Biocontrol modeling project: Environment Setup and Installation Manual

Autor

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Contents

1 Introduction

This guide provides a step-by-step visual tutorial to help you set up your development environment and run the project locally. Includes screenshots and detailed instructions for each step.

By the end of this guide, you will have:

- Installed Python and Visual Studio Code.
- Cloned the project repository directly from Visual Studio Code.
- Created and activated a virtual environment.
- Installed all the required Python libraries.

Make sure to follow each step carefully and verify that the output matches the screenshots provided.

2 Python Installation

Python is the programming language used in this project. Here is how to install it correctly on your computer.

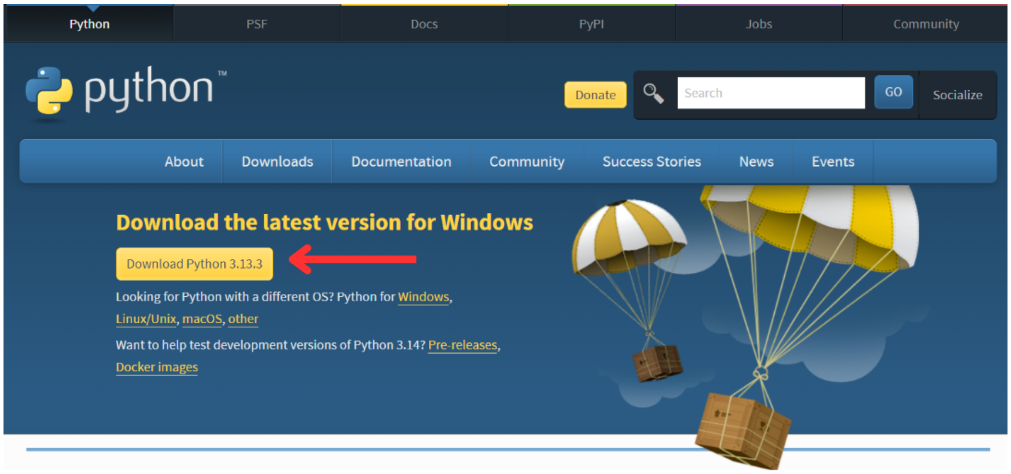
2.1 Step 1: Access to the official download page

Go to the official Python page using the following link:

`https://www.python.org/downloads/`

2.2 Step 2: Download the installer

A page will appear as the following:



Download the latest version for Windows

Looking for Python with a different OS? Python for Windows, Linux/Unix, macOS, other

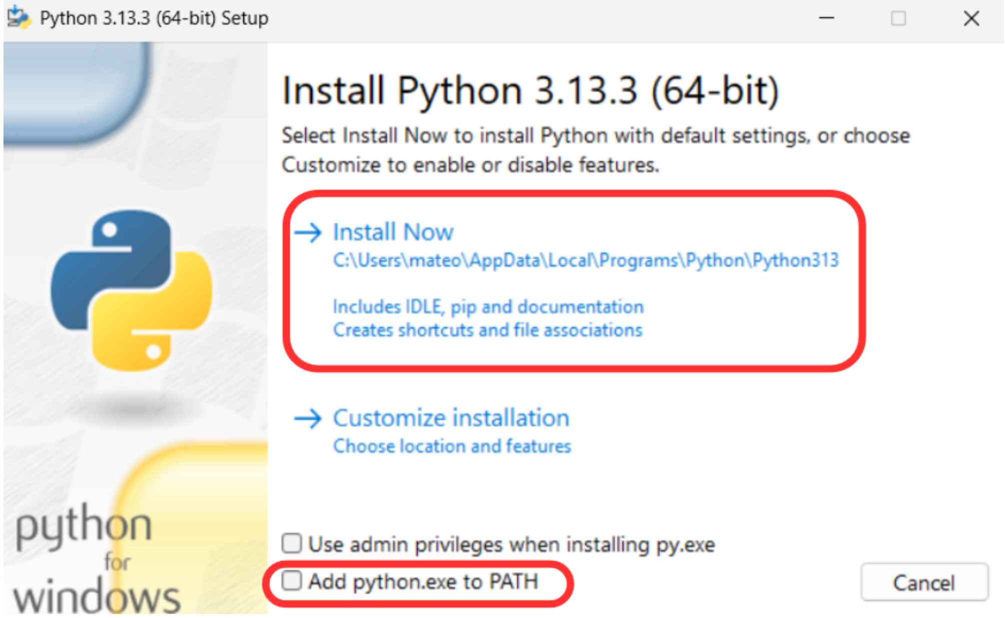
Want to help test development versions of Python 3.14? Pre-releases, Docker images

Figure 1: Python download official page.

Click the yellow button to start the Python download and wait for the download to finish.

2.3 Step 3: Execute the installer

When the download file is executed, the following window will appear.



Python 3.13.3 (64-bit) Setup

Install Python 3.13.3 (64-bit)

Select Install Now to install Python with default settings, or choose Customize to enable or disable features.

