Chapter 2
Setting Up the Python Environment

2.1 Introduction

In this chapter we will check to see if you have Python installed on your computer. If you do not have Python installed we will step through the process of installing Python. This is necessary because when you run a Python program it looks for the `python` interpreter that is used to execute your program or script. Without the `python` interpreter installed on your machine Python programs are just text files!

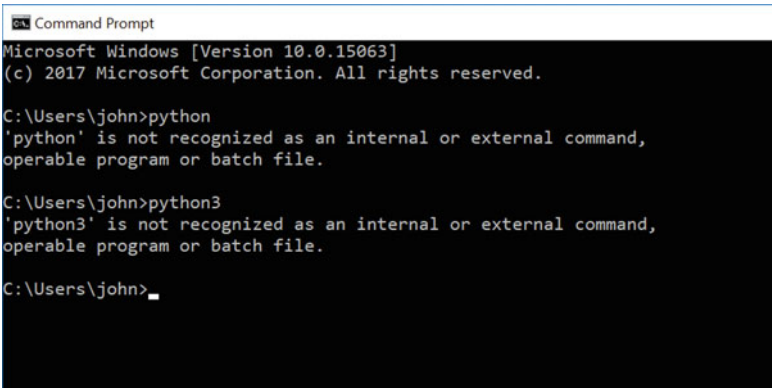
2.2 Check to See If Python Is Installed

The first thing you should do is to see if Python 3 is already installed on your computer. First check to see that you don't have Python installed. If it is you don't need to do anything unless it is a very old version of Python 3 such as 3.1 or 3.2.

On a Windows machine you can check the version installed by opening a Command Prompt window (this can be done by searching for Cmd in the 'Type here to search' box in Windows 10).

Once the Command window is open try typing in `python`. This is illustrated below:

J. Hunt, *A Beginners Guide to Python 3 Programming*,
Undergraduate Topics in Computer Science,
https://doi.org/10.1007/978-3-030-20290-3_2



Note the above has tried both python and python3 in case the latest version has been installed using that name.

On a system such as a Mac you can use the Terminal and do the same thing. You will probably find that at least python (2) is pre-installed for you. For example, if you type in `python` on a Mac you will get something like this:

This indicates that the above user has version 2.7.15 installed (note you may have another 2.x version installed).

However, be careful if you find that you have Python 2 installed on your machine; this book is focussed solely on Python 3.

If you have started a Python interpreter then

- Use `quit()` or `exit()` to exit the Python interpreter; `exit()` is an alias for `quit()` and is provided to make Python easier to use.

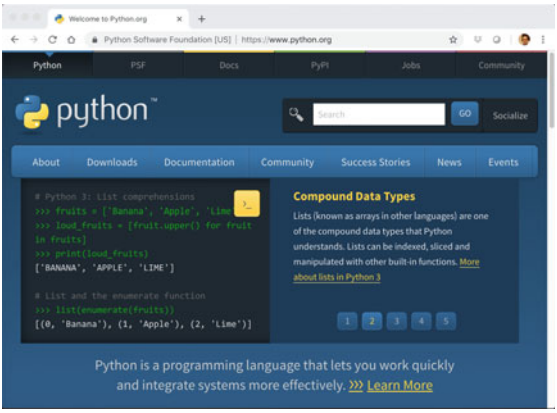
If Python 3 was not available, then the following steps will help you to install it.

If the correct version of Python is already available on your computer then you can skip to the next chapter.

2.3 Installing Python on a Windows PC

Step 1: Downloading Python
Python is available for a wide range of platforms from Windows, to Mac OS and Linux; you will need to ensure that you download the version for your operating system.

Python can be downloaded from the main Python web site which can be found at http://www.python.org



As you will see the 'Downloads' link is the second from the left on the large menu bar below the search field. Click on this and you will be taken to the download page; the current Python 3 version at the time of writing is Python 3.7 which is the version we will download. Click on the Download Python link. For example, for a Windows machine you will see:

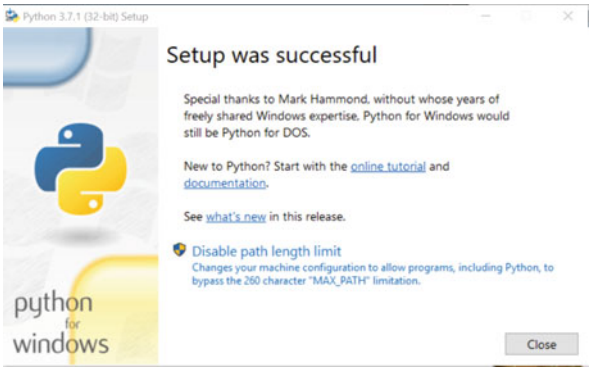
This will download an installer for your operating system. Even if a newer version of Python is available (which is likely as the version is updated quiet frequently) the steps should be fundamentally the same.

