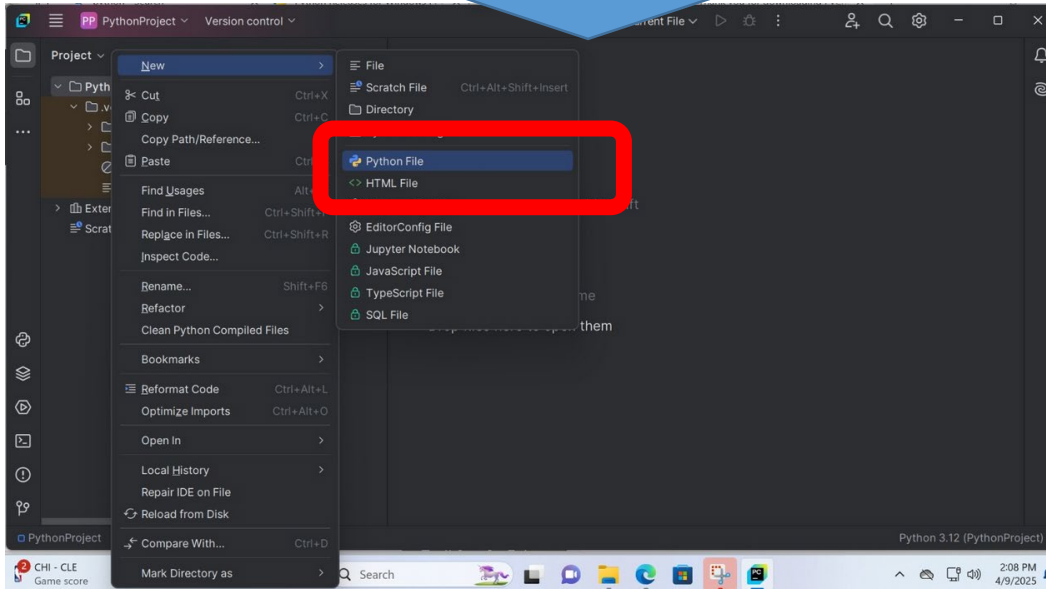


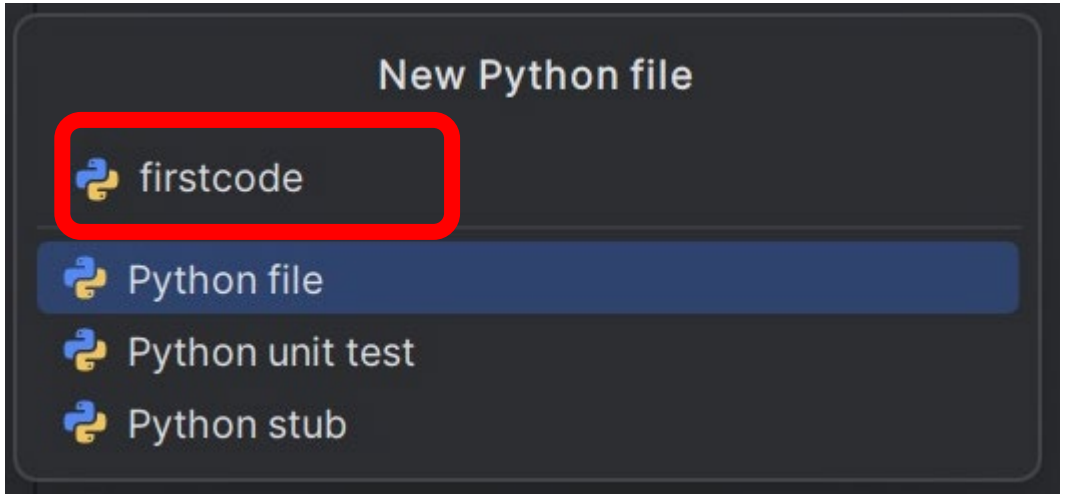
Install and run PyCharm (2)



