5. Using Python on a Mac

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Python on a Mac running macOS is in principle very similar to Python on any other Unix platform, but there are a number of additional features such as the IDE and the Package Manager that are worth pointing out.

5.1. Getting and Installing MacPython

macOS used to come with Python 2.7 pre-installed between versions 10.8 and 12.3. You are invited to install the most recent version of Python 3 from the Python website (https://www.python.org). A current “universal binary” build of Python, which runs natively on the Mac’s new Intel and legacy PPC CPU’s, is available there.

What you get after installing is a number of things:

- A `Python 3.12` folder in your `Applications` folder. In here you find IDLE, the development environment that is a standard part of official Python distributions; and PythonLauncher, which handles double-clicking Python scripts from the Finder.
- A framework `/Library/Frameworks/Python.framework`, which includes the Python executable and libraries. The installer adds this location to your shell path. To uninstall MacPython, you can simply remove these three things. A symlink to the Python executable is placed in /usr/local/bin/.

The Apple-provided build of Python is installed in `/System/Library/Frameworks/Python.framework` and `/usr/bin/python`, respectively. You should never modify or delete these, as they are Apple-controlled and are used by Apple- or third-party software. Remember that if you choose to install a newer Python version from python.org, you will have two different but functional Python installations on your computer, so it will be important that your paths and usages are consistent with what you want to do.

IDLE includes a help menu that allows you to access Python documentation. If you are completely new to Python you should start reading the tutorial introduction in that document.

If you are familiar with Python on other Unix platforms you should read the section on running Python scripts from the Unix shell.

5.1.1. How to run a Python script

Your best way to get started with Python on macOS is through the IDLE integrated development environment, see section The IDE and use the Help menu when the IDE is running.

If you want to run Python scripts from the Terminal window command line or from the Finder you first need an editor to create your script. macOS comes with a number of standard Unix command line editors, **vim** and **emacs** among them. If you want a more Mac-like editor, **BBEdit** or **TextWrangler** from Bare Bones Software (see http://www.barebones.com/products/bbedit/index.html) are good choices, as is **TextMate** (see

https://macromates.com/). Other editors include **Gvim** (https://macvim-dev.github.io/macvim/) and **Aquamacs** (http://aquamacs.org/).

To run your script from the Terminal window you must make sure that `/usr/local/bin` is in your shell search path.

To run your script from the Finder you have two options:

- Drag it to **PythonLauncher**
- Select **PythonLauncher** as the default application to open your script (or any .py script) through the finder Info window and double-click it. **PythonLauncher** has various preferences to control how your script is launched. Option-dragging allows you to change these for one invocation, or use its Preferences menu to change things globally.

5.1.2. Running scripts with a GUI

With older versions of Python, there is one macOS quirk that you need to be aware of: programs that talk to the Aqua window manager (in other words, anything that has a GUI) need to be run in a special way. Use **pythonw** instead of **python** to start such scripts.

With Python 3.9, you can use either **python** or **pythonw**.

5.1.3. Configuration

Python on macOS honors all standard Unix environment variables such as `PYTHONPATH`, but setting these variables for programs started from the Finder is non-standard as the Finder does not read your `.profile` or `.cshrc` at startup. You need to create a file `~/.MacOSX/environment.plist`. See Apple's Technical Document QA1067 for details.

For more information on installation Python packages in MacPython, see section Installing Additional Python Packages.

5.2. The IDE

MacPython ships with the standard IDLE development environment. A good introduction to using IDLE can be found at http://www.hashcollision.org/hkn/python/idle_intro/index.html.

5.3. Installing Additional Python Packages

There are several methods to install additional Python packages:

- Packages can be installed via the standard Python distutils mode (`python setup.py install`).
- Many packages can also be installed via the **setuptools** extension or **pip** wrapper, see https://pip.pypa.io/.

5.4. GUI Programming on the Mac

There are several options for building GUI applications on the Mac with Python.

PyObjC is a Python binding to Apple's Objective-C/Cocoa framework, which is the foundation of most modern Mac development. Information on PyObjC is available from https://pypi.org/project/pyobjc/.

The standard Python GUI toolkit is `tkinter`, based on the cross-platform Tk toolkit (https://www.tcl.tk). An Aqua-native version of Tk is bundled with OS X by Apple, and the latest version can be downloaded and installed from https://www.activestate.com; it can also be built from source.

wxPython is another popular cross-platform GUI toolkit that runs natively on macOS. Packages and documentation are available from https://www.wxpython.org.

PyQt is another popular cross-platform GUI toolkit that runs natively on macOS. More information can be found at https://riverbankcomputing.com/software/pyqt/intro.

5.5. Distributing Python Applications on the Mac

The standard tool for deploying standalone Python applications on the Mac is **py2app**. More information on installing and using py2app can be found at https://pypi.org/project/py2app/.

5.6. Other Resources

The MacPython mailing list is an excellent support resource for Python users and developers on the Mac:

https://www.python.org/community/sigs/current/pythonmac-sig/

Another useful resource is the MacPython wiki:

https://wiki.python.org/moin/MacPython