Step 2: Running the Installer
You will now be prompted for the location to install Python, for example:

Note that it is easiest if you click on the 'Add Python 3.7 to PATH' option as this will make it available from the command line. If you don't do this then don't worry, we can add Python to the `PATH` later on (the `PATH` environment variable is used by Windows to find the location of programs such as the Python interpreter).

Next select the 'Install Now' option and follow the installation steps.

If everything went as expected you should now see an confirmatory dialog such as:

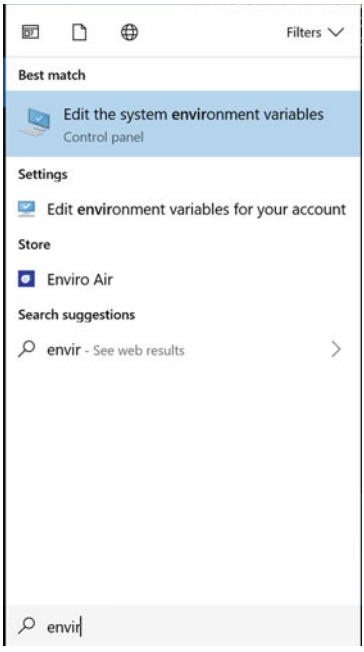


If you are on Windows now close any command windows that you have open (the `PATH` variable is not updated for existing Command Windows). This can be done by typing in 'exit' or closing the window.

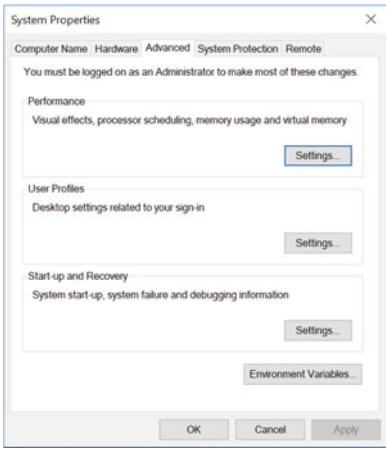
Step 3: Set Up the PATH (optional)
If you did not select 'Add Python 3.7 to PATH' at the start of the installation you will now need to set up the `PATH` environment variable. If you did then skip onto the next step.

You can set the `PATH` environment variable using the system environment variables editor.

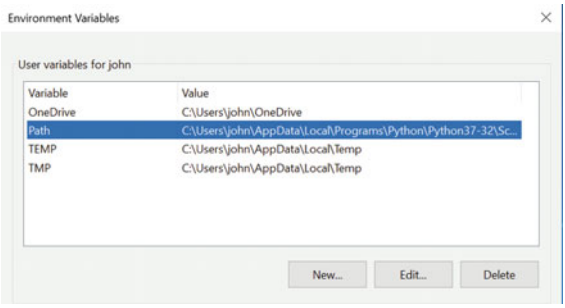
The easiest way to find this is to type '`envir`' into the Windows search box, it will then list all applications which match this pattern including the 'Edit the system environment variables' editor. If you are logged into your machine as a user with 'admin' rights use the first one listed, if you are logged in as a user without admin rights select the 'Edit environment variables for your account;' option.



One the resulting dialog select the 'Environment Variables …' button at the bottom of the page:



One the next dialog select the `PATH` environment variable and select Edit:

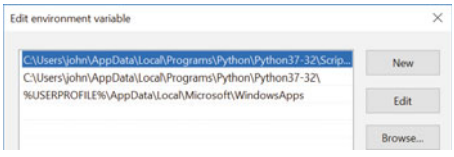


Now add the locations in which you installed Python, by default this will be something like

```
C:\Users\<username>\AppData\Local\Programs\Python\Python37-32
C:\Users\<username>\AppData\Local\Programs\Python\Python37-32\Scripts
```

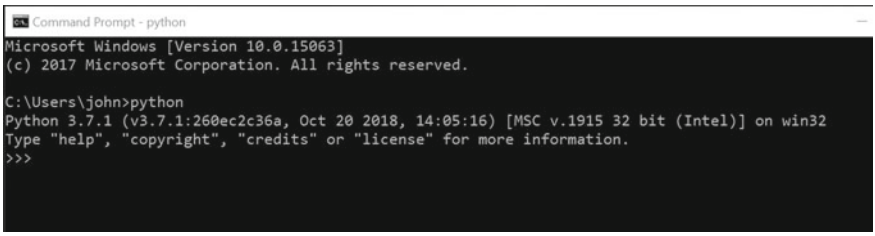
Note Python37-32 should be replaced by the version of Python you are installing if it is different.

The end result should look something like:



Now click on OK until all the windows are closed.

Step 4: Verify the Installation
Next open a new Command Prompt window and type in `python` as shown below:



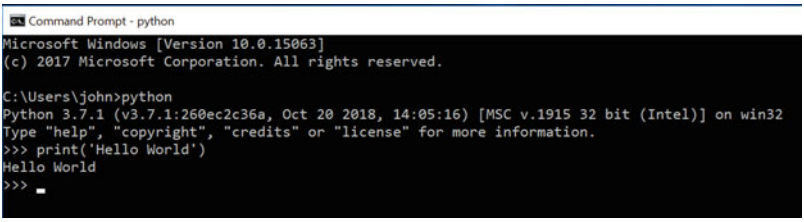
Congratulations you have installed Python and run the `python` interpreter!

Step 5: Run Some Python
Now at the '>>>' prompt type in

```
print('Hello World')
```

Be careful to make sure you use all lowercase letters for the 'print' function; Python is very case sensitive which means that as far as Python is concerned `print('Hello World')` and `Print('Hello World')` are completely different things.

Also make sure that you have single quotes around the *Hello World* text this makes it a string. If you get this right then on Windows you should see:



You have now run your first Python program. In this case your program printed out the message `'Hello World'` (a traditional first program in most programming languages).

Step 6: Exit the Python Interpreter
To exit the Python interpreter use `exit()` or Ctrl-Z plus Return.

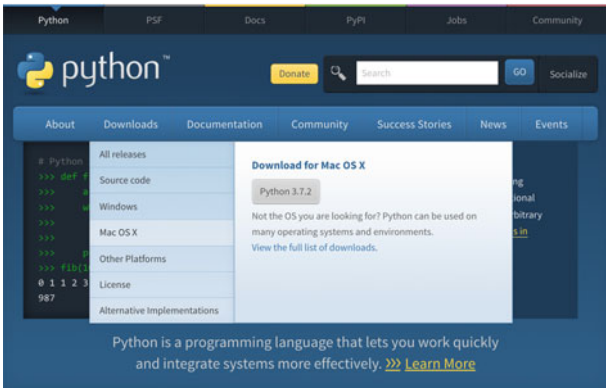
```
Command Prompt

C:\Users\john>python
Python 3.7.1 (v3.7.1:260ec2c36a, Oct 20 2018, 14:05:16) [MSC v.1915 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> print('Hello World')
Hello World
>>> exit()

C:\Users\john>
```

2.4 Setting Up on a Mac

Installing Python on a Mac is similar to installing it on a Windows machine in that you can download the Python installer for the Apple Mac from the Python Software Foundation web site (https://www.python.org). Of course this time you need to make sure you select the Mac OS version of the download as shown below:



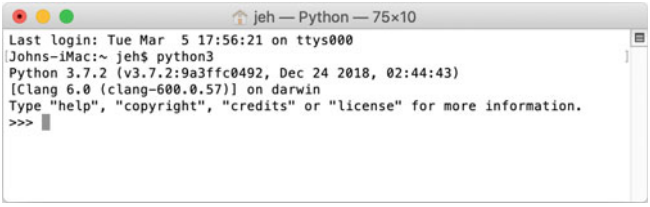
From here you can select the macOS 64-bit installer (make sure you select the appropriate one for your version of the operating system). This will download an Apple package that can be installed (it will have a name similar to `python-3.7.2-macosx10.9.pkg` although the version number of Python and the Mac OS operating system may be different). You will need to run this installer.

When you run this installer the Python Installer wizard dialog will open as shown below:

Step through the dialogs presented to you by the installer wizard accepting each option until the installation starts. Once the installation has completed you will be presented with a summary screen confirming the installation was successful. You can now close the installer.

This will have created a new folder in your Applications folder for Python 3.7.

Note that on a Mac which already has Python 2 installed (which is installed by default), Python 3 can be installed along side it and can be accessible via the `python3` command (as shown below). You should confirm that Python has been installed successfully by opening a Terminal window and entering the Python 3 REPL:

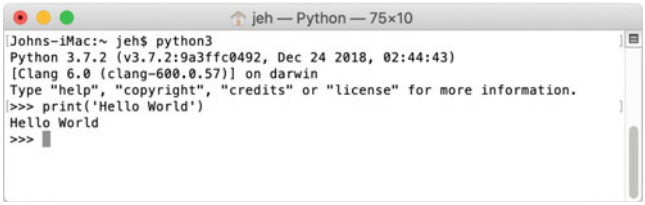


Now at the '>>>' prompt type in

```
print('Hello World')
```

Be careful to make sure you use all lowercase letters for the 'print' function; as Python is very case sensitive which means that as far as Python is concerned `print('Hello World')` and `Print('Hello World')` are completely different things.

The result should be as shown below:



You can now exit the REPL using the `exit()` or `quit()`.

2.5 Online Resources

See the Python Standard Library documentation for:

- https://docs.python.org/3/using/index.html with documentation for Python setup and usage.
- https://docs.python.org/3/faq/windows.html Python on Windows FAQ.
- https://www.jetbrains.com/pycharm/ The PyCharm IDE home page.