



INSTITUTO TECNOLÓGICO Y DE ESTUDIOS SUPERIORES
DE MONTERREY
CAMPUS GUADALAJARA

Introducción a la Programación Programación básica I (Python)

Apuntes de clase

Impartido por:

Dr. Eduardo de Jesús Dávila Meza

para el grupo:

PS5005.401

para estudiantes de:

Quinto Semestre

de la Escuela de:

PrepaTec

Zapopan, Jalisco, México. Agosto - Noviembre 2025.

Contents

Contents	iii
List of Acronyms and Special Terms	v
1 Environment Setup and Development Tools	1
1.1 Introduction	1
1.1.1 An Introduction to Python	1
1.1.2 Some Ubuntu Distributions and Their Python Versions	2
1.1.3 Ubuntu Distribution and Python Version for the Course	2
1.2 Installation of Ubuntu 22.04 LTS (Jammy Jellyfish)	3
1.2.1 Installation of Ubuntu 22 Using the Universal USB Installer	3
1.2.2 First Steps After Installing Ubuntu 22	4
1.3 Configuring the Development Environment	4
1.3.1 Installing Visual Studio Code	4
1.3.2 Installing Recommended VS Code Extensions	4
1.4 Extra: Some Useful Terminal Programs in Ubuntu	5
1.5 Practice Assignment 1: Bootable USB Creation	6
1.5.1 Steps to Create the Bootable USB - For Windows Users	6
1.5.2 Steps to Open Disk Utility - For Mac Users	6
1.5.3 Submission Instructions	6
1.6 Practice Assignment 2: VS Code & Ubuntu Terminal	8
1.6.1 VS Code Session	8
1.6.2 Commands in Ubuntu Terminal	8
1.6.3 Submission Instructions	8

List of Acronyms and Special Terms

Acronyms

L

LTS Long-Term Support. — Page: [2](#).

V

VS Code Visual Studio Code. — Page: [4](#).

CHAPTER

Environment Setup and Development Tools

Author: Dr. Eduardo de Jesús Dávila Meza.

 [EduardoDavila-AI](#) 

 **Abstract** - This chapter guides you through the setup of their programming environment for the course **Introduction to Programming - Programming Basics I (Python)**.

The objectives are:

- Understand the Python language's role and brief history.
 - Identify suitable operating system and Python versions for development.
 - Install and configure [Ubuntu 22.04 LTS](#) and required development tools.
 - Set up [Visual Studio Code](#) with essential extensions for Python development.
 - Explore fun and educational terminal programs.
 - Complete a practice task to verify the environment setup.
-

1.1 Introduction

1.1.1 An Introduction to Python

Python is a high-level, interpreted, general-purpose programming language created by Guido van Rossum and first released in 1991. Its design philosophy emphasizes code readability and simplicity, making it a popular choice for both beginners and professionals. It supports multiple programming paradigms, including procedural, object-oriented, and functional programming. Python has a large standard library, active community support, and is widely used in fields such as:

- Web development
- Data science and machine learning
- Automation and scripting
- Software testing
- Education

1.1.2 Some Ubuntu Distributions and Their Python Versions

Table 1.I shows some [Long-Term Support \(LTS\)](#) Ubuntu releases along with their default Python versions.

Ubuntu Version	Codename	Default Python Version
16.04 LTS	Xenial Xerus	Python 2.7 & Python 3.5
18.04 LTS	Bionic Beaver	Python 3.6
20.04 LTS	Focal Fossa	Python 3.8
22.04 LTS	Jammy Jellyfish	Python 3.10
24.04 LTS	Noble Numbat	Python 3.12

Table 1.I: Ubuntu LTS versions and their default Python versions

For more details, see the [Ubuntu Releases list](#). Currently, the Focal Fossa (20.04), Jammy Jellyfish (22.04), and Noble Numbat (24.04) distributions are actively supported.

