GUI Development - Introduction

Error/ Warning

Information

Flashback

Class Exercise

AGENDA

1. Introduction to GUI Programming
2. GUI Programming, Installing Pycharm
3. Introduction to GUI Programming - Working on Pycharm

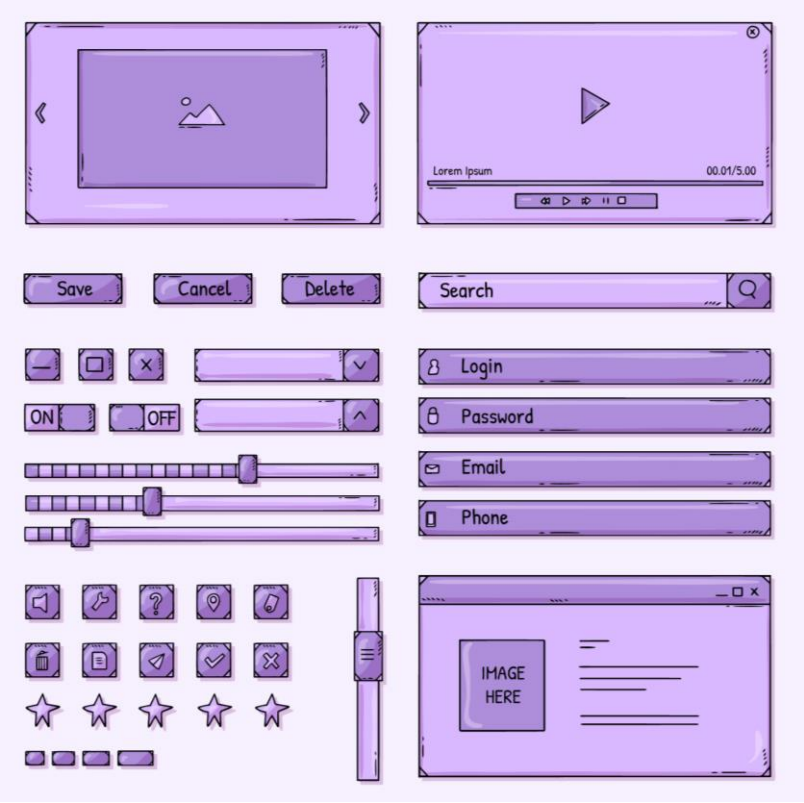
1. Introduction to GUI Programming

Introduction to GUI programming

What is GUI?

- A Graphical User Interface (GUI) is a type of user interface that allows users to interact with electronic devices through graphical elements rather than text-based commands.

- GUIs are designed to be intuitive and user-friendly, making it easier for users to understand and navigate software applications.



Introduction to GUI programming

Benefits of GUI?

- **User-Friendly**: More intuitive for users, especially those not familiar with command-line interfaces.
- **Accessibility**: Allows users of all skill levels to interact with software easily.
- **Efficiency**: Provides quick access to functions and features through visual elements.
- **Multitasking**: Users can manage multiple applications or tasks simultaneously in different windows.

Introduction to GUI programming

What is GUI programming?

GUI (Graphical User Interface) programming involves creating applications that have a visual interface through which users can interact.

Introduction to GUI programming

Key concepts in GUI programming?

Widgets: The building blocks of a GUI, such as buttons, labels, text boxes, and sliders.

Events: Actions triggered by user interactions, like clicking a button, moving a mouse, or pressing a key.

Event Loop: The mechanism that waits for and dispatches events or messages in a program. It runs continuously to keep the GUI responsive.

Layouts: Methods to arrange widgets within a window. Common layouts include grid, pack, and place.

Callbacks: Functions that are called in response to an event.

Introduction to GUI programming

Key widgets of GUI

- **Window**: Rectangular areas on the screen where content is displayed.
- **Icon**: Small graphical representations of programs, files, or functions that users can click.
- **Button**: Clickable elements that perform actions or commands.
- **Menu**: Lists of options or commands that drop down when selected.
- **Toolbar**: Strips of buttons or icons that provide quick access to commonly used functions.
- **Textbox**: Areas where users can input text.
- **Slider**: Controls that allow users to adjust values by sliding a knob along a bar.
- **Dialog**: Popup windows that prompt the user to make decisions or enter information.

2. GUI Programming and Installing PyCharm

GUI programming and installing PyCharm

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GUI programming

Python offers several libraries for creating GUIs, with the most popular ones being:

- Tkinter: Built-in Python library.
- PyQt/PySide: Set of Python bindings for the Qt libraries.
- Kivy: Open-source library for rapid development of applications.

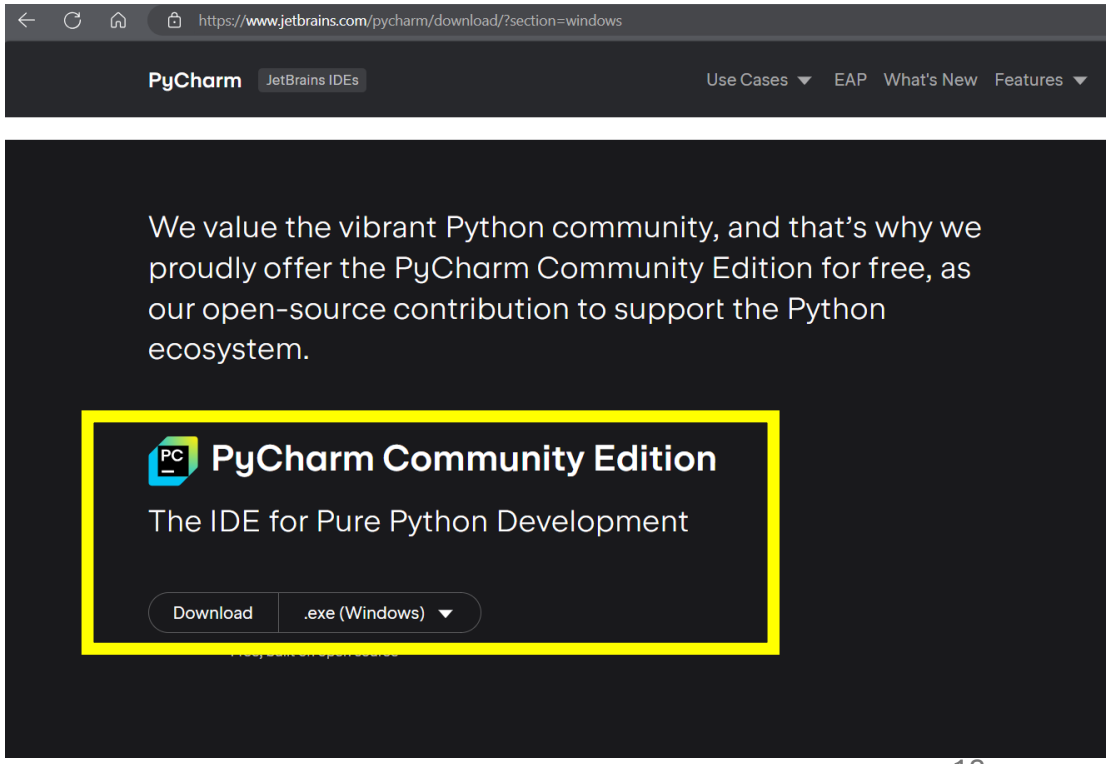
In this course we will learn Tkinter and for development will use PyCharm IDE.

