Setting Up Python, Jupyter, and VSCode

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This guide will walk you through installing Python using `pyenv` (Mac) or `pyenv-win` (Windows), setting up Jupyter and JupyterLab, and installing Visual Studio Code (VSCode) on your computer.

1. Installing `pyenv` (Mac) or `pyenv-win` (Windows)

Purpose of pyenv (from ChatGPT)

Python is an evolving language, and different projects may require different versions of Python. Some older projects may rely on an earlier Python version (e.g., Python 3.7), while new projects might require the latest version. `pyenv` (and `pyenv-win`) solves this problem by letting users install and switch between multiple Python versions effortlessly. Instead of overwriting the system's default Python installation, pyenv creates isolated environments where different Python versions can be used independently.

macOS: Installing `pyenv`

`pyenv` is a tool to manage multiple Python versions on your system.

1. Open the Terminal application.

2. Install `Homebrew` if you don't have it already:

   ```
   /bin/bash -c "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/HEAD/install.sh)"
   ```

3. Install `pyenv` using Homebrew:

   ```
   brew install pyenv
   ```

4. Add `pyenv` to your shell startup file. For most macOS users, your terminal uses Zsh. If that is the case, the following commands will work, but you may need to have different commands for your machine. See https://github.com/pyenv/pyenv?tab=readme-ov-file#set-up-your-shell-environment-for-pyenv for more information.

   ```
   echo 'export PYENV_ROOT="$HOME/.pyenv"' >> ~/.zshrc
   echo '[[ -d $PYENV_ROOT/bin ]] && export PATH="$PYENV_ROOT/bin:$PATH"' >> ~/.zshrc
   echo 'eval "$(pyenv init -)"' >> ~/.zshrc
   ```

5. Exit the terminal and open a new terminal window.

6. Get the list of versions of Python available

```
pyenv install -l
```

7. Install Python with pyenv:

```
pyenv install 3.12.6  # Latest stable Python version as of Oct 1 2024
pyenv global 3.12.6   # Set the default Python version.
```

Windows: Installing `pyenv-win`

`pyenv-win` allows Windows users to easily manage multiple Python versions. https://pyenv-win.github.io/pyenv-win/

1. Open PowerShell as Administrator.

2. Install `pyenv-win` in PowerShell

```
Invoke-WebRequest  -UseBasicParsing  -Uri  "https://raw.githubusercontent.
com/pyenv-win/pyenv-win/master/pyenv-win/install-pyenv-win.ps1" -OutFile "./
install-pyenv-win.ps1"; &"./install-pyenv-win.ps1"
```

3. Exit PowerShell and open a new PowerShell window.

4. Get the latest list of versions of Python available

```
pyenv install -l
```

5. Install Python using pyenv:

```
pyenv install 3.12.6  # Latest stable Python version as of Oct 1 2024
pyenv global 3.12.6   # Set the default Python version.
```

2. Installing Jupyter and JupyterLab

Once `pyenv` is set up and Python is installed, you can install Jupyter using `pip`.

1. Open a terminal (macOS) or PowerShell (Windows).

2. Upgrade `pip` (the Python package manager):

```
pip install --upgrade pip
```

3. Install Jupyter and JupyterLab:

```
pip install jupyterlab notebook
```

4. To launch JupyterLab, run:

```
jupyter lab
```

When you run this command, a web browser window may automatically open. If a browser window does not open, look for a URL in the output of the console. It will look something like: `http://localhost:8888/lab?token=a123d4e567efccdbba8b901e2e34` Copy and paste that URL into a web browser.

3. Installing Visual Studio Code (VSCode)

VSCode is a powerful code editor that integrates well with Python and Jupyter. Please note that despite the confusing name, Visual Studio Code is not the same thing as Visual Studio.

Installation
1. Download VSCode for your machine: https://code.visualstudio.com.
2. Install:
   - MacOS: Open the downloaded `.zip` file and drag the VSCode application to your `Applications` folder.
   - Windows: Run the downloaded `.exe` file and follow the installation instructions.
3. Launch VSCode and install the Python extension:
   - Open VSCode and click on the Extensions icon on the left sidebar.
   - Search for "Python" and install the extension by Microsoft.
4. Install the Jupyter extension:
   - In the Extensions sidebar, search for "Jupyter" and install the extension by Microsoft.