1.1.3 Ubuntu Distribution and Python Version for the Course

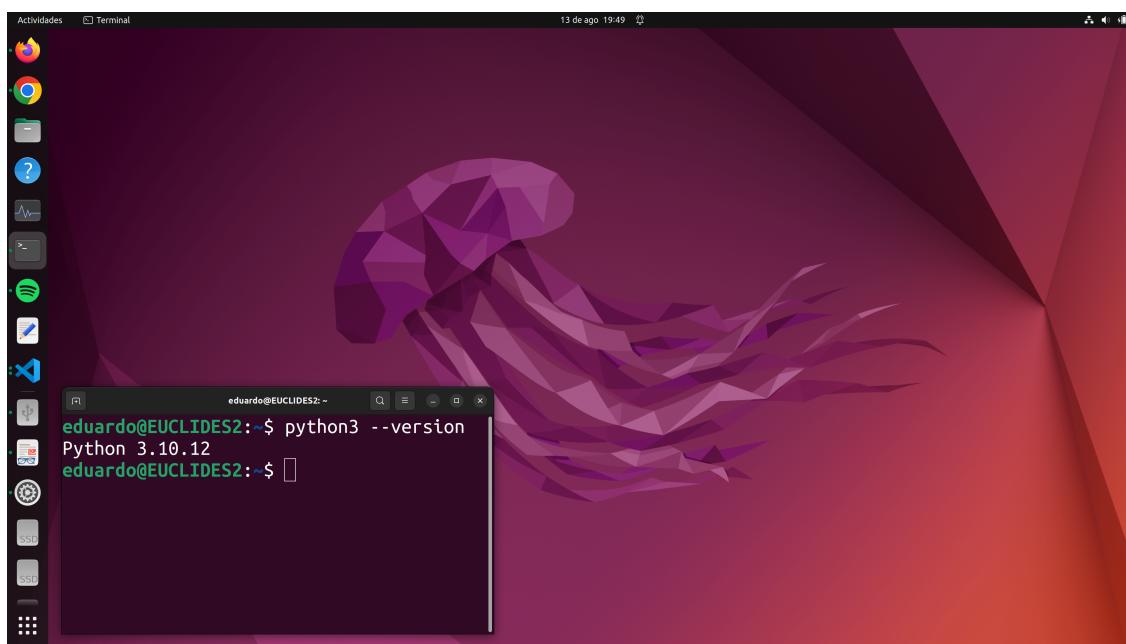


Figure 1.1: Ubuntu 22.04 LTS Jammy Jellyfish with Python 3.10.

For this course, we will use:

- **Operating System:** Ubuntu 22.04 LTS (Jammy Jellyfish),
- **Python Version:** Python 3.10

as shown in Figure 1.1. This combination ensures stability, compatibility with educational resources, and up-to-date features without sacrificing reliability.

1.2 Installation of Ubuntu 22.04 LTS (Jammy Jellyfish)

1.2.1 Installation of Ubuntu 22 Using the Universal USB Installer

1. Download the Universal USB Installer

Visit the [Uptodown website](#) to download the [Universal USB Installer](#), version 2.0.1.4, on [Windows](#).

2. Download the Ubuntu ISO

Download the Ubuntu 22.04.5 LTS (Jammy Jellyfish) ISO - *64-bit PC (AMD64) desktop image*, from the official release page: [Ubuntu releases](#).

3. Create a Bootable USB Drive

Insert a USB drive (minimum 8 GB) and use the Universal USB Installer tool with the downloaded ISO to create a bootable USB stick. Follow the on-screen prompts to properly set up the drive. You may also follow the instructions provided by your instructor, the official guide: [Universal USB Installer](#), or refer to this tutorial: [YouTube Guide](#).

4. Prepare Your Machine (if dual-booting with Windows)

If you are keeping Windows and installing Ubuntu alongside it, you should free some unallocated disk space before installation:

- Defragment the C: drive.
- Additionally, you can shrink the Windows partition to create at least 64 GB of unallocated space (advanced installation).
- If the volume reduction fails, delete old restore points to free up additional space. See, for example, this tutorial: [Windows - Shrinking hard disk volume to create new partition](#).

5. Install Ubuntu on Your Machine

Boot the target computer from the USB drive. Follow the Ubuntu installation wizard to install Ubuntu 22.04 LTS and configure your system settings as needed:

- Select language and keyboard layout.
- Connect to a network (optional during installation).
- Choose installation type (*Normal* or *Minimal*).
- Allocate disk space (at least 64 GB) if you want to *Install Ubuntu alongside Windows* or select *Erase disk and install Ubuntu*.
- Create a user account, password, and set the hostname.



1.2.2 First Steps After Installing Ubuntu 22

Open a terminal from the application menu by typing `terminal` or by pressing **Ctrl+Alt+T**, and then:

- Update the system:

```
$ sudo apt update && sudo apt upgrade -y
```

- Check the installed Python version:

```
$ python3 --version
```

1.3 Configuring the Development Environment

With the following tools and extensions, your development environment will be well-equipped for Python projects.

1.3.1 Installing Visual Studio Code

[Visual Studio Code \(VS Code\)](#) is a versatile code editor that supports various programming languages and development environments. To install it on Ubuntu 22.04, follow these steps:

1. Using the Ubuntu Software Center

- Open the *Ubuntu Software* application from the application menu.
- In the search bar, type [Visual Studio Code](#).
- Locate [Visual Studio Code](#) in the search results and click *Install*.

2. Using the Official .deb Package

- Visit the official [VS Code](#) download page: code.visualstudio.com.
- Click on the **.deb** package suitable for Debian/Ubuntu.
- Once downloaded, open a terminal (**Ctrl+Alt+T**) and navigate to the directory containing the downloaded file.
- Install the package using:

```
$ sudo apt install ./<file>.deb
```

Replace **<file>** with the actual filename.

These methods ensure that [VS Code](#) is added to your system repositories and receives updates automatically.

1.3.2 Installing Recommended VS Code Extensions

Enhance your development experience by installing the following [VS Code](#) extensions:

- **Error Lens** by *Alexander* - Highlights error and warning messages inline in the code editor.



- **Indent-Rainbow** by *oderwat* - Highlights indentation levels with different colors.
- **Jupyter** by *Microsoft* - enables notebook support with Jupyter notebooks, allowing any Python environment to be used as a Jupyter kernel.
- **Python (and Pylance)** by *Microsoft* - Provides rich support for Python, including features such as IntelliSense, linting, and debugging.
- **vscode-icons** by *VSCodium Icons Team* - Adds file icons for better visual identification.

To install these extensions:

1. Open VS Code from the application menu by typing `code`.
2. Navigate to the *Extensions* view by clicking on the square icon (⧉) in the sidebar or pressing **Ctrl+Shift+X**.
3. Search for each extension by name and click *Install*.

1.4 Extra: Some Useful Terminal Programs in Ubuntu

Try installing and running:

- **Neofetch** — displays system information in ASCII art.

```
$ sudo apt install neofetch  
$ neofetch
```

- **Htop** — interactive process viewer.

```
$ sudo apt install htop  
$ htop
```

- **Hollywood** (optional) — creates a “Hollywood movie hacking” terminal effect.

```
$ sudo apt install hollywood  
$ hollywood
```



1.5 Practice Assignment 1: Bootable USB Creation

In this assignment, you will create a bootable USB drive with the ISO image of [Ubuntu 22.04 LTS \(Jammy Jellyfish\)](#) using the *Universal USB Installer* (Windows). After completing the process, you must capture a screenshot showing the folders and files created in the USB drive. This evidence will be submitted in the designated assignment area on Canvas as an image file. The filename must follow the format:

FirstnameLastname_s1_e1.png,

where **s1** corresponds to the session number and **e1** is the evidence number. For example:

EduardoDavila_s1_e1.png.

1.5.1 Steps to Create the Bootable USB - For Windows Users

1. Download the Universal USB Installer, version [2.0.1.4](#), from: [uptodown.com](#).
2. Download the Ubuntu 22.04.5 LTS (Jammy Jellyfish) ISO - *64-bit PC (AMD64) desktop image* - from: [Ubuntu releases](#).
3. Insert a USB drive (minimum 8 GB) and format it with the default settings ([FAT32/exFAT](#) properties).
4. Run the Universal USB Installer to create the bootable USB stick, as described in Section [1.2.1](#). You may also follow the official guide: [Universal USB Installer](#), or refer to this tutorial: [YouTube Guide](#).
5. After completion, open the USB drive in [File Explorer](#) and verify that the Ubuntu boot files and folders (such as **boot**, **EFI**, **casper**, etc.) were created.

1.5.2 Steps to Open Disk Utility - For Mac Users

1. Open the built-in [Disk Utility](#) app to visualize the disk properties of your machine. You may watch this tutorial: [YouTube Guide](#).
2. Remember to bring your [USB Type-C to USB Type-A adapter](#) to the next class so you can complete the installation on your machine.

1.5.3 Submission Instructions

1. Complete the steps above according to your case: either Windows or Mac user.
2. Capture a **screenshot of the USB drive contents** (see Figure [1.2](#)) for Windows users, or a **screenshot of the Disk Utility** app for Mac users.
3. Save the screenshot in PNG or JPG/JPEG format.
4. Name the file according to the required format: [FirstnameLastname_s1_e1.png](#).
5. Submit the file through the assignment submission area on Canvas.

NOTE: Your screenshot must clearly display either the USB drive contents (Windows) or the Disk Utility app (Mac). Submissions that appear copied, unclear, or altered will be considered invalid and may result in a score of 0 for this assignment.



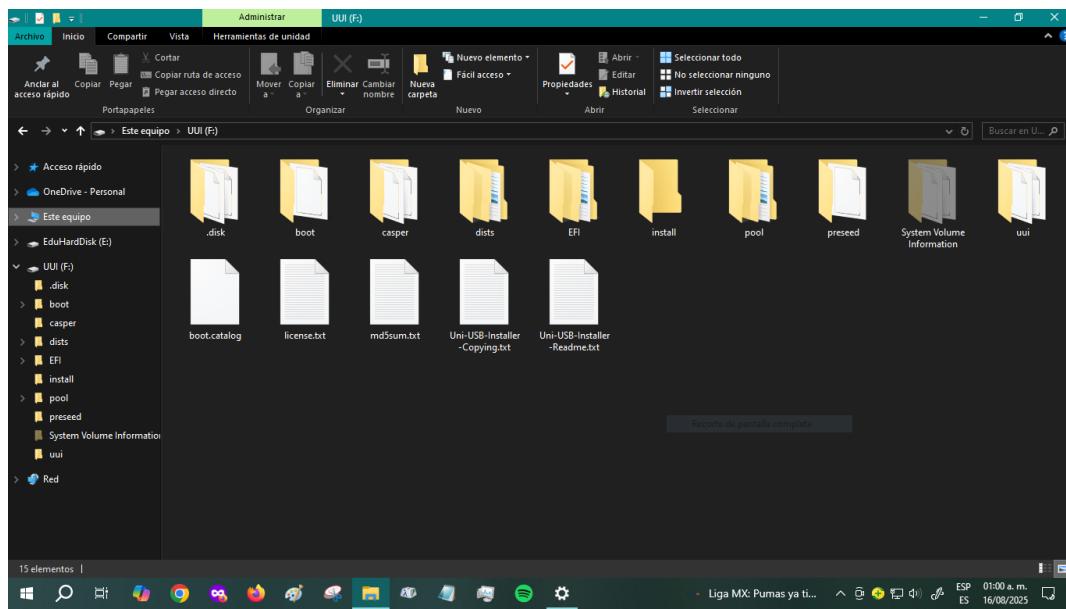


Figure 1.2: Example screenshot of bootable USB contents (Windows users).