→ Install Now
C:\Users\mateo\AppData\Local\Programs\Python\Python313

Includes IDLE, pip and documentation
Creates shortcuts and file associations

→ Customize installation
Choose location and features

□ Use admin privileges when installing py.exe
□ Add python.exe to PATH

Figure 2: Python installer window.

1. Check the box that says **"Add python.exe to PATH"** (is essential for it to work from the terminal).
2. Then click on **"Install Now"**to start the installation.

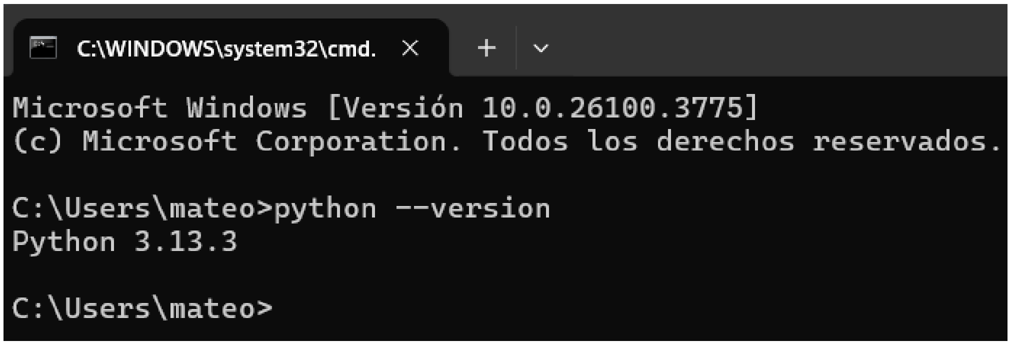
2.4 Step 4: Check the installation

Once the installation is complete, open the terminal (or cmd) and type the following command. You can type windows key + R to open the terminal.

```
python --version
```

If everything is correct, you will see the following message:

```
Python 3.13.3
```



```
Microsoft Windows [Versión 10.0.26100.3775]
(c) Microsoft Corporation. Todos los derechos reservados.

C:\Users\mateo>python --version
Python 3.13.3

C:\Users\mateo>
```

Figure 3: Command prompt showing the installed Python version.

3 Installing Visual Studio Code

Visual Studio Code (VS Code) is a lightweight and powerful code editor that supports Python development through extensions. In this section, you will learn how to download and install VS Code on your system.

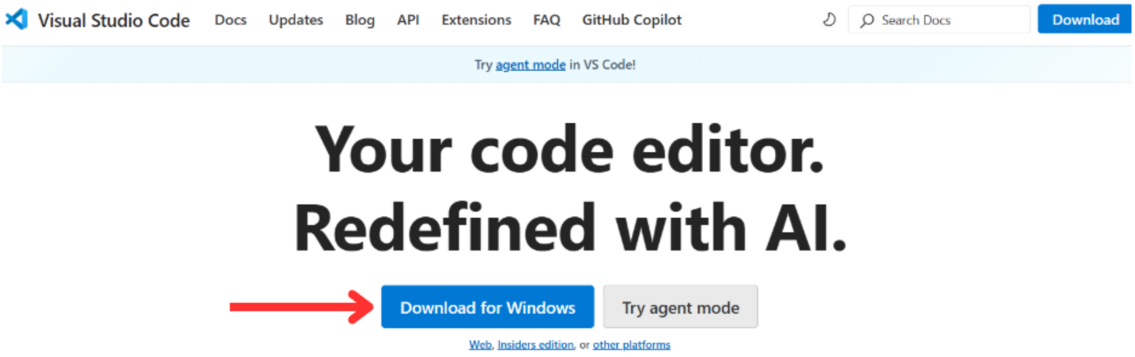
3.1 Step 1: Access to the official website

Go to the official Visual Studio Code website using the following link:

`https://code.visualstudio.com/`

3.2 Step 2: Download the installer

The homepage should look like the following image:



Try agent mode in VS Code!

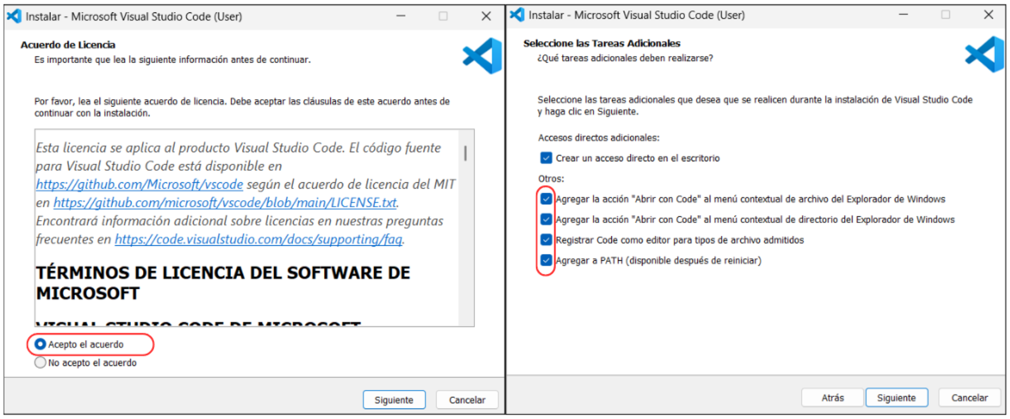
Your code editor. Redefined with AI.

