Chapter 3:
Machine Learning Environment Setup

To be able to learn and practice machine learning, you will first need to get your Python/Anaconda, Scikit-Learn, and TensorFlow environment set up. The following chapter will take you through how to set up your environment. With your environment set up correctly, you will be able to follow the examples in this book.

Setting Up Python and Anaconda

Scikit-learn and TensorFlow can be used with Python 2.7 and above. They will also work with Anaconda 2.7 and higher. There are a few libraries that need to be installed after you have installed Python and Anaconda which are a requirement for installing Scikit-Learn or TensorFlow. These will be covered in the corresponding sections of this chapter.

Note:

- This book assumes that you are using the **Windows** 7 or higher operating system to download and install Python, Anaconda, Scikit-Learn, and TensorFlow. While MAC and Linux download and installation procedures differ, the exercises can still be used on these operating systems.
- If you already have Python on your system, you can skip the "**Installing Python**" section and go to the "**Installing Anaconda**" section if you wish to use Anaconda.
- If you have Python already installed on your machine, you may want to check if you have the following libraries installed:
    - NumPy v 1.18.4
    - SciPy v 1.4.1
    - Pip
- If you have the above libraries installed, or the version pertaining to the release of Python installed on your machine, skip to the "**Installing Anaconda**" section.
- If you are not installing Anaconda or already have it installed on your system, you can skip to "**Installing Scikit-Learn**" or "**Installing TensorFlow**" section should you already have one or the other installed.
- If you already have your Python, Scikit-Learn, and TensorFlow environment set, you can skip this chapter altogether and proceed to the next chapter "**Using Scikit-Learn**." However, it will do you no harm checking or even upgrading your current system environment for Scikit-Learn and TensorFlow.