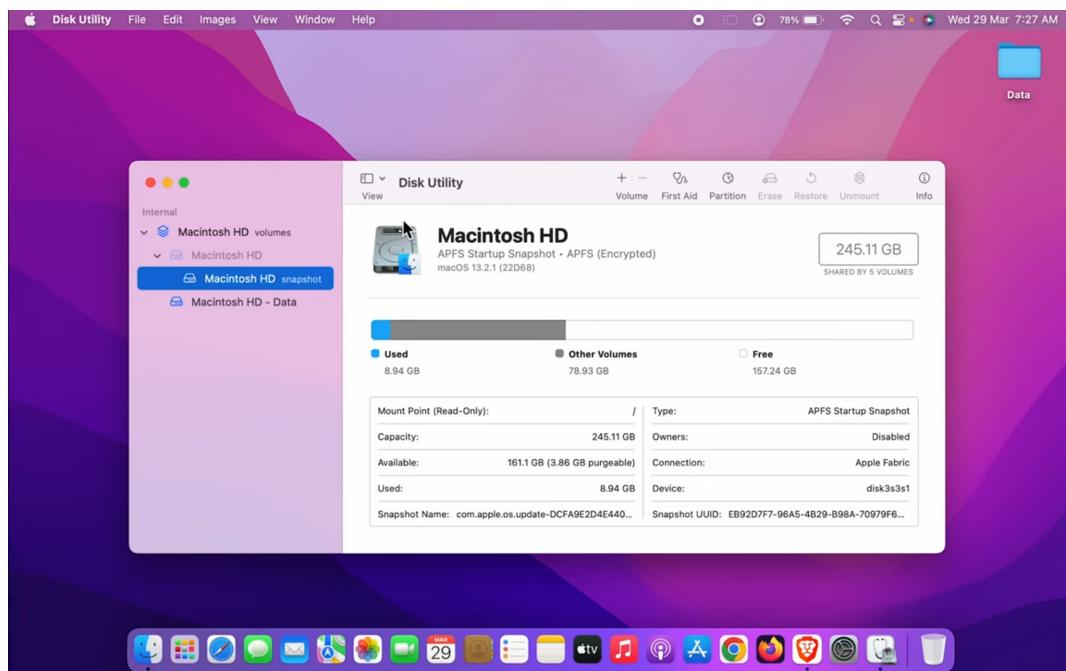


Figure 1.3: Example screenshot of Disk Utility (Mac users).

1.6 Practice Assignment 2: VS Code & Ubuntu Terminal

In this assignment, you will open a [Visual Studio Code \(VS Code\)](#) session and run specific terminal commands on Ubuntu, capturing evidence of successful execution via a screenshot. This evidence will be submitted in the designated assignment area on Canvas as an image file. The filename must follow the format:

FirstnameLastname_s1_e2.png,

where **s1** corresponds to the session number and **e2** is the evidence number. For example:

EduardoDavila_s1_e2.png.

1.6.1 VS Code Session

1. Open [VS Code](#) from the application menu by searching for `code`, or launch it from a terminal with: `code`.
2. Navigate to the *Extensions* view by clicking on the square icon (█) in the sidebar or pressing **Ctrl+Shift+X**. Ensure that the extensions listed in Section 1.3.2 are installed.
3. Position the [VS Code](#) window on either the left or right half of the screen to prepare for a side-by-side view with the terminal (see Figure 1.4).

1.6.2 Commands in Ubuntu Terminal

1. Open a terminal (**Ctrl+Alt+T**) and display your machine's hostname and username:

```
$ hostname  
$ whoami
```

2. In the same terminal, verify that [Python 3.10](#) is installed by running:

```
$ python3 --version
```

3. Move the terminal window to the opposite side of the screen from [VS Code](#), so both are visible simultaneously (see Figure 1.4).

1.6.3 Submission Instructions

1. Complete all steps as described above.
2. Capture a **screenshot showing both the VS Code and terminal windows**, ensuring that the terminal output is readable (see Figure 1.4).
3. Save the screenshot in PNG or JPG/JPEG format.
4. Name the file according to the required format: **FirstnameLastname_s0.png**.
5. Submit the file through the assignment submission area on Canvas.

NOTE: Your screenshot must clearly display both your machine's username and hostname to verify authenticity. Submissions that appear copied, unclear, or altered will be considered invalid and may result in a score of 0 for this assignment.



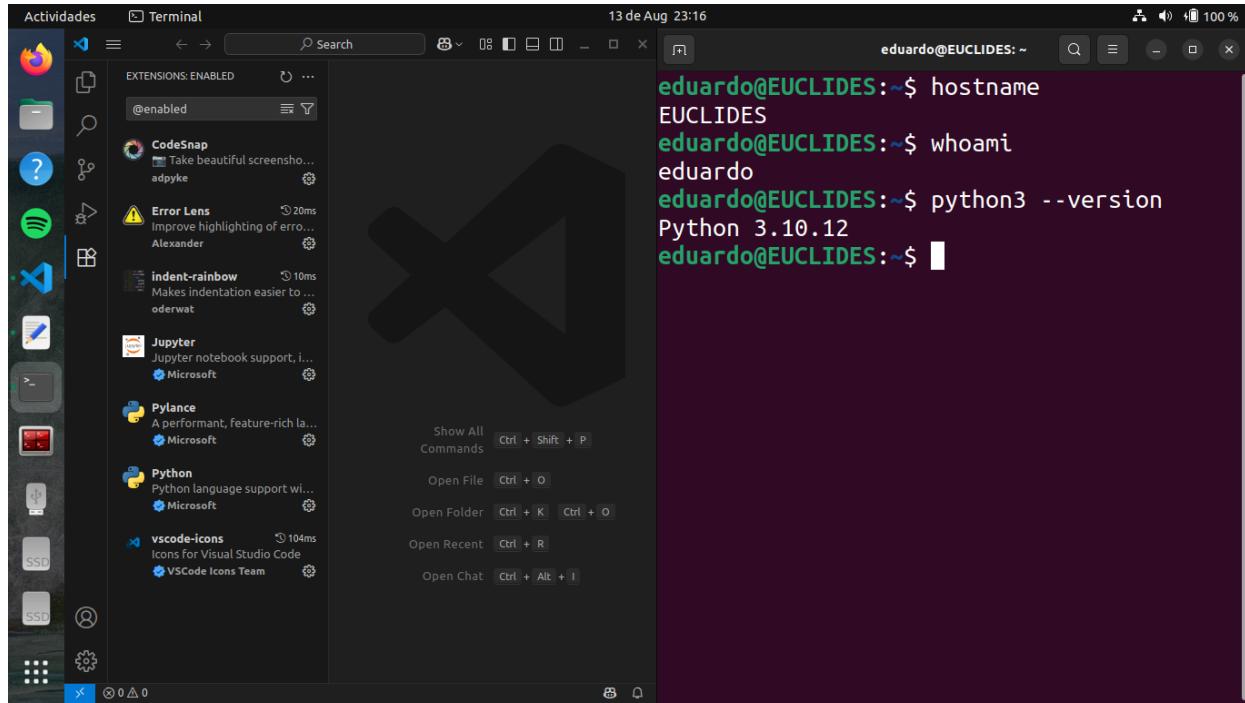


Figure 1.4: Example screenshot showing the [VS Code](#) session and the terminal output.