GUI programming and installing PyCharm

Download PyCharm

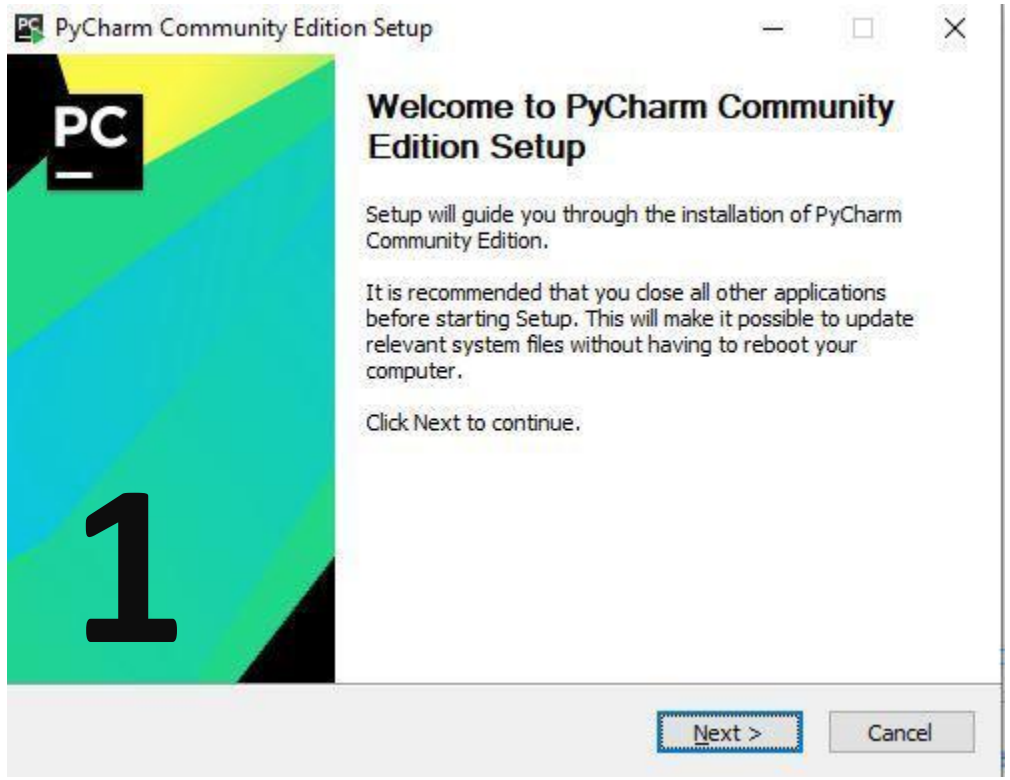
Visit the below link to download the PyChram Community edition.

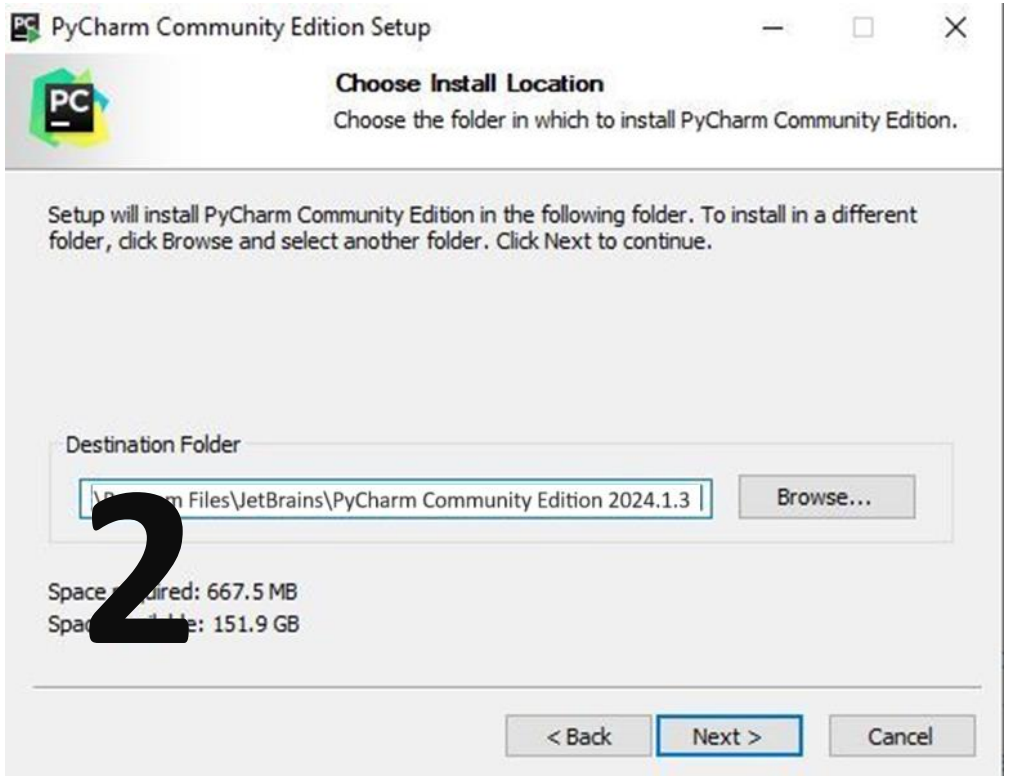
https://www.jetbrains.com/pycharm/download/?section=windows