Figure 4: VS Code download page for Windows.

1. Click on the **"Download for Windows"** button to download the installer.

3.3 Step 3: Run the installer

After downloading, open the installer file. The setup wizard will appear:



Acuerdo de Licencia

Es importante que lea la siguiente información antes de continuar.

Por favor, lea el siguiente acuerdo de licencia. Debe aceptar las cláusulas de este acuerdo antes de continuar con la instalación.

Esta licencia se aplica al producto Visual Studio Code. El código fuente para Visual Studio Code está disponible en https://github.com/Microsoft/vscode según el acuerdo de licencia del MIT en https://github.com/microsoft/vscode/blob/main/LICENSE.txt. Encontrará información adicional sobre licencias en nuestras preguntas frecuentes en https://code.visualstudio.com/docs/supporting/faq.

TÉRMINOS DE LICENCIA DEL SOFTWARE DE MICROSOFT

● Acepto el acuerdo

○ No acepto el acuerdo

Seleccione las Tareas Adicionales

¿Qué tareas adicionales deben realizarse?

Seleccione las tareas adicionales que desea que se realicen durante la instalación de Visual Studio Code y haga clic en Siguiente.

Accesos directos adicionales:

☑ Crear un acceso directo en el escritorio

Otros:

☑ Agregar la acción "Abrir con Code" al menú contextual de archivo del Explorador de Windows

☑ Agregar la acción "Abrir con Code" al menú contextual de directorio del Explorador de Windows

☑ Registrar Code como editor para tipos de archivo admitidos

☑ Agregar a PATH (disponible después de reiniciar)

Figure 5: VS Code installation setup window.

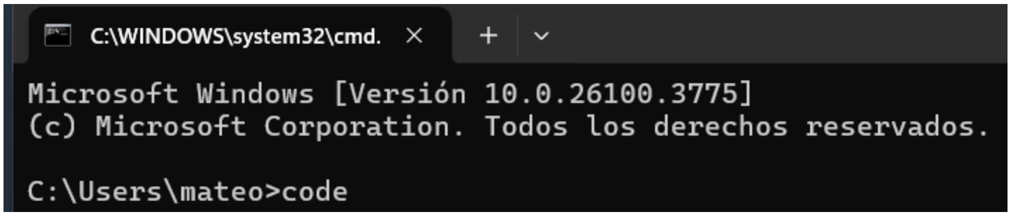
1. Accept the license agreement and click **"Next"**.
2. Choose the installation folder or leave the default, then click **"Next"**.
3. In the "Select Additional Tasks" step, make sure to check:
   - **"Add to PATH"**
   - **"Register Code as an editor for supported file types"**
   - **"Add 'Open with Code' action to Windows Explorer"**
4. Click **"Install"** to begin the installation.

3.4 Step 4: Launch VS Code

Once the installation is complete, you can open Visual Studio Code from the Start Menu or by typing:

```
code
```

in the command prompt (only if you added it to the PATH during setup).



```
Microsoft Windows [Versión 10.0.26100.3775]
(c) Microsoft Corporation. Todos los derechos reservados.

C:\Users\mateo>code
```

Figure 6: Opening VS Code from the terminal using `code`.

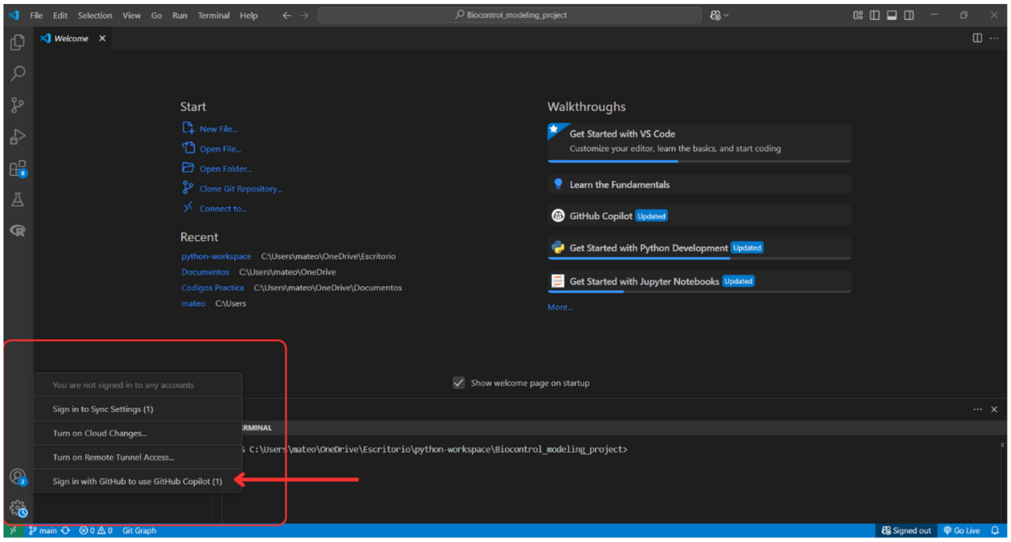
4 Cloning the GitHub Repository

Before you can clone the project repository, you need to have:

- Git installed on your system (see previous section).
- A GitHub account already created.
- You must be signed in to GitHub within Visual Studio Code.

