📓 Day 3 – Python, VS Code, Jupyter & Environment Setup

==> Why Environment Setup is Important

Before writing **AI, ML, or GenAI code**, we must first **prepare our system**.

👉 Just like:

- Before cooking → we prepare the kitchen
- Before driving → we check the vehicle

Similarly:

Before AI coding → we setup Python + tools correctly

--> Wrong setup = errors, confusion, wasted time

--> Proper setup = smooth learning & professional workflow

==> What We Are Setting Up Today

In this video, we will setup:

1. Python (Programming Language)
2. VS Code (Code Editor)
3. Jupyter Notebook (Interactive coding)
4. Package Manager (pip / conda)
5. Folder Structure for AI Projects

==> Python Installation

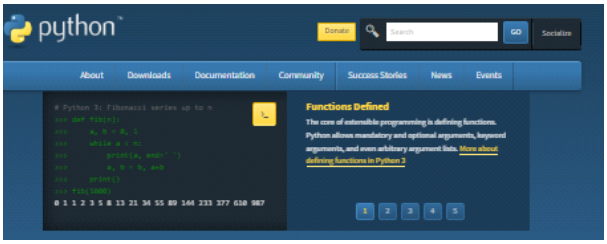
-- > What is Python?

Python is the **core language** for:

- Data Science
- Machine Learning
- Deep Learning
- Generative AI

==> Download Python

1. Open browser
2. Go to 👉 https://www.python.org
3. Click **Download Python 3.x (latest)**



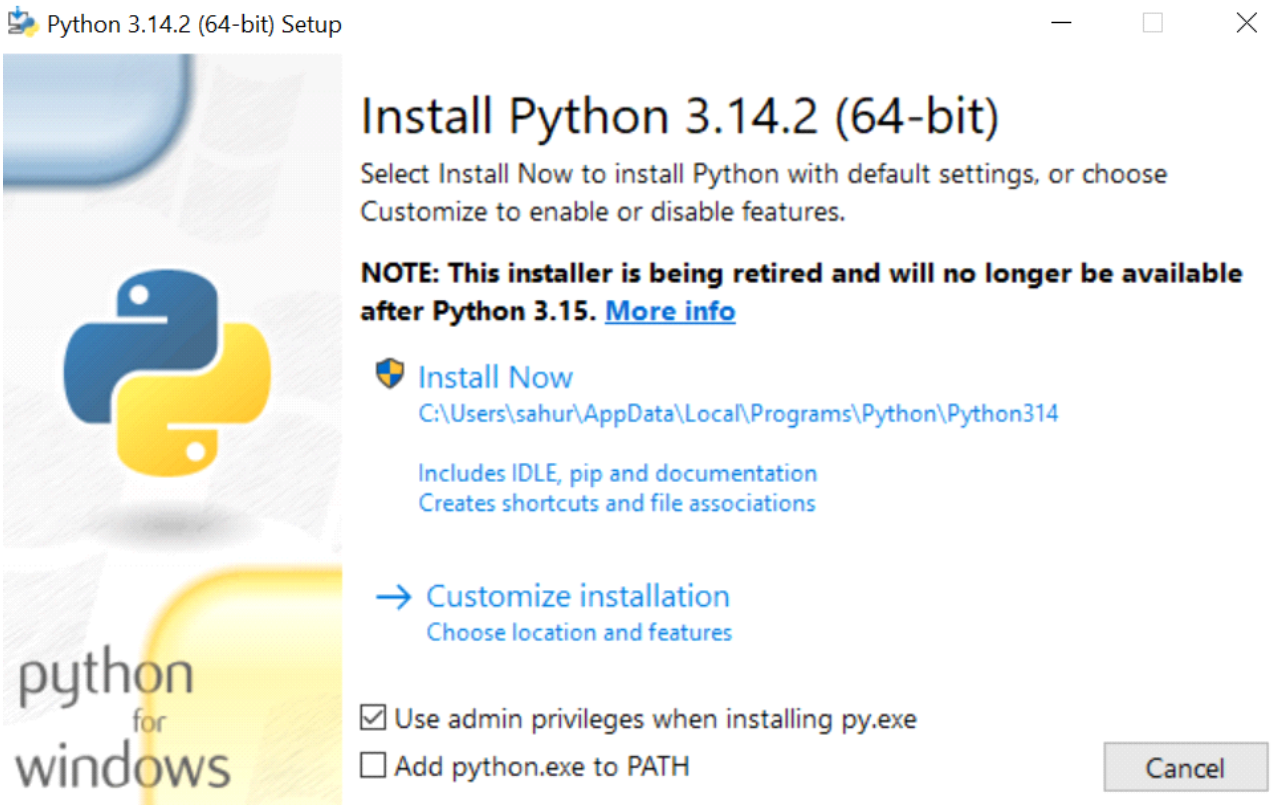
==> Important Installation Settings

During installation:

☑ Check **"Add Python to PATH"**

☑ Click **Install Now**

📌 *This is VERY IMPORTANT* — without PATH, Python won't work in terminal.