GUI programming and installing PyCharm *(continued)*

Installing PyCharm





GUI programming and installing PyCharm *(continued)*

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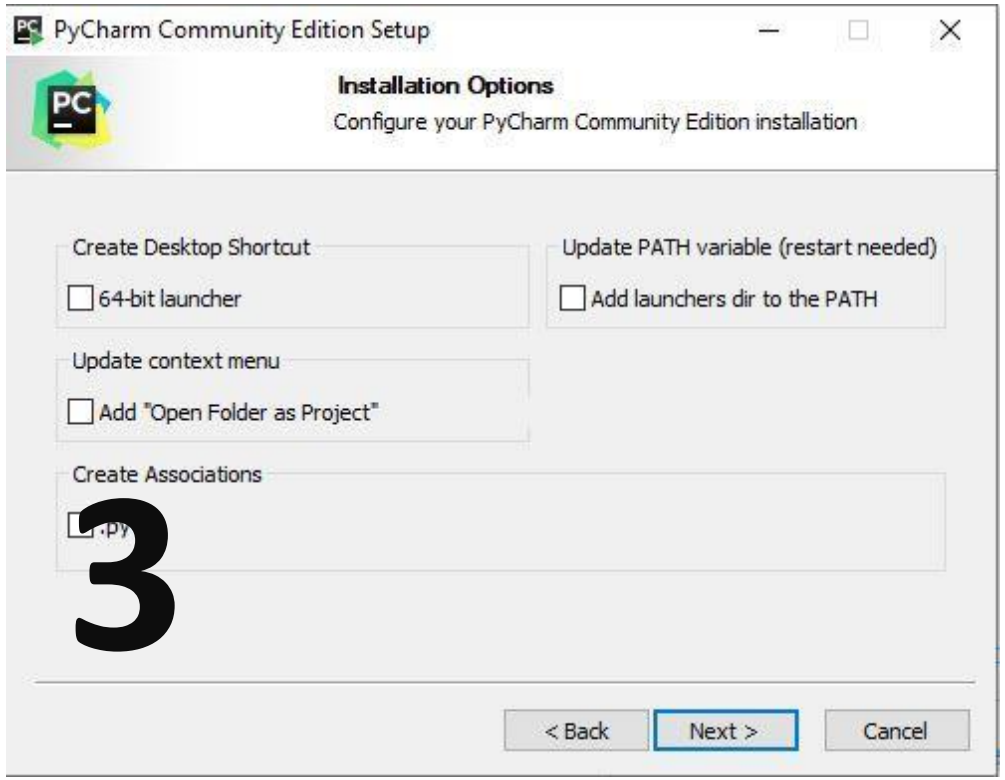
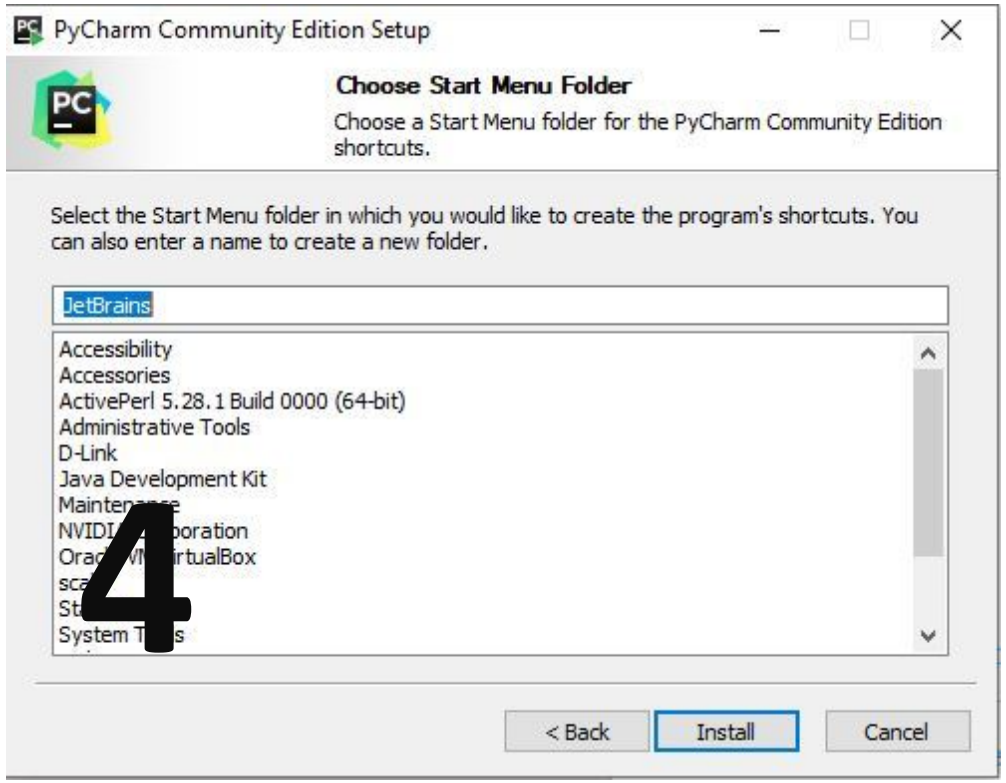
Installing PyCharm





GUI programming and installing PyCharm *(continued)*

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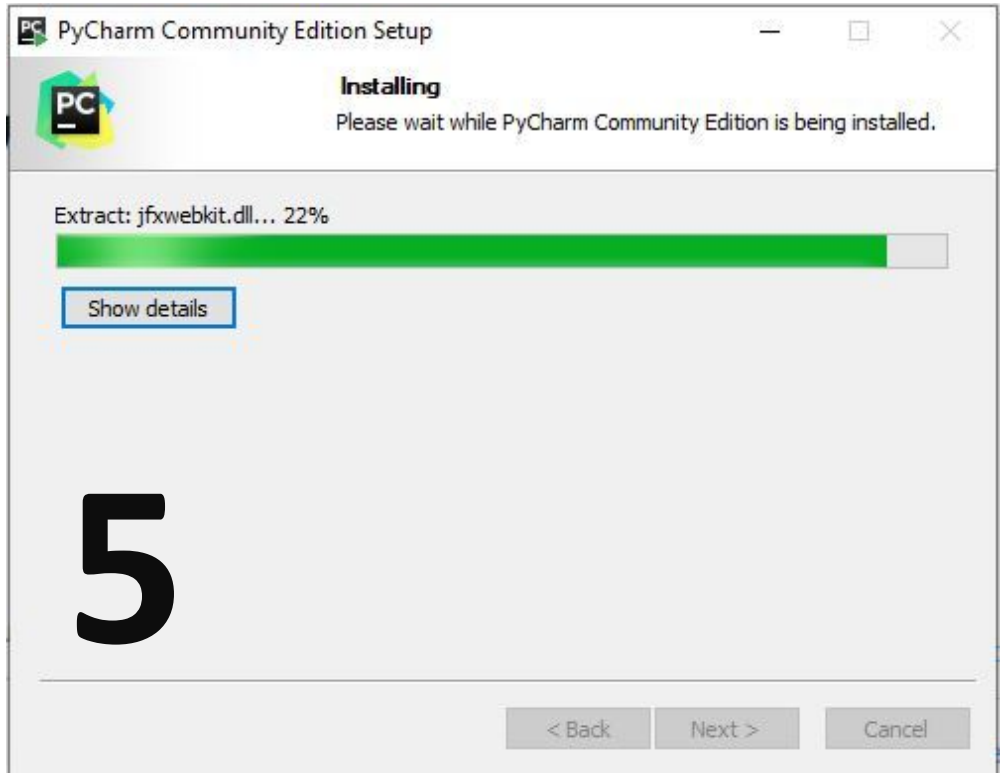
Installing PyCharm