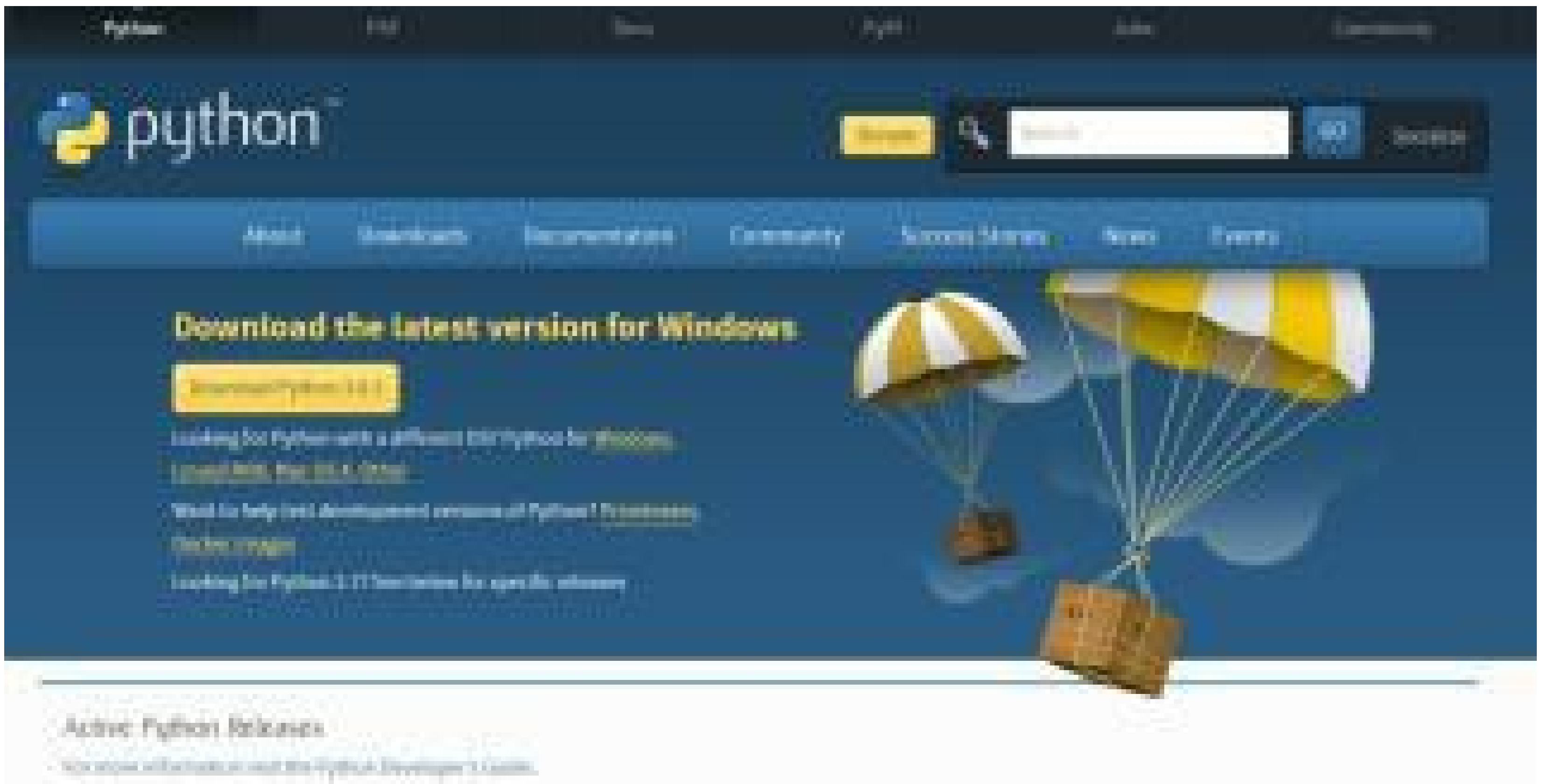
Installing Python

The latest version of Python is 3.8.3 and it can be retrieved from the Python.org website. For the sake of this book, version 3.8.3 will be used to keep the book up to date as at time of print. As it is open source software, it is free to download and use.

If you already have Python installed on your machine you can use it to follow along as long as it is 2.7 or higher. It is good to note that there may be differences between the earlier versions and the current ones. Please check the Python.org website for more details on the differences between the versions.

Download Python

On the Python.Org website go to the "**Downloads**" screen.

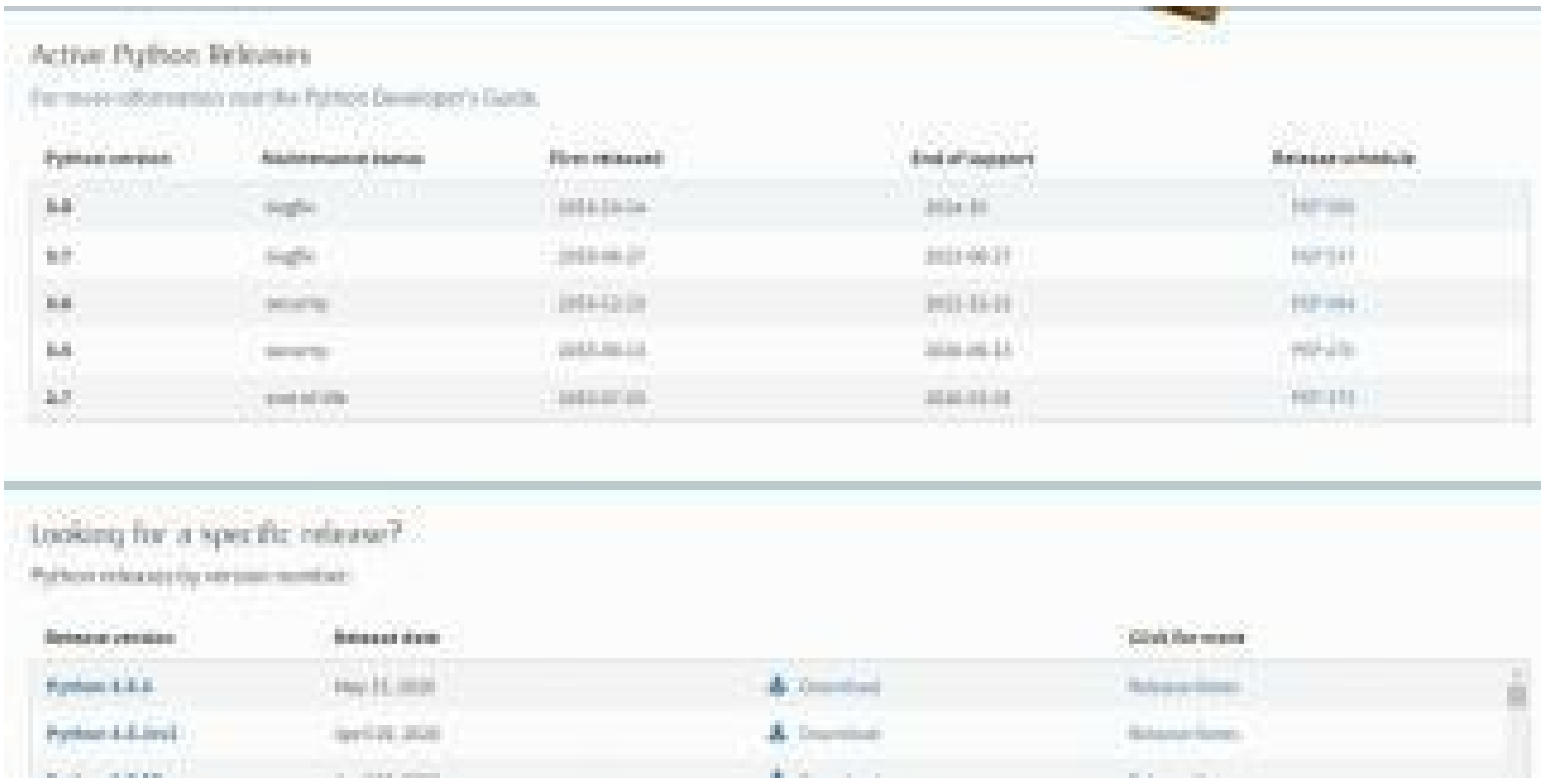


python

Download the latest version for Windows

Active Python Releases

There is the option to download earlier releases under the “**Active Python Releases**” section of the page.