4.1 Step 1: Sign in to GitHub in VS Code

Open Visual Studio Code. On the bottom-left corner, click on the account icon and select **"Sign in to GitHub"** or **"Sign in to GitHub to use GitHub copilot"**.


File
Edit
Selection
View
Go
Run
Terminal
Help
Biocontrol_modeling_project
Welcome
Start
New File...
Open File...
Open Folder...
Clone Git Repository...
Connect to...
Recent
python-workspace C:\Users\mateo\OneDrive\Escritorio
Documentos C:\Users\mateo\OneDrive
Codigos Practica C:\Users\mateo\OneDrive\Documentos
mateo C:\Users
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Learn the Fundamentals
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Get Started with Python Development Updated
Get Started with Jupyter Notebooks Updated
More...
Show welcome page on startup
You are not signed in to any accounts
Sign in to Sync Settings (1)
Turn on Cloud Changes...
Turn on Remote Tunnel Access...
Sign in with GitHub to use GitHub Copilot (1)
RMINAL
main
0 0
Git Graph
Signed out
Go Live

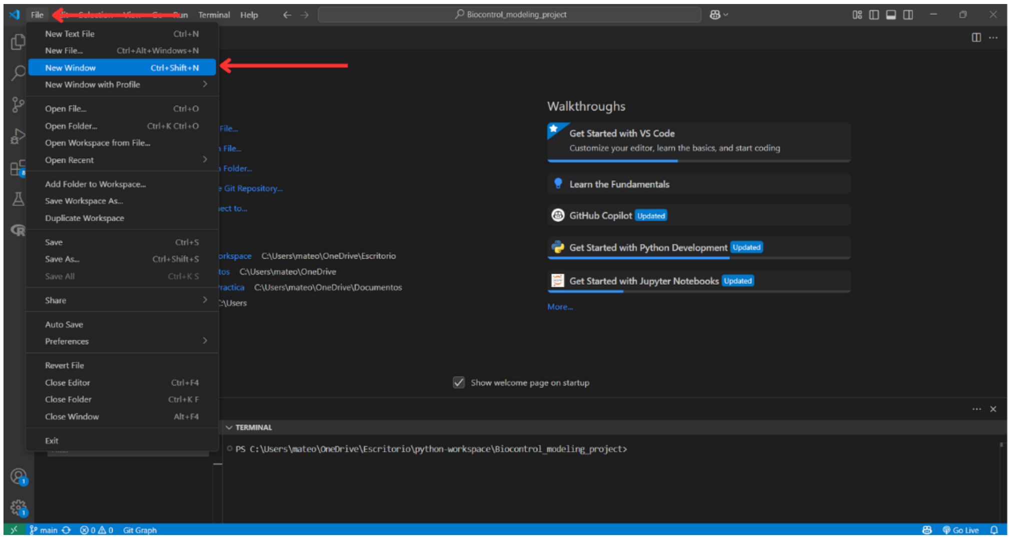
```
S C:\Users\mateo\OneDrive\Escritorio\python-workspace\Biocontrol_modeling_project>
```

Figure 7: Signing in to GitHub in VS Code.

Follow the prompts to complete the login process.

4.2 Step 2: Clone the repository

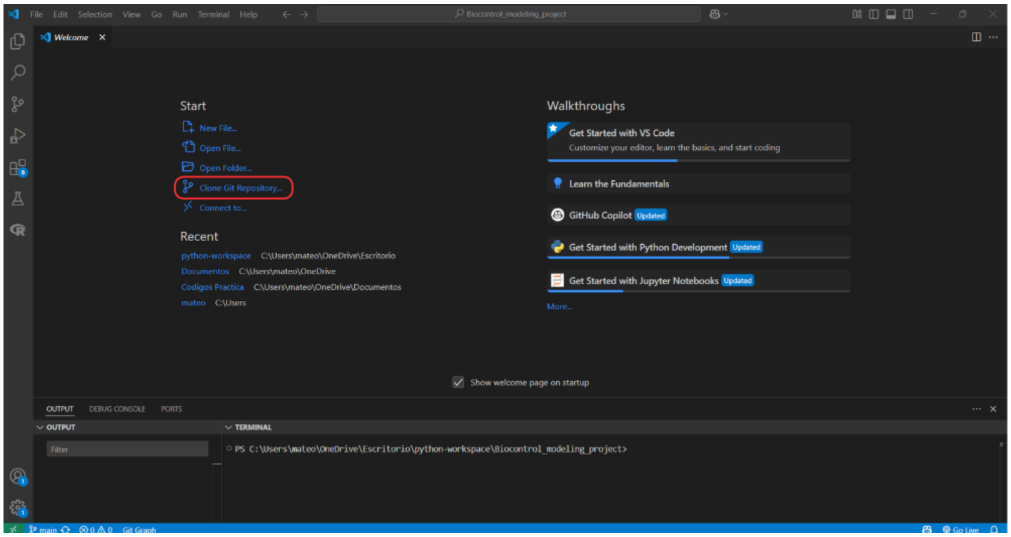
- Click on file section, then click on new window



```
PS C:\Users\mateo\OneDrive\Escritorio\python-workspace\Biocontrol_modeling_project>
```

Figure 8: Accessing the new window option in VS Code.

- Click on **Clone Git Repository...**


File Edit Selection View Go Run Terminal Help
Biocontrol_modeling_project
Welcome
Start
New File...
Open File...
Open Folder...
Clone Git Repository...
Connect to...
Recent
python-workspace C:\Users\mateo\OneDrive\Escritorio
Documentos C:\Users\mateo\OneDrive
Codigos Practica C:\Users\mateo\OneDrive\Documentos
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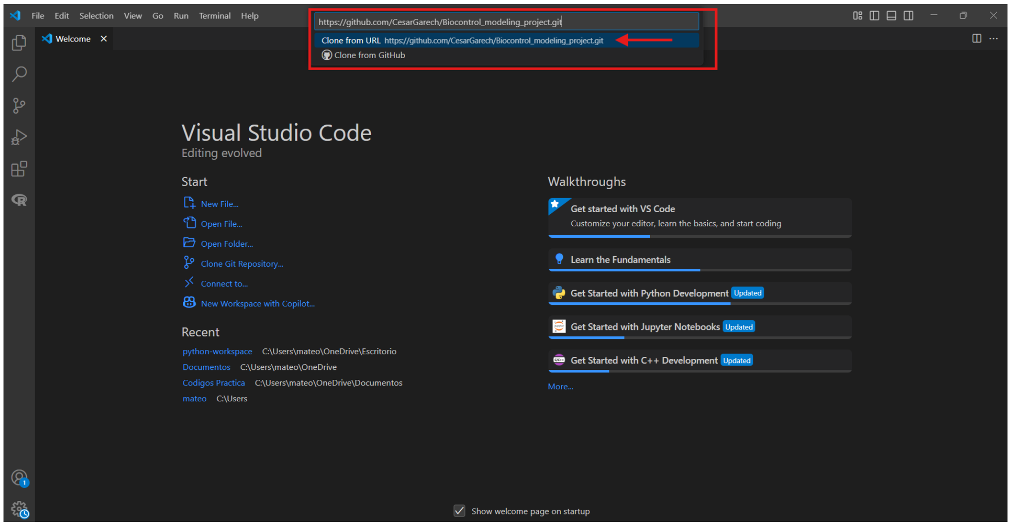
Learn the Fundamentals
GitHub Copilot Updated
Get Started with Python Development Updated
Get Started with Jupyter Notebooks Updated
More...
Show welcome page on startup
OUTPUT DEBUG CONSOLE PORTS
OUTPUT
Filter
TERMINAL
main
Git Graph
Go Live

```
PS C:\Users\mateo\OneDrive\Escritorio\python-workspace\Biocontrol_modeling_project>
```

Figure 9: Accessing to Clone Git Repository window.

- Paste the repository URL in the input box that appears at the top.



https://github.com/CesarGarech/Biocontrol_modeling_project.git

File
Edit
Selection
View
Go
Run
Terminal
Help
Clone from URL https://github.com/CesarGarech/Biocontrol_modeling_project.git
Clone from GitHub
Welcome
Visual Studio Code
Editing evolved
Start
New File...
Open File...
Open Folder...
Clone Git Repository...
Connect to...
New Workspace with Copilot...
Recent
python-workspace C:\Users\mateo\OneDrive\Escritorio
Documentos C:\Users\mateo\OneDrive
Codigos Practica C:\Users\mateo\OneDrive\Documentos
mateo C:\Users
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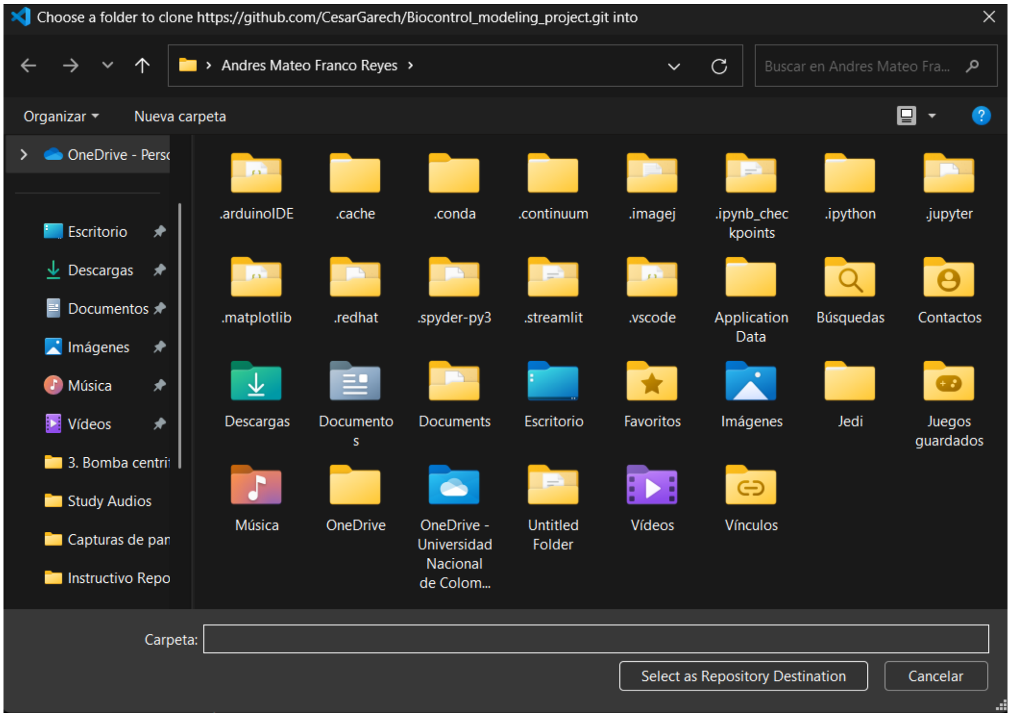
Get Started with C++ Development Updated
More...
Show welcome page on startup