3. Introduction to GUI Programming - Working on PyCharm

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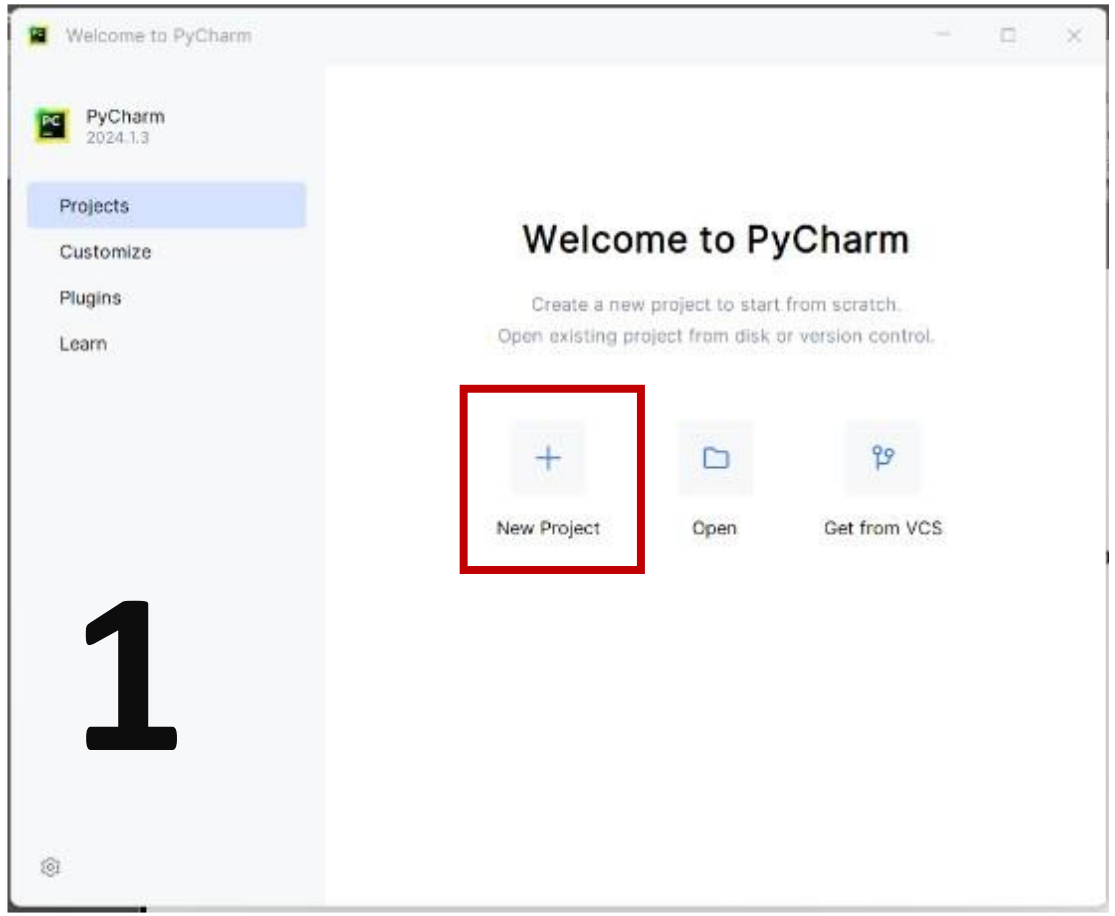
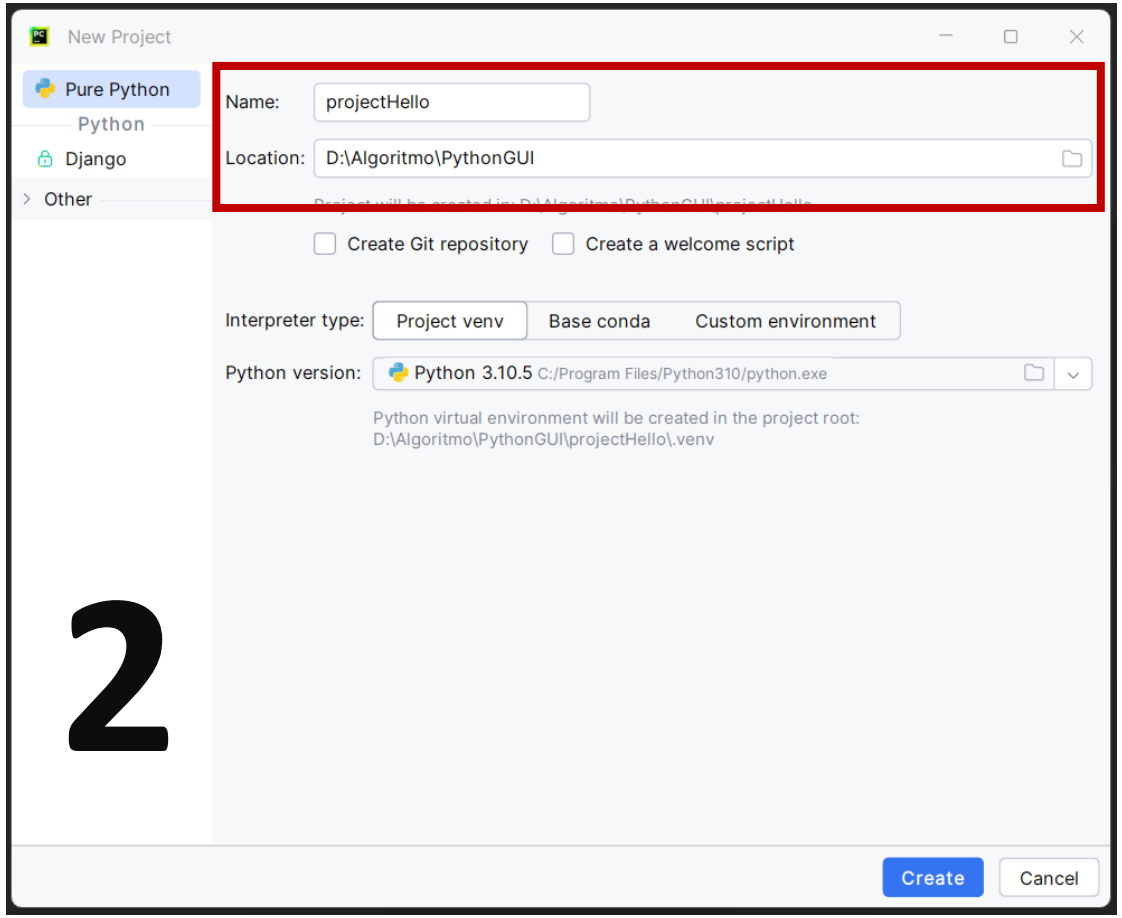
Working on PyCharm





Introduction to GUI Programming - Working on PyCharm

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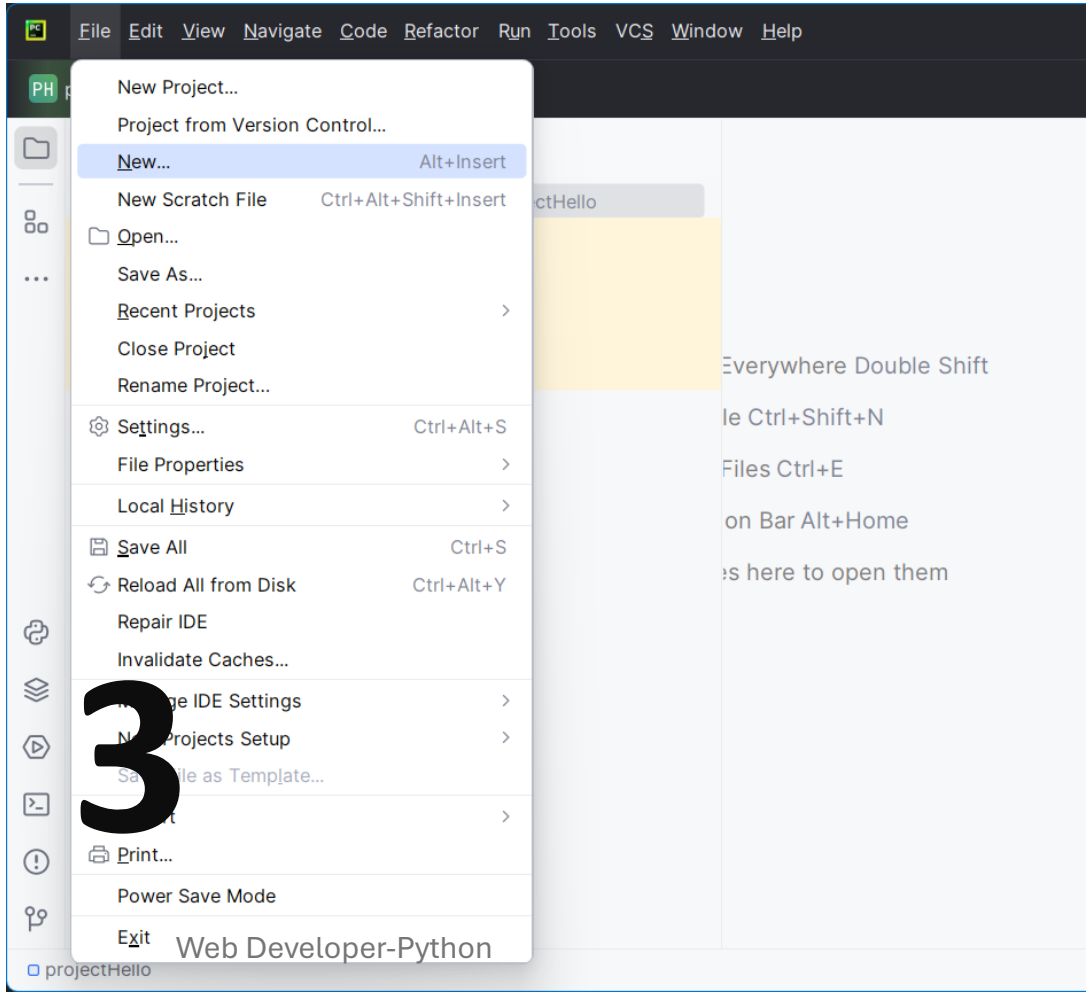
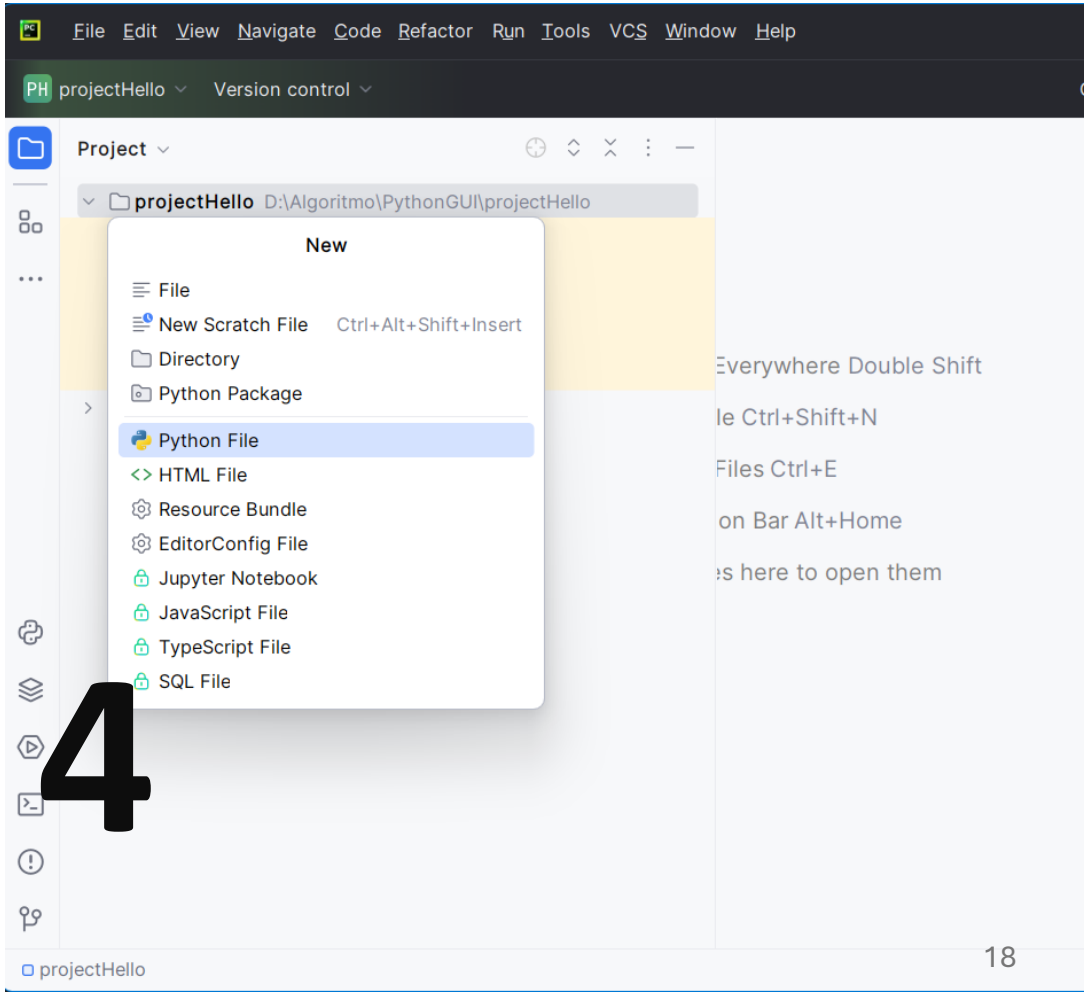
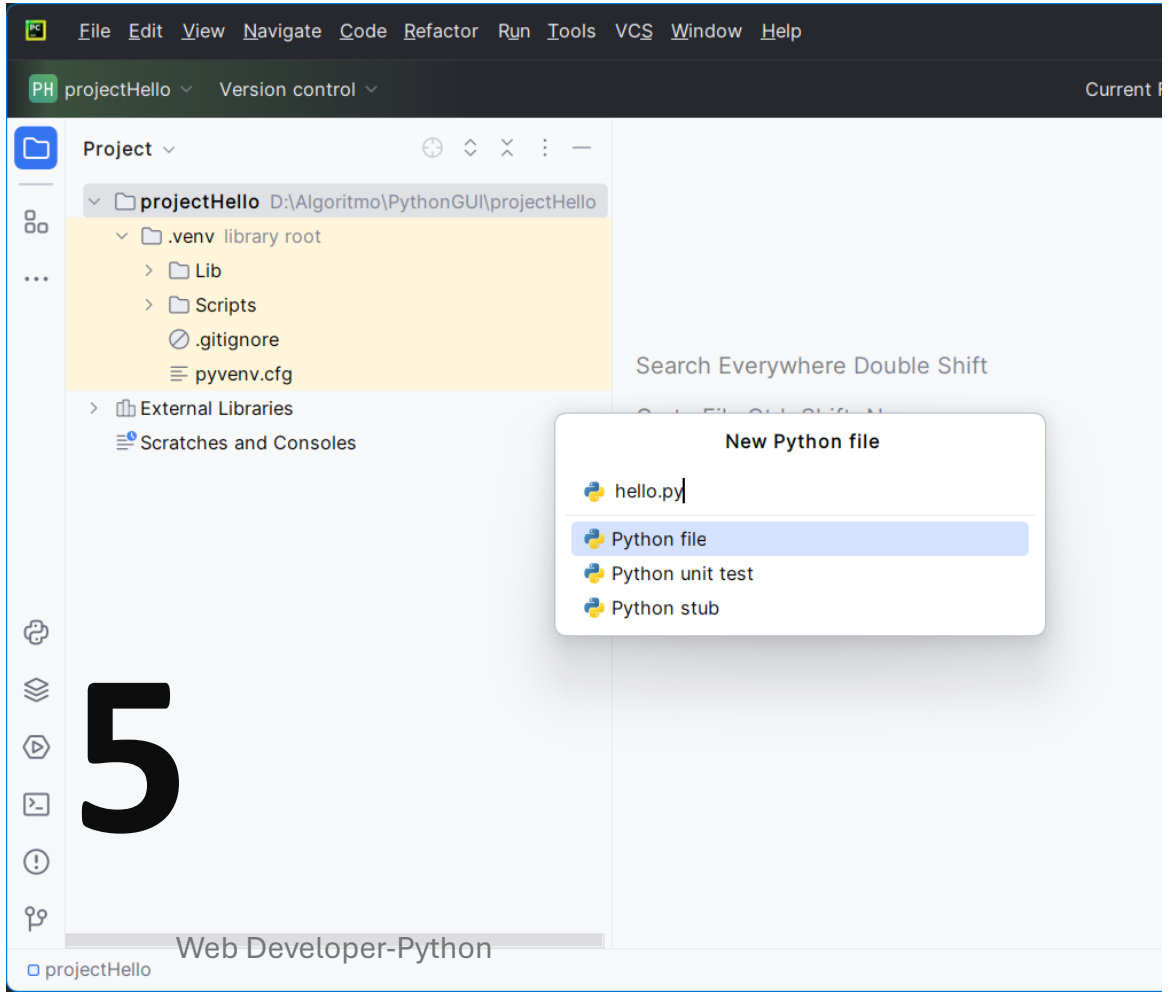
Working on PyCharm