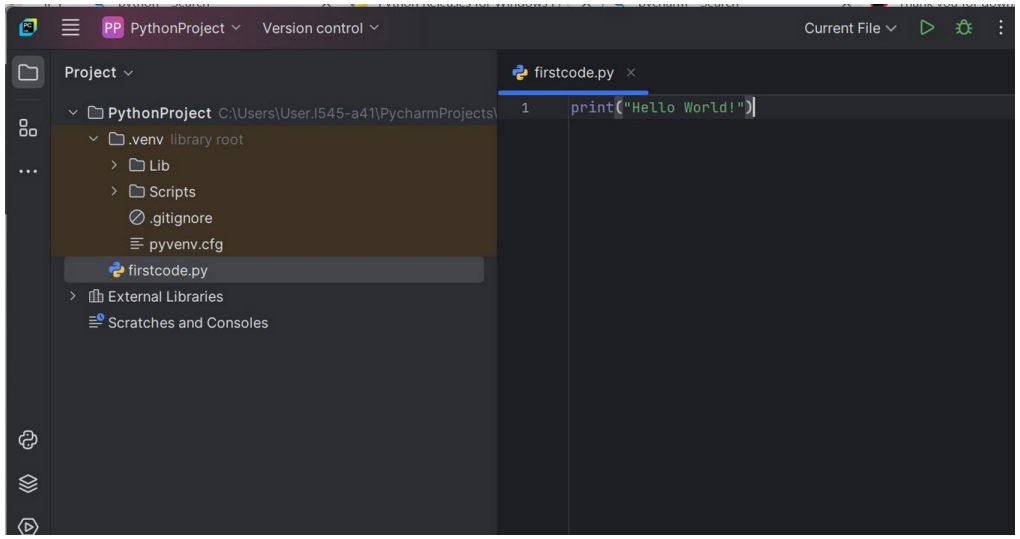


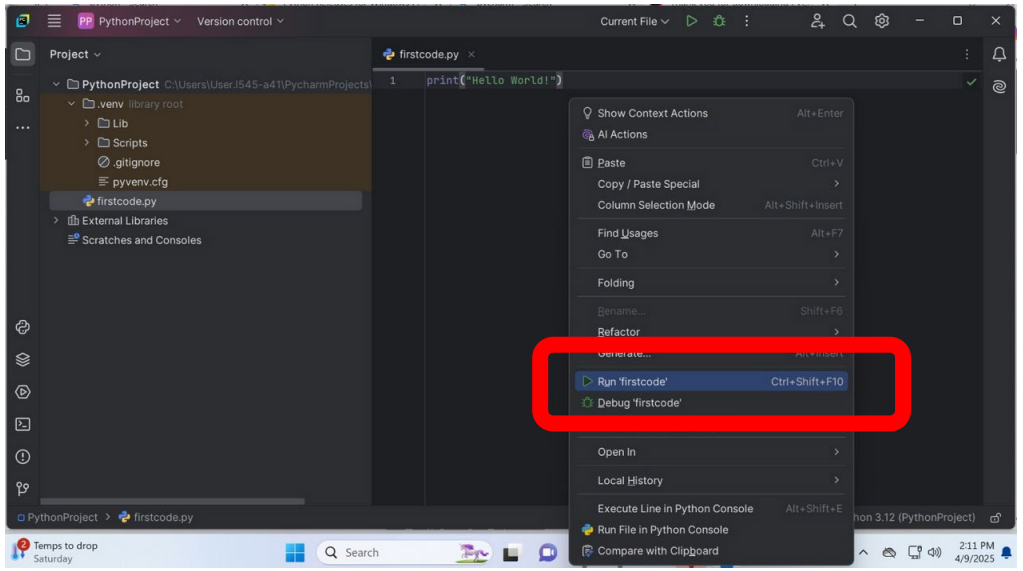


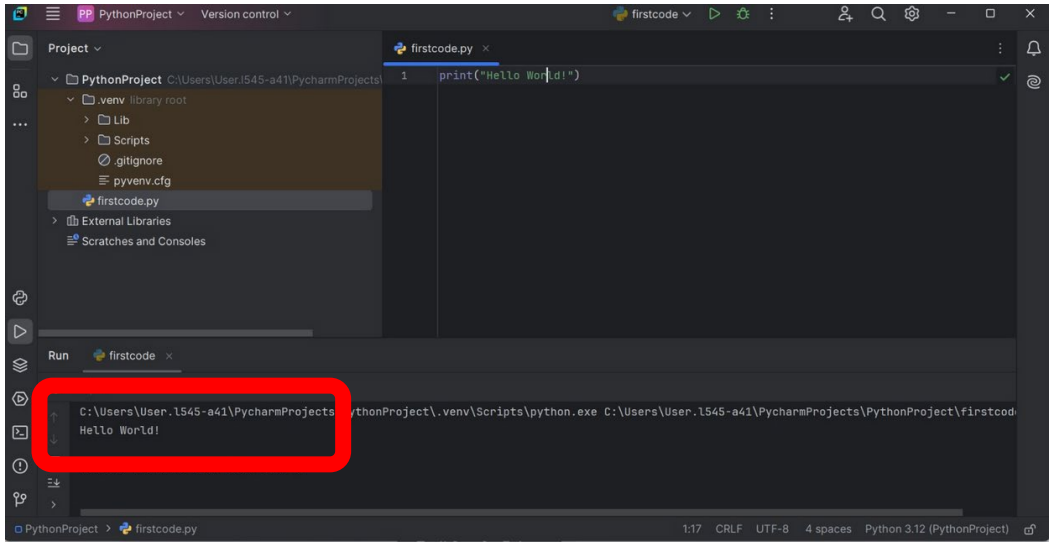




Install and run PyCharm (3)

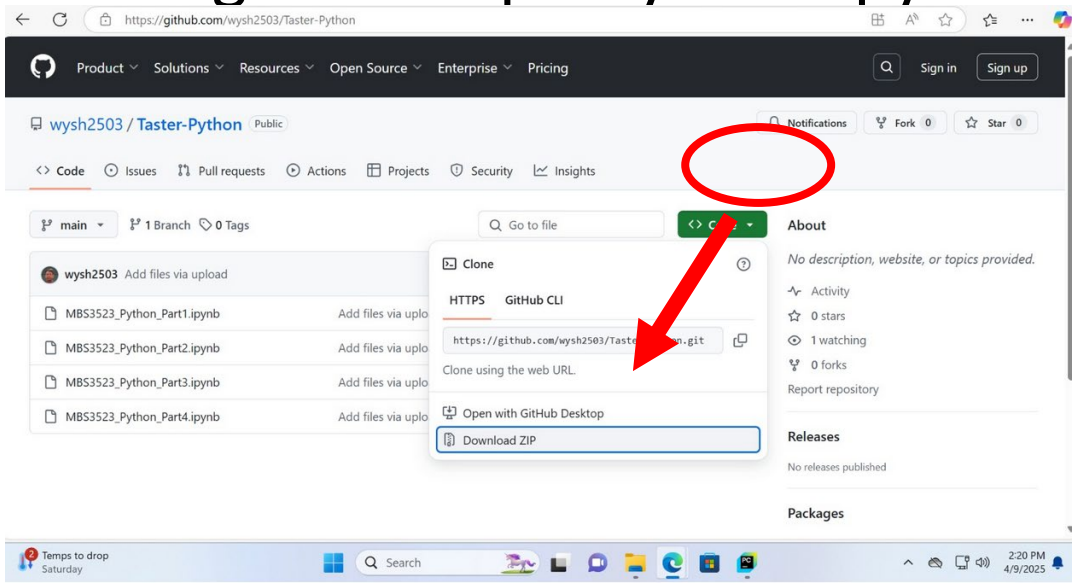


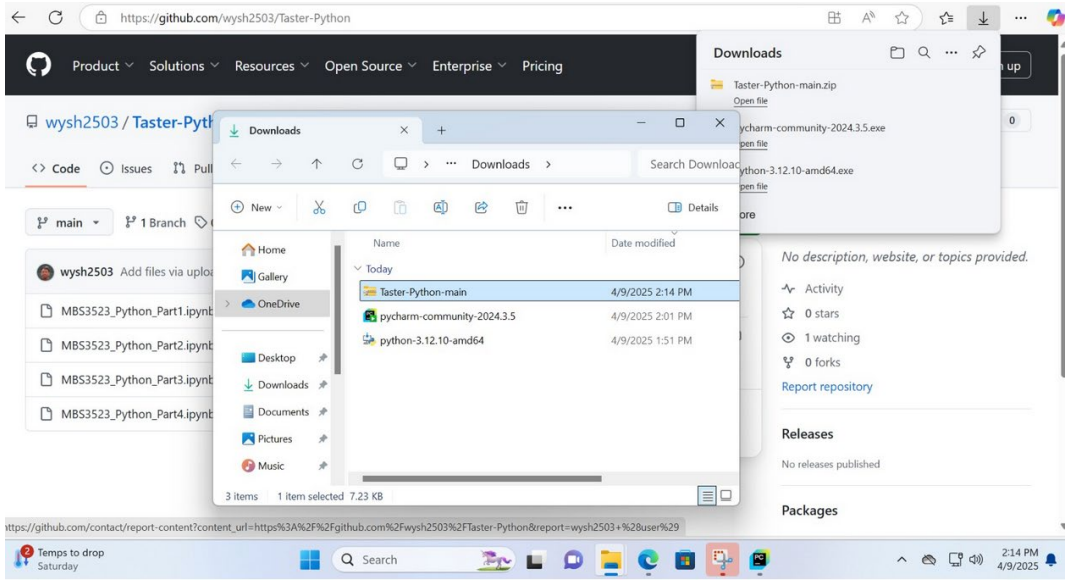




Time for practice

- Get the file from https://github.com/wysh2503/Taster-Python
- Download the 4 files (Code → Download ZIP), open the Download folder, right click the Taster-Python-main ZIP file and select “Extract All…” to unzip the folder, save them on your Desktop
- Drag and drop to your Jupyter Notebook





End of Taster test

Quadratic Equation

- Given: $y = 1.15x^2 + 0.1x - 6.2$
- Write a Python code to find the roots (when y = 0) of the above quadratic equation

Reference:
https://www.mathsisfun.com/algebra/quadratic-equation-graph.html

Suggested answer

```
import math

# Define coefficients
a = 1.15  # coefficient of x²
b = 0.1   # coefficient of x
c = -6.2  # constant term

# Method 1: Using quadratic formula
# Quadratic formula: x = (-b ± √(b² - 4ac)) / (2a)
discriminant = b**2 - 4*a*c

if discriminant < 0:
    print("No real roots exist (discriminant < 0)")
elif discriminant == 0:
    x = -b / (2*a)
    print(f"One real root: x = {x:.4f}")
else:
    x1 = (-b + math.sqrt(discriminant)) / (2*a)
    x2 = (-b - math.sqrt(discriminant)) / (2*a)
    print("Two real roots:")
    print(f"x1 = {x1:.4f}")
    print(f"x2 = {x2:.4f}")
```