==>Verify Python Installation

Open **Command Prompt / Terminal** and type:

python --version
Output should be like:

Python 3.11.x

Command Prompt - python

```
Microsoft Windows [Version 10.0.19045.6466]
(c) Microsoft Corporation. All rights reserved.

C:\Users\sahur>python
Python 3.10.0 (tags/v3.10.0:b494f59, Oct  4 2021, 19:00:18) [MSC v.1929 64 bit (AMD64)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

==> VS Code Installation & Setup

--> What is VS Code?

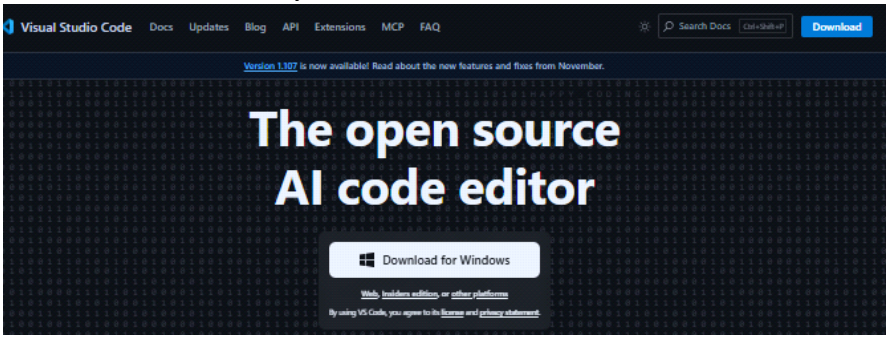
VS Code is a **lightweight, powerful code editor** used by professionals.

Used for:

- Writing Python scripts
- AI projects
- Debugging
- GitHub integration

==> Step : Install VS Code

1. Go to 👉 https://code.visualstudio.com
2. Download for your OS
3. Install normally



==>Step : Install Required Extensions

Open VS Code → Extensions tab → Install:

✅ Python (Microsoft)

✅ Jupyter

These enable:

- Code suggestions
- Running Python files
- Jupyter notebooks inside VS Code

==> Run Python in VS Code

Create file: test.py

print("VS Code setup successful")
Click **Run** ▶

==> What is Jupyter Notebook?

--> Definition

Jupyter Notebook is an **interactive environment** where:

- Code
- Output
- Notes

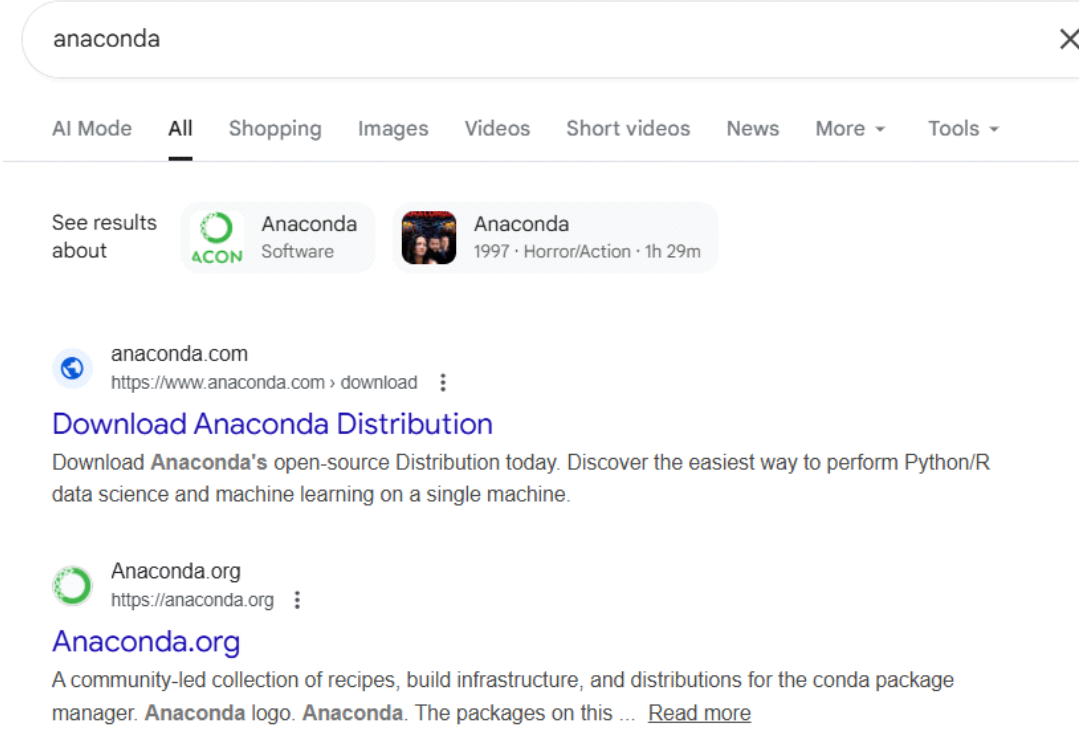
  are in one place.

--> Perfect for **Data Science & AI learning**.

==> Why AI Engineers Use Jupyter

- Step-by-step execution
- Visual outputs
- Easy experimentation
- Great for teaching & demos

==> Install Jupyter Notebook



🧪 Jupyter Example

```
x = 10
y = 20
x + y
```
Output:

30

==> Anaconda

📌 What is Anaconda?

Anaconda is a **bundle** that includes:

- Python
- Jupyter
- Data Science libraries

In this course:

- We will use **Python + pip**
- Anaconda is optional

==> Virtual Environment (venv)

📌 What is Virtual Environment?

A virtual environment isolates project libraries.
Create venv:

```
python -m venv ai_env
```
Activate:

```
ai_env\Scripts\activate   # Windows
```
👉 Prevents dependency conflicts.

==> Why These Tools Matter for AI Engineer

Tool	Why Needed
Python	Core language
pip	Install AI libraries
VS Code	Professional coding
Jupyter	Data exploration
Folder structure	Real-world workflow
Virtual env	Project isolation