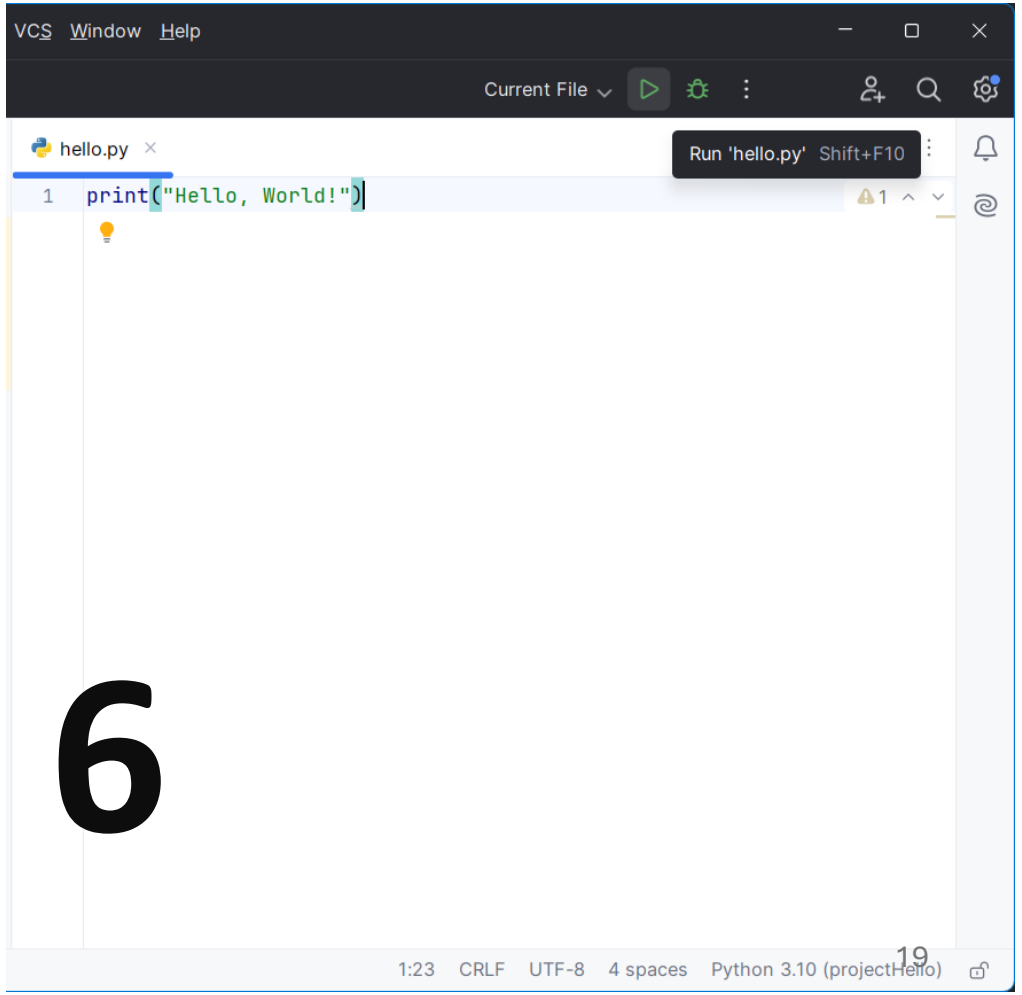




Introduction to GUI Programming - Working on PyCharm

Working on PyCharm





Introduction to GUI Programming - Working on PyCharm

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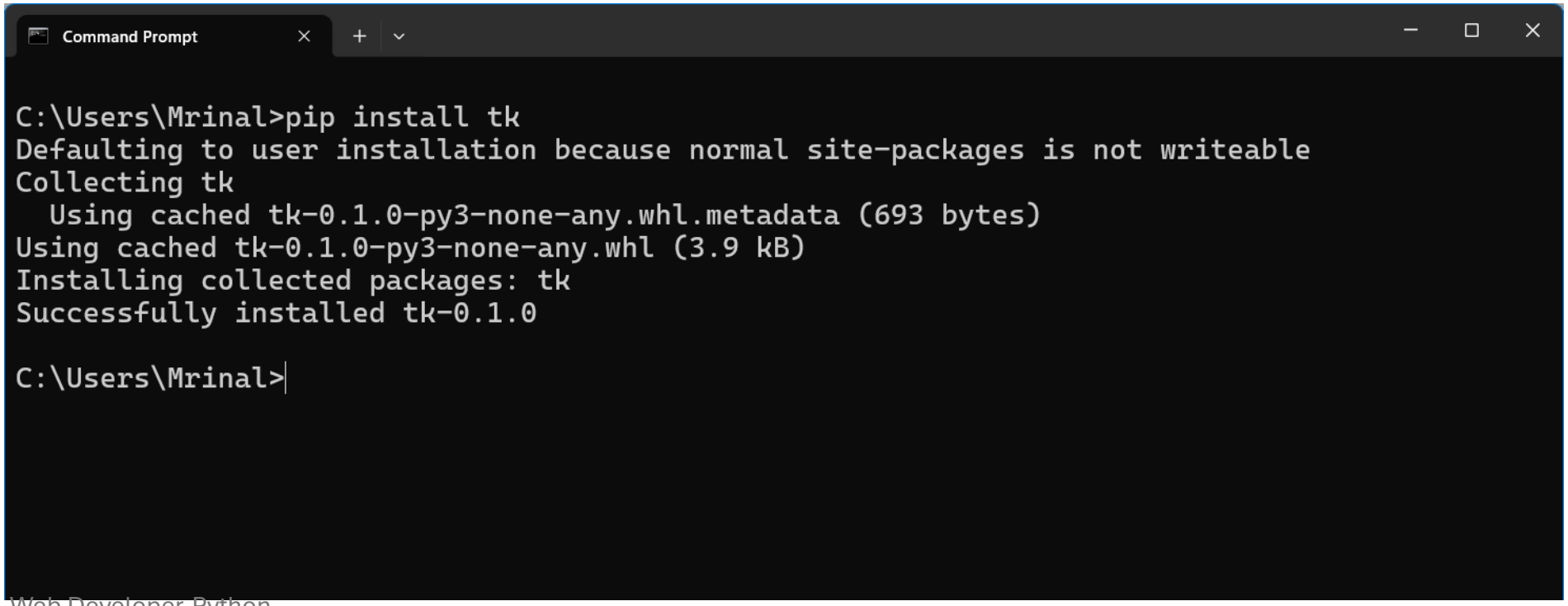
Installing Tkinter

Use `pip` on command prompt to install Tkinter on windows.

```
pip install tk
```



Introduction to GUI Programming - Working on PyCharm

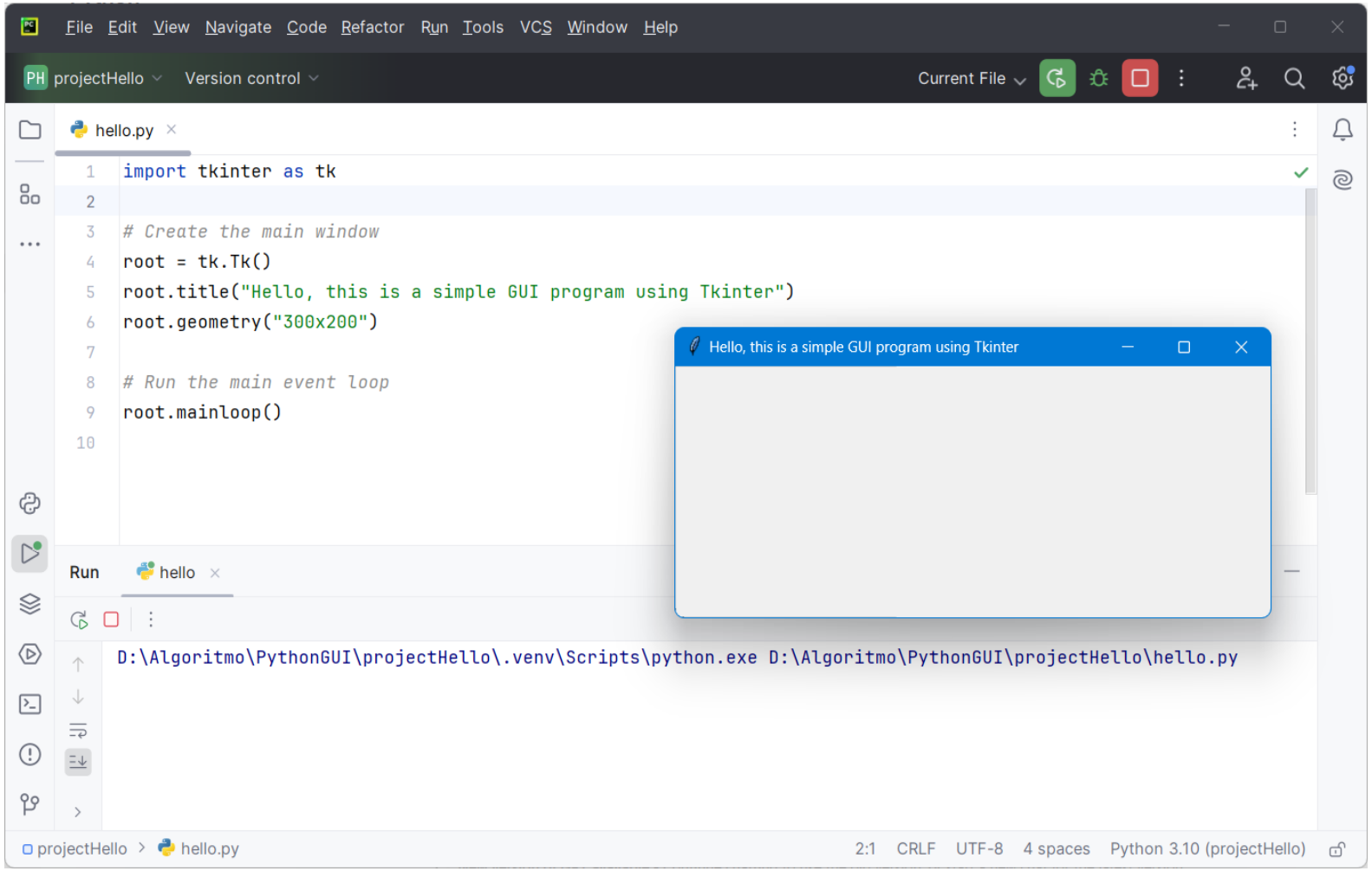
Creating a Simple Window:

`tk.Tk()`
Initializes the main window.

`root.title("Simple GUI")`
Sets the window title.

`root.geometry("300x200")`
Sets the window size.

`root.mainloop()`
Starts the event loop to keep the window open.



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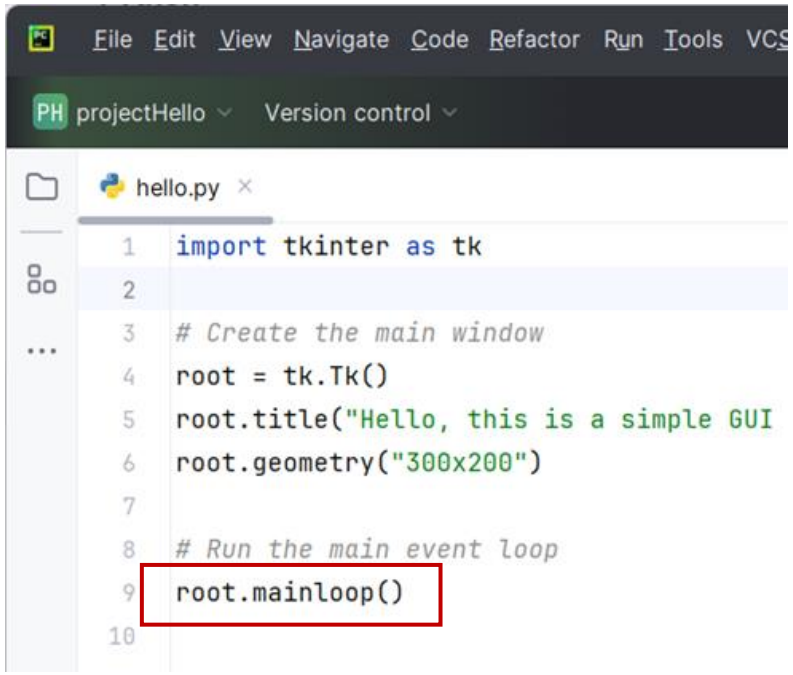
root.mainloop()

In Tkinter, root.mainloop() is a crucial function that starts the main event loop of the GUI application. This loop is responsible for handling all the events and updates within the application.



How it works?

Waiting for Events
Event loop waits for events like mouse click, key press and window action.

Handling Events
When an event occurs, it dispatches the event to the appropriate widget or handler function (e.g. - a button click executes its command).

Continuous Operation
The loop runs continuously until the application window is closed, keeping the GUI active and responsive.

GUI Development - Introduction

Case Study: Building a Simple Tkinter GUI Application

Scenario:
Create GUI - A window with title – “Welcome to Python GUI”

Steps to Create the GUI Application

1. Setup and Import: Install Python and ensure Tkinter is available.
2. Create the Main Window: Initialize the Tkinter window and set its properties.
3. Run the Event Loop: Keep the window open and responsive.

Question?

Thank you