

Python Installation and Setup

****Lecture 8****

Setting up your environment to write and run Python code.

Agenda

1. Downloading Python
2. Installing on Windows, macOS, and Linux
3. Understanding the PATH variable
4. Verifying the Installation
5. Introduction to Python IDEs
6. Running your first script

Downloading Python

The official source for Python is `**python.org**`.

Always download the latest stable release (e.g., Python 3.12+).

`**Python 2 vs Python 3:**`

- Python 2 reached its End of Life in 2020.
- We exclusively use Python 3.

Choose the installer matching your operating system architecture (usually 64-bit).

Installation on Windows

1. Run the downloaded '.exe' installer.
2. ****CRITICAL STEP:**** Check the box that says ****"Add Python to PATH"**** at the bottom of the first screen.
3. Click "Install Now".
4. (Optional) Disable path length limit at the end of the installation.

What is the PATH Variable?

An environment variable that tells the operating system where to look for executable files.

When you type 'python' in the command prompt, the OS searches the directories listed in PATH.

If Python's installation directory is not in PATH, you would have to type the full path (e.g., 'C:\{\}Python39\{\}python.exe') every time.

Installation on macOS and Linux

****macOS:****

- Use the macOS installer from python.org.
- Alternatively, use Homebrew: 'brew install python'

****Linux:****

- Most Linux distros come with Python pre-installed.
- To update or install: 'sudo apt update && sudo apt install python3' (Debian/Ubuntu).

Verifying the Installation

Open a Command Prompt (Windows) or Terminal (macOS/Linux).

Type:

```
python --version  
# OR  
python3 --version
```

****Expected Output:****

'Python 3.12.2'

If you see this, Python is successfully installed and added to PATH.

Integrated Development Environments (IDEs)

While you can write Python in Notepad, an IDE provides essential tools:

- Syntax highlighting.
- Autocomplete / IntelliSense.
- Debugging tools.

****IDLE:**** Python's built-in, basic IDE. Good for quick tests.

****VS Code:**** A powerful, free code editor by Microsoft. Highly recommended.

****PyCharm:**** A dedicated, feature-rich Python IDE by JetBrains.

Setting up VS Code for Python

1. Download and install VS Code.
2. Open VS Code and go to the Extensions view ('Ctrl+Shift+X').
3. Search for "Python" and install the official extension by Microsoft.
4. Create a new file, save it as 'hello.py'.
5. VS Code will automatically detect your Python interpreter.

Running Your First Script

In your 'hello.py' file, write:

```
print('Hello, World!')
```

****To run it:****

- In VS Code: Click the "Play" button in the top right.
- From Terminal: Navigate to the folder and run:

```
python hello.py
```

The Python Interactive Shell (REPL)

REPL stands for ****Read-Eval-Print Loop****.

Type 'python' in your terminal without a filename.

You get a '>>> ' prompt.

You can type Python code and get immediate results.

```
>>> 2 + 3
5
>>> print('Hi')
Hi
```

Type 'exit()' or press 'Ctrl+Z'/'Ctrl+D' to leave.

Summary

We installed Python 3 from the official website.

We ensured Python was added to our system's PATH variable.

We verified the installation using the terminal.

We set up VS Code and ran our first 'hello.py' script.