Figure 10: Copy the url repository.

- Choose a folder on your local machine where the repository will be cloned.

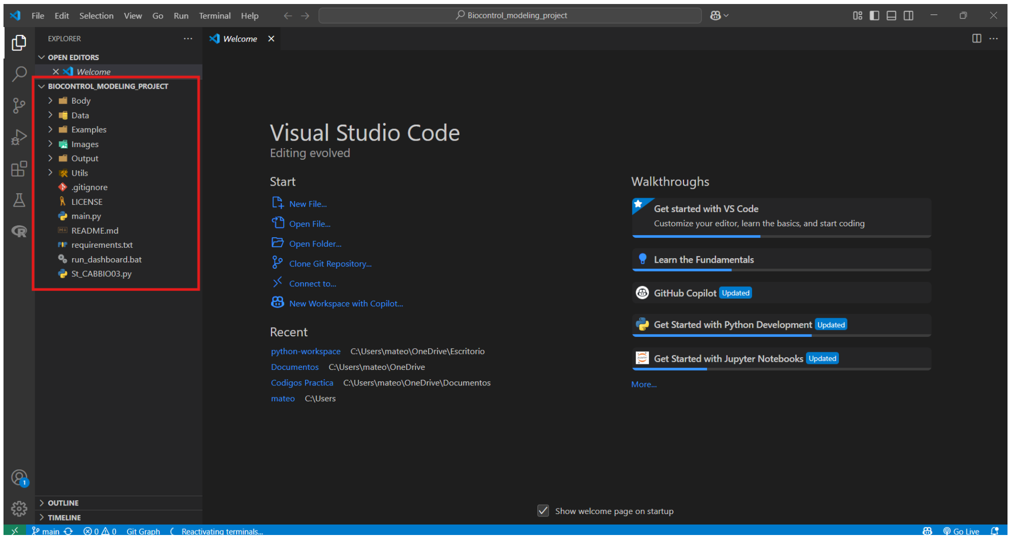


Choose a folder to clone https://github.com/CesarGarech/Biocontrol_modeling_project.git into

Figure 11: Choose a folder to cloned the repository.

4.3 Step 3: Confirm the project was cloned

Once you finish to choose a destination folder, you should see the project structure on the left panel (Explorer view). You can now start working with the code


File Edit Selection View Go Run Terminal Help
Biocontrol_modeling_project
EXPLORER
OPEN EDITORS
Welcome
BIOCONTROL_MODELING_PROJECT
Body
Data
Examples
Images
Output
Utils
.gitignore
LICENSE
main.py
README.md
requirements.txt
run_dashboard.bat
St_CABBIO03.py
OUTLINE
TIMELINE
Visual Studio Code
Editing evolved
Start
New File...
Open File...
Open Folder...
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Connect to...
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Get Started with Jupyter Notebooks Updated
More...
Show welcome page on startup
main
Git Graph
Reactivating terminals...
Go Live

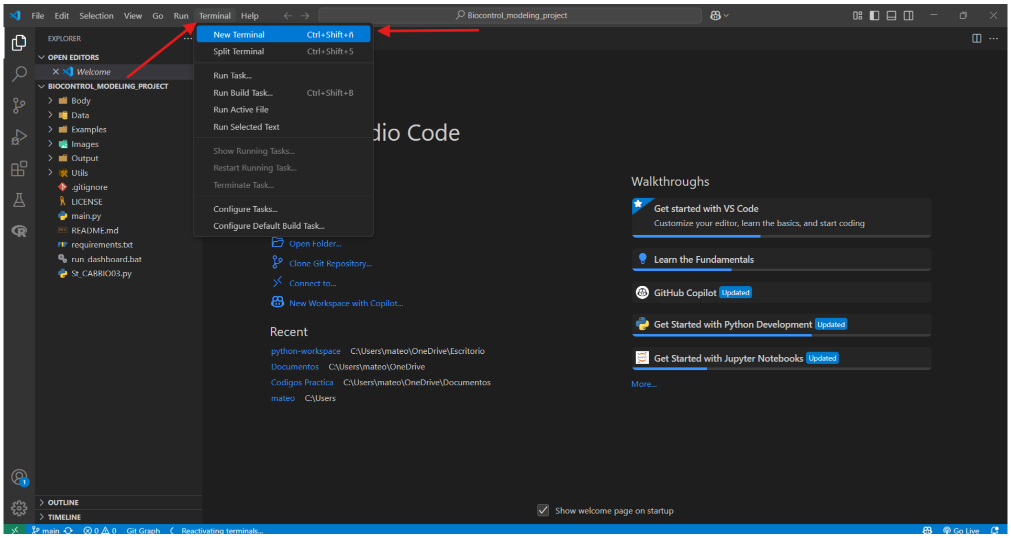
Figure 12: Repository cloned.

