Lab 1. Python basics

Natural Language Processing and Large Language Models
Jan 15, 2026

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Outline

1 Introduction

2 Environment Management

3 Tutorials

4 Preview

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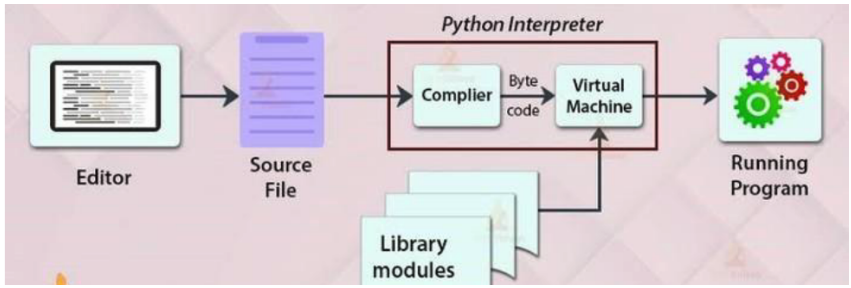
Python Basics

- Python is a widely used, general-purpose programming language that is easy to learn, read, and write.
- Used by major deep learning frameworks (e.g., *PyTorch*).
- Supported by an active open-source community and a vast ecosystem of libraries.

How Python Works

- Python is an *interpreted* language (cf. C, C++ which are compiled directly into machine code).
- Your code (.py) is first converted into bytecode (.pyc).
- The bytecode is executed by the Python Virtual Machine.
- Most implementations (e.g., *CPython*) are written in C and translate into machine code.



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Tools to Run Python

Python includes a basic interface (IDLE), but you may prefer more powerful environments:

- e.g., Visual Studio Code (VS Code)
- **Google Colab**
  - Browser-based (no installation required)
  - Built on Jupyter notebooks
  - Pre-installed libraries, optional GPU support, and Google Drive integration
- **Lab exercises**
  - Labs will be shared via **Google Colab**
  - A Google account is required to make a copy of the notebook
  - **Important:** Submit your work as a `.ipynb` file so outputs can be easily reviewed

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More tips

Detailed instructions on (1) Python and (2) VSCode installation are available HERE.

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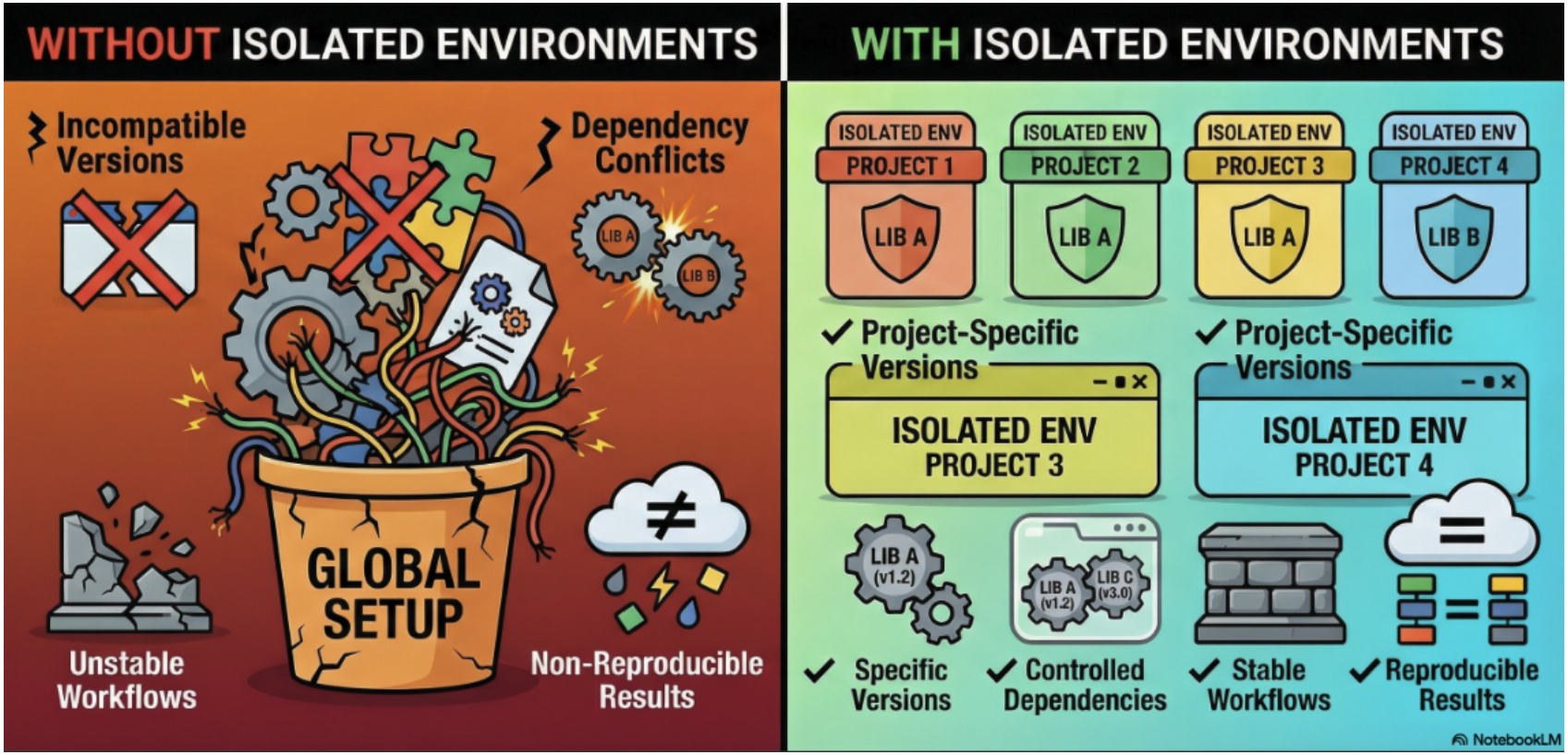
WITHOUT ISOLATED ENVIRONMENTS
Incompatible Versions
Dependency Conflicts
LIB A
LIB B
GLOBAL SETUP
Unstable Workflows
Non-Reproducible Results
WITH ISOLATED ENVIRONMENTS
ISOLATED ENV PROJECT 1
LIB A
ISOLATED ENV PROJECT 2
LIB A
ISOLATED ENV PROJECT 3
LIB A
ISOLATED ENV PROJECT 4
LIB B
✓ Project-Specific Versions
ISOLATED ENV PROJECT 3
✓ Project-Specific Versions
ISOLATED ENV PROJECT 4
LIB A (v1.2)
LIB A (v1.2)
LIB C (v3.0)
✓ Specific Versions
✓ Controlled Dependencies
✓ Stable Workflows
✓ Reproducible Results
NotebookLM

Solution 1: venv

- Built-in tool for creating virtual environments.
- Create: `python -m venv myenv`
- Activate: `source myenv/bin/activate`
- Deactivate: `deactivate`
- Includes: interpreter, libraries, scripts, isolated from global install.

Solution 2: Anaconda / Miniconda

- Manages both Python and non-Python dependencies
- Create env: `conda create -n myenv python=3.10`
- Activate: `conda activate myenv`
- Deactivate: `conda deactivate`
- Export env: `conda env export > environment.yml`

Installing Packages

- **Using conda:**
  - `conda install -n myenv package_name`
  - Specify version: `=1.2.3`
- **Using pip in conda env:**
  - `pip install package_name`
  - Tip: prefer conda, mixing pip and conda may break the environment

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Tutorials

Let's work on the Python basics.

- A Google Colab notebook with starter code is provided. Link attached to the course website.
- Follow the linked tutorial sections while completing the notebook:
  - Values, variables, functions, methods
  - Strings, lists, conditionals, loops
  - Tuples, dictionaries, classes, files

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To Do

- Follow each tutorial.
- Actively practice in Colab (NOT just reading the words).
- Complete the exercises.
- Submit your `.ipynb` file named `Lab1_YourName.ipynb` by **11:59 PM tomorrow**.
- (*not graded*)

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Assignments

Help

New Assignment | Edit Categories | More Actions

Bulk Edit

	Assignment	New Submissions	Completed	Evaluated	Feedback Published
	No Category				
	Lab 1 Due on Jan 16, 2026 11:59 PM Starts January 15		0/32	0/32	0/32

For the 9 people who have not completed this yet

Please complete the following tasks:

- Go to MyCourses and check how to access the course website.
- Check the **Assignments** tab → *1. Paper Selection*.
- Paper Selection: Find the link at the bottom, review the papers, and select your paper (first come, first served)
- Click the link below to complete the mini survey (link on the slide): `https://forms.gle/G6n2RVbPD12PewfN7`
- Check the syllabus while answering to the mini survey (which is attached to the homepage or MyCourses).
- **I'll finalize assigning paper by this Friday.**

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Next Week

- **Tuesday**: Word vectors — Presenter: Emily, TBA
- **Thursday**: Lab 2 — Word2Vec and GloVe; Presenter: Leona