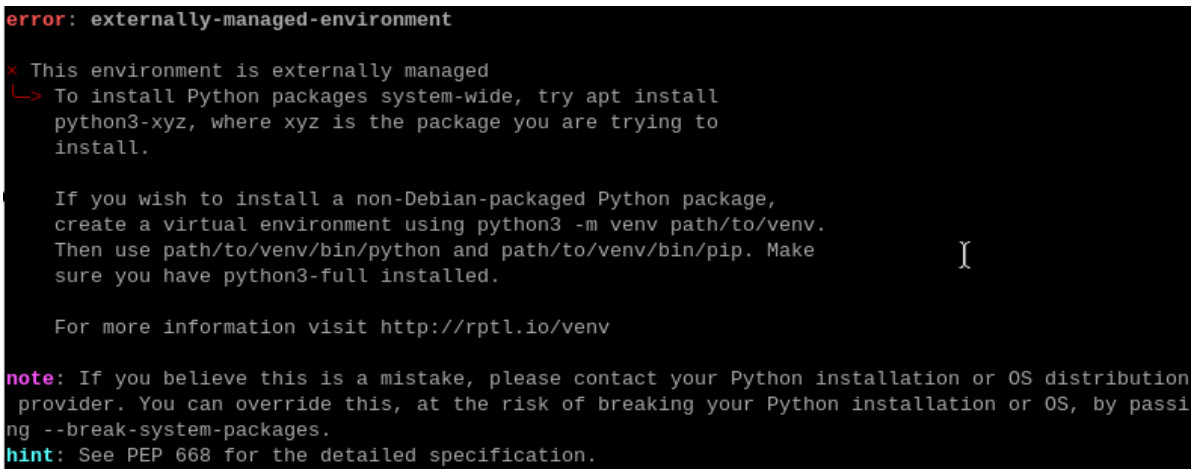
Python virtual environment

In previous versions of the operating system, the program could be installed using Python's pip tool:

```
$ pip install buildhat
```

But in newer versions of Raspberry Pi OS systems, this is not allowed; if you try to install a Python package system-wide, you will receive an error similar to the following:




```
We used another method to eliminate this warning when building the jupyter lab environment, but here we only introduce how to build a python virtual environment.
```

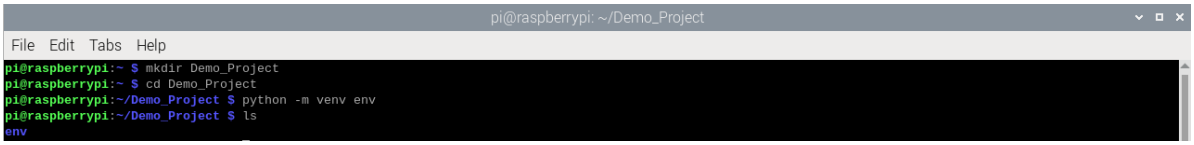
Python virtual environment

To use a virtual environment, you need to create a container to store the environment.

Create a virtual environment

Create and enter the Demo_Project folder, then use Python's built-in module venv to create a virtual environment named env:

```
mkdir Demo_Project
cd Demo_Project
python -m venv env
```



After the operation is successful, there will be an additional env folder under the folder.

Activate virtual environment

In this directory is a complete Python distribution; activate the virtual environment and make this Python version the currently used version:

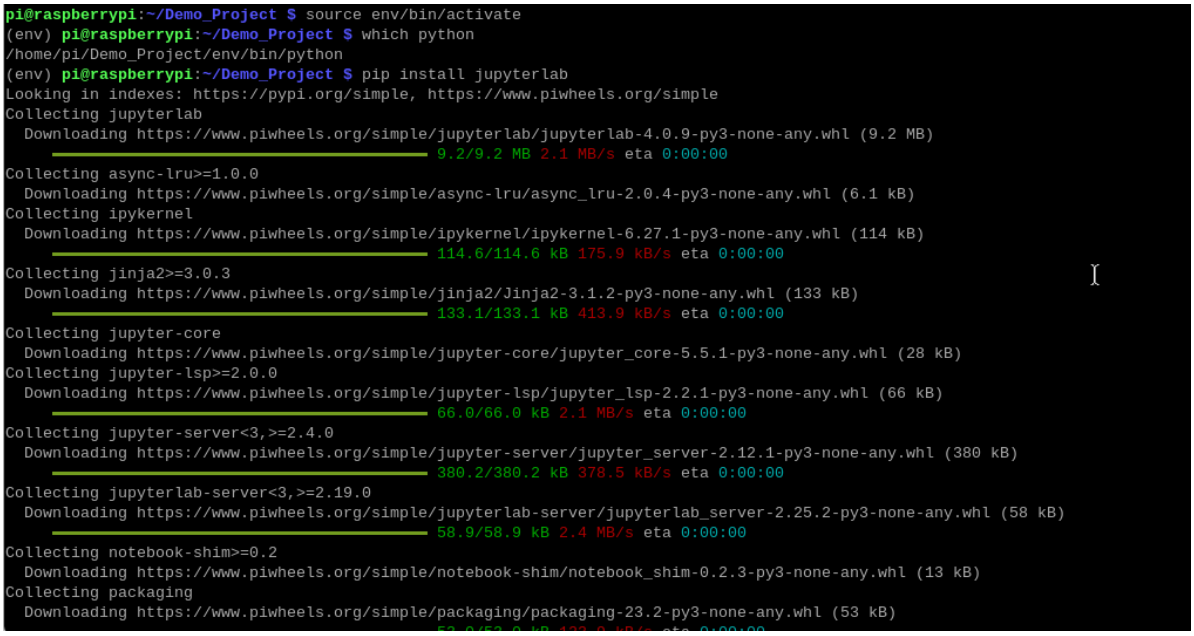
```
source env/bin/activate
```

At this point, we are no longer using the system Python, but the version of Python included in the virtual environment:

- Any changes made here will not cause problems for your system Python;
- Any new modules installed into the environment will also not affect system Python.

Install the third line package

```
pip install jupyterlab
```



View the modules installed by the current Python version:

```
pip list
```

```
(env) pi@raspberrypi:~/Demo_Project $ pip list
Package                    Version
-------------------------- ---------
anyio                      4.2.0
argon2-cffi                23.1.0
argon2-cffi-bindings       21.2.0
arrow                      1.3.0
asttokens                  2.4.1
async-lru                  2.0.4
jupyter_client             8.6.0
jupyter_core               5.5.1
jupyter-events             0.9.0
jupyter-lsp                2.2.1
jupyter_server             2.12.1
jupyter_server_terminals   0.5.0
jupyterlab                 4.0.9
jupyterlab_pygments        0.3.0
jupyterlab_server          2.25.2
```

Exit the virtual environment

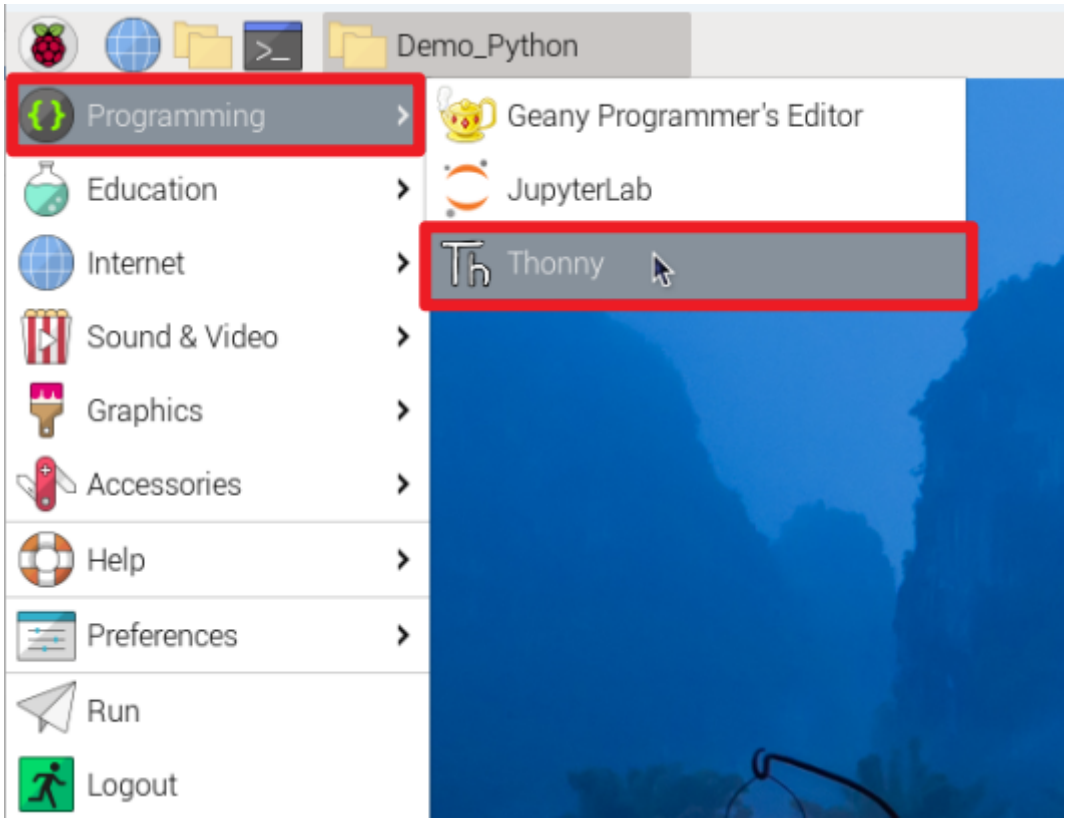
```
deactivate
```

```
(env) pi@raspberrypi:~/Demo_Project $ deactivate
pi@raspberrypi:~/Demo_Project $
```