5 Creating and Activating the Virtual Environment

To isolate the project dependencies and avoid conflicts with global packages, it is recommended to use a virtual environment.

5.1 Step 1: Open the built-in terminal in VS Code

With the project opened in Visual Studio Code, go to **Terminal > New Terminal** to open the built-in terminal.


File Edit Selection View Go Run Terminal Help
Biocontrol_modeling_project
New Terminal Ctrl+Shift+ñ
Split Terminal Ctrl+Shift+5
Run Task...
Run Build Task... Ctrl+Shift+B
Run Active File
Run Selected Text
Show Running Tasks...
Restart Running Task...
Terminate Task...
Configure Tasks...
Configure Default Build Task...
EXPLORER
OPEN EDITORS
Welcome
BIOCONTROL_MODELING_PROJECT
Body
Data
Examples
Images
Output
Utils
.gitignore
LICENSE
main.py
README.md
requirements.txt
run_dashboard.bat
St_CABBIO03.py
OUTLINE
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dio Code
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Get Started with Python Development Updated
Get Started with Jupyter Notebooks Updated
More...
Show welcome page on startup
main
Git Graph
Reactivating terminals...
Go Live

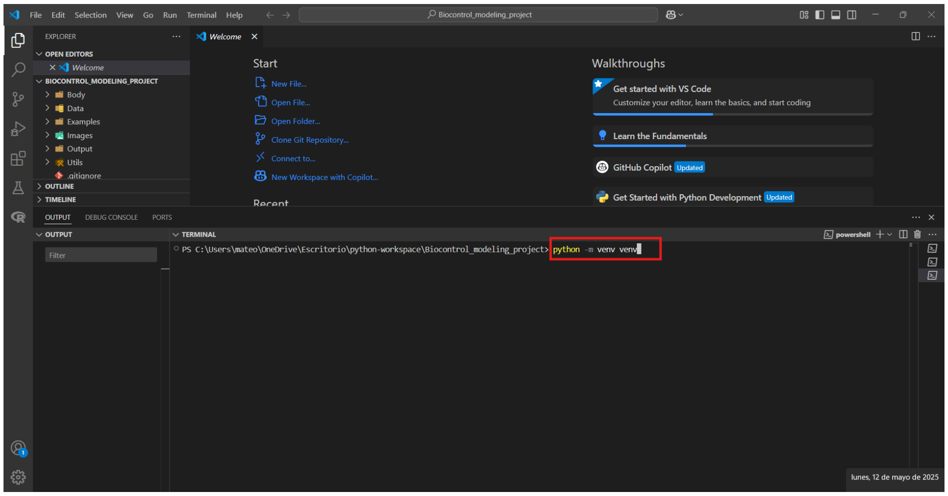
Figure 13: Opening the integrated terminal in VS Code.

5.2 Step 2: Create the virtual environment

In the terminal, type the following command and press `Enter`:

```
python -m venv venv
```

This will create a folder named ‘venv‘ containing the virtual environment.



```
PS C:\Users\mateo\OneDrive\Escritorio\python-workspace\Biocontrol_modeling_project> python -m venv venv
```

Figure 14: Creating the virtual environment.

5.3 Step 3: Activate the virtual environment

Depending on your operating system, use the appropriate command:

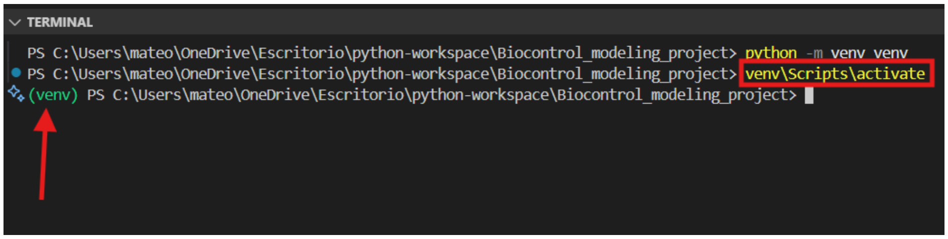
On Windows:

```
venv\Scripts\activate
```

On macOS / Linux:

```
source venv/bin/activate
```

Once activated, you will see the environment name (‘venv‘) in parentheses at the beginning of the terminal line.



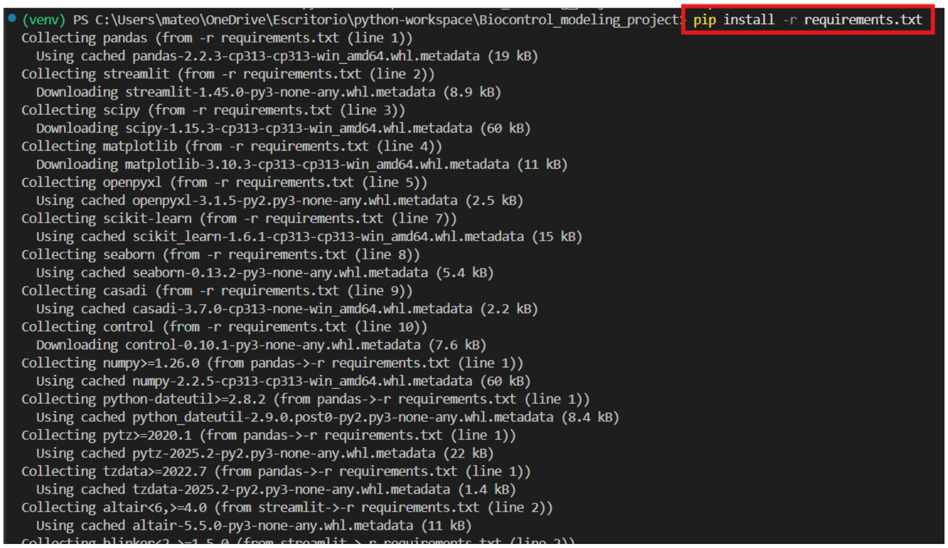
```
PS C:\Users\mateo\OneDrive\Escritorio\python-workspace\Biocontrol_modeling_project> python -m venv venv
PS C:\Users\mateo\OneDrive\Escritorio\python-workspace\Biocontrol_modeling_project> venv\Scripts\activate
(venv) PS C:\Users\mateo\OneDrive\Escritorio\python-workspace\Biocontrol_modeling_project>
```

Figure 15: Virtual environment activated in the terminal.

5.4 Step 4: Install the required dependencies

If your project includes a `requirements.txt` file, run the following command to install the required libraries:

```
pip install -r requirements.txt
```



```
(venv) PS C:\Users\mateo\OneDrive\Escritorio\python-workspace\Biocontrol_modeling_project> pip install -r requirements.txt
  Collecting pandas (from -r requirements.txt (line 1))
    Using cached pandas-2.2.3-cp313-cp313-win_amd64.whl.metadata (19 kB)
  Collecting streamlit (from -r requirements.txt (line 2))
    Downloading streamlit-1.45.0-py3-none-any.whl.metadata (8.9 kB)
  Collecting scipy (from -r requirements.txt (line 3))
    Downloading scipy-1.15.3-cp313-cp313-win_amd64.whl.metadata (60 kB)
  Collecting matplotlib (from -r requirements.txt (line 4))
    Downloading matplotlib-3.10.3-cp313-cp313-win_amd64.whl.metadata (11 kB)
  Collecting openpyxl (from -r requirements.txt (line 5))
    Using cached openpyxl-3.1.5-py2.py3-none-any.whl.metadata (2.5 kB)
  Collecting scikit-learn (from -r requirements.txt (line 7))
    Using cached scikit_learn-1.6.1-cp313-cp313-win_amd64.whl.metadata (15 kB)
  Collecting seaborn (from -r requirements.txt (line 8))
    Using cached seaborn-0.13.2-py3-none-any.whl.metadata (5.4 kB)
  Collecting casadi (from -r requirements.txt (line 9))
    Using cached casadi-3.7.0-cp313-none-win_amd64.whl.metadata (2.2 kB)
  Collecting control (from -r requirements.txt (line 10))
    Downloading control-0.10.1-py3-none-any.whl.metadata (7.6 kB)
  Collecting numpy>=1.26.0 (from pandas->-r requirements.txt (line 1))
    Using cached numpy-2.2.5-cp313-cp313-win_amd64.whl.metadata (60 kB)
  Collecting python-dateutil>=2.8.2 (from pandas->-r requirements.txt (line 1))
    Using cached python_dateutil-2.9.0.post0-py2.py3-none-any.whl.metadata (8.4 kB)
  Collecting pytz>=2020.1 (from pandas->-r requirements.txt (line 1))
    Using cached pytz-2025.2-py2.py3-none-any.whl.metadata (22 kB)
  Collecting tzdata>=2022.7 (from pandas->-r requirements.txt (line 1))
    Using cached tzdata-2025.2-py2.py3-none-any.whl.metadata (1.4 kB)
  Collecting altair<6,>=4.0 (from streamlit->-r requirements.txt (line 2))
    Using cached altair-5.5.0-py3-none-any.whl.metadata (11 kB)
  Collecting blinker<2,>=1.5.0 (from streamlit->-r requirements.txt (line 2))
```

Figure 16: Installing the dependencies listed in `requirements.txt`.