Day-10 SRE Training

Topic: CI (Continuous Integration)

Continuous Integration (CI) is a DevOps practice where developers frequently merge code changes into a shared repository, followed by automated builds and tests. This helps detect and fix issues early, ensuring a stable and reliable codebase.

pyproject.toml is a configuration file used in modern Python packaging. It defines how a project should be built, its dependencies, metadata, and tools like setuptools

- [build-system] section specifies build dependencies.
- [project] section includes package name, version, dependencies, and scripts.
- **[project.scripts] defines a command-line script (basic-module) that runs main() from pattern.py.**
- [tool.setuptools] specifies the package directory.

the __init__.py files serve two main purposes:

1. **src/basic_module/__init__.py**
    - Marks basic_module as a Python package.
    - Allows importing modules from basic_module (e.g., from basic_module import datastructure).
2. **src/basic_module/datastructure/__init__.py**
    - Marks datastructure as a subpackage.
    - Allows importing modules from datastructure (e.g., from basic_module.datastructure import pattern).

Without __init__.py, Python wouldn't recognize basic_module or datastructure as packages, leading to import errors.

A **Wheel (.whl) package** is a binary distribution format for Python packages. It speeds up installation because it doesn't require building from source.

Why is a Wheel Package Necessary?

1. **Faster Installation** – No need to compile source code; just extract and use.
2. **Cross-Platform Compatibility** – Works on different systems without modification.
3. **Reduces Dependencies** – Avoids issues with missing compilers or dependencies.
4. **Standardized Packaging** – Ensures consistent installation with pip install.

```
python3 -m build --wheel
```

This command creates a .whl file inside the dist/ directory, ready for distribution.

After Building a Wheel File (.whl), You Can:

Install the Wheel Locally:

```
pip install dist/basic_module-0.1.0-py3-none-any.whl --force-reinstall
```

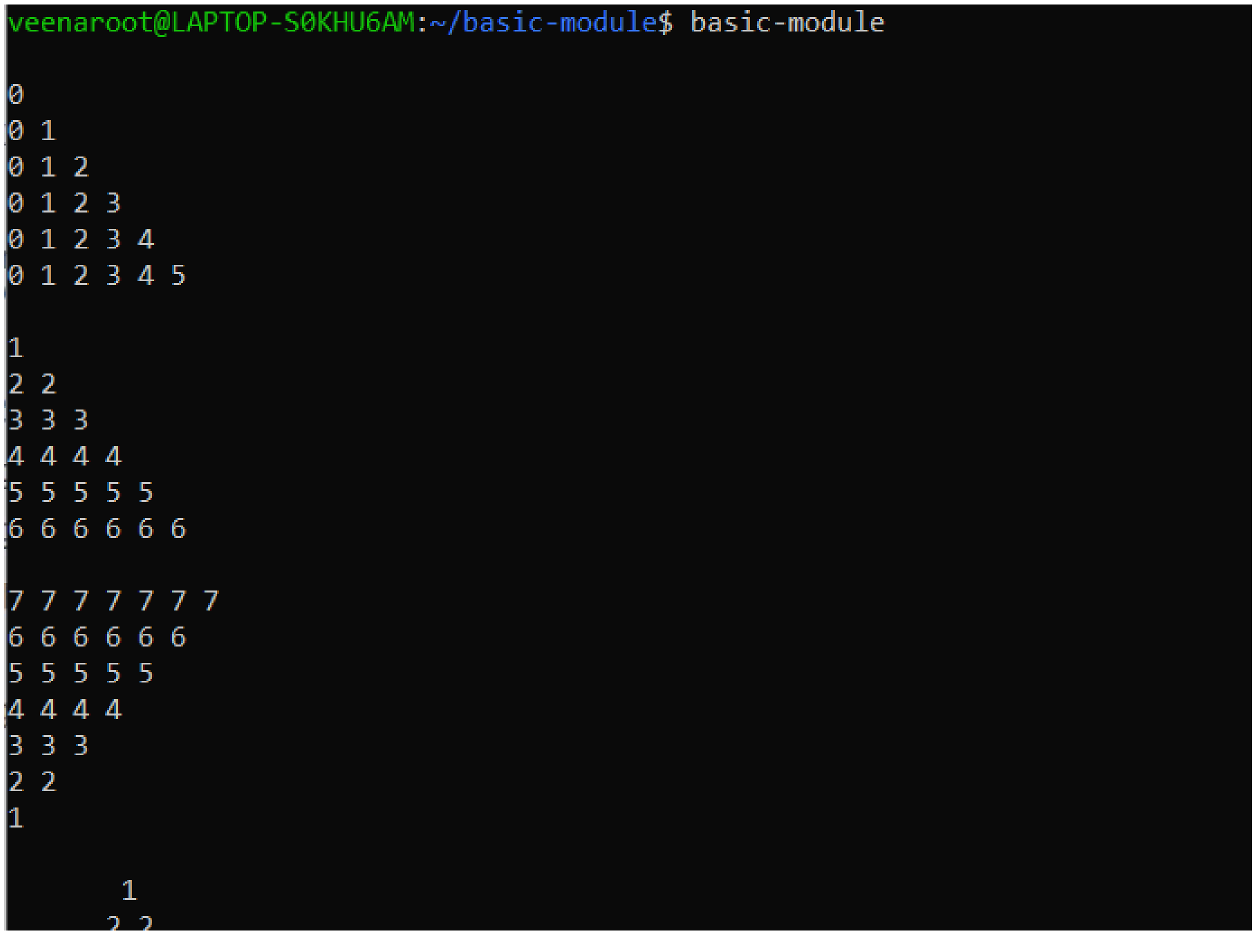
- Installs your package from the built wheel file.

Distribute the Wheel File:

- Share the .whl file with others so they can install it using pip install your_package.whl.
- No need to share source code.

Once you install the package, you can run the basic-module command in the terminal

- This executes the main() function from pattern.py, as defined in pyproject.toml
- When you type basic-module, Python looks for the installed script.
- It runs main() inside src/basic_module/datastructure/pattern.py.
- The script outputs whatever logic is defined in main().



```
veenaroot@LAPTOP-S0KHU6AM:~/basic-module$ basic-module

0
0 1
0 1 2
0 1 2 3
0 1 2 3 4
0 1 2 3 4 5

1
2 2
3 3 3
4 4 4 4
5 5 5 5 5
6 6 6 6 6 6

7 7 7 7 7 7 7
6 6 6 6 6 6
5 5 5 5 5
4 4 4 4
3 3 3
2 2
1

       1
      2 2
```

```
pip install -e .
```

It installs your package in **editable mode** (also called **development mode**).

The `-e` (editable) flag creates a **symbolic link** between your source code and the installed package.

The `.` tells `pip` to install the package from the **current directory**.

No Need to Rebuild (`.whl`) After Code Changes

- When you modify your code (e.g., `pattern.py`), changes take effect immediately.
- No need to rerun `python3 -m build --wheel` or reinstall the package.