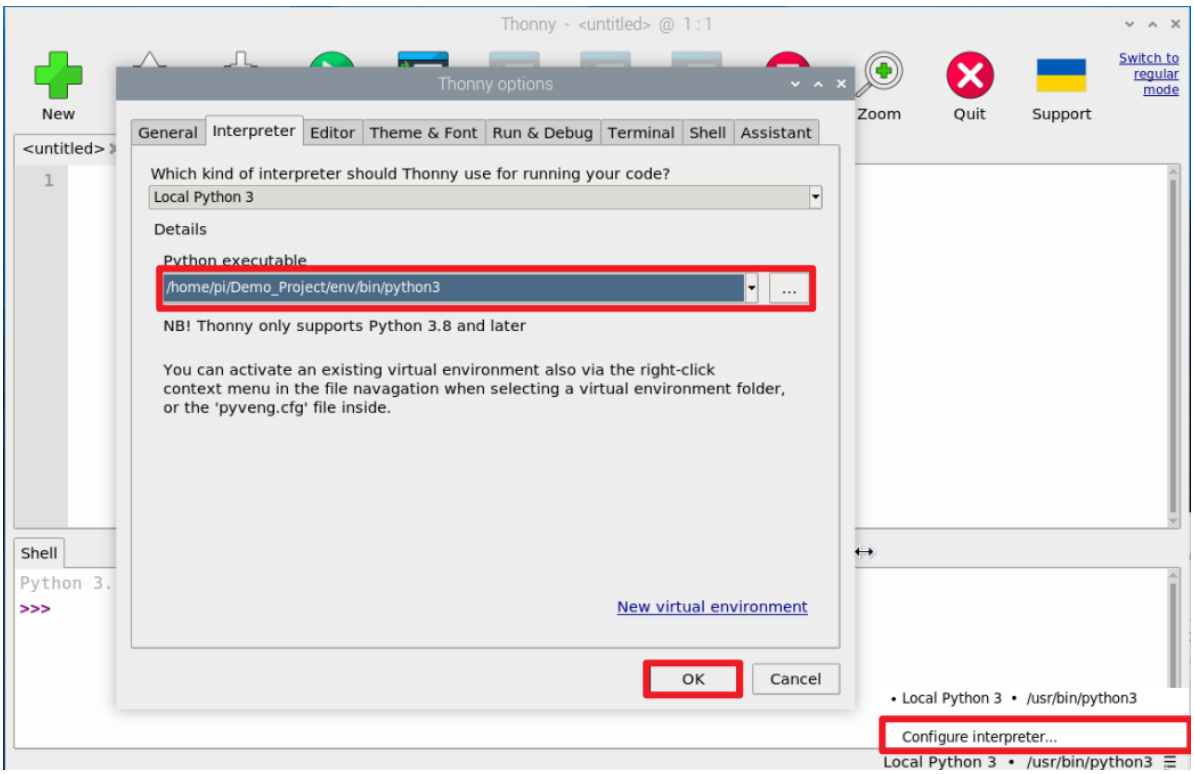
Thonny Editor

When using Python on the Raspberry Pi, Thonny is the system default editor and the interpreter uses the system Python.

Change the virtual environment Python version



Click the interpreter menu in the lower right corner of the Thonny interface to switch to the Python virtual environment: Add according to the virtual environment path



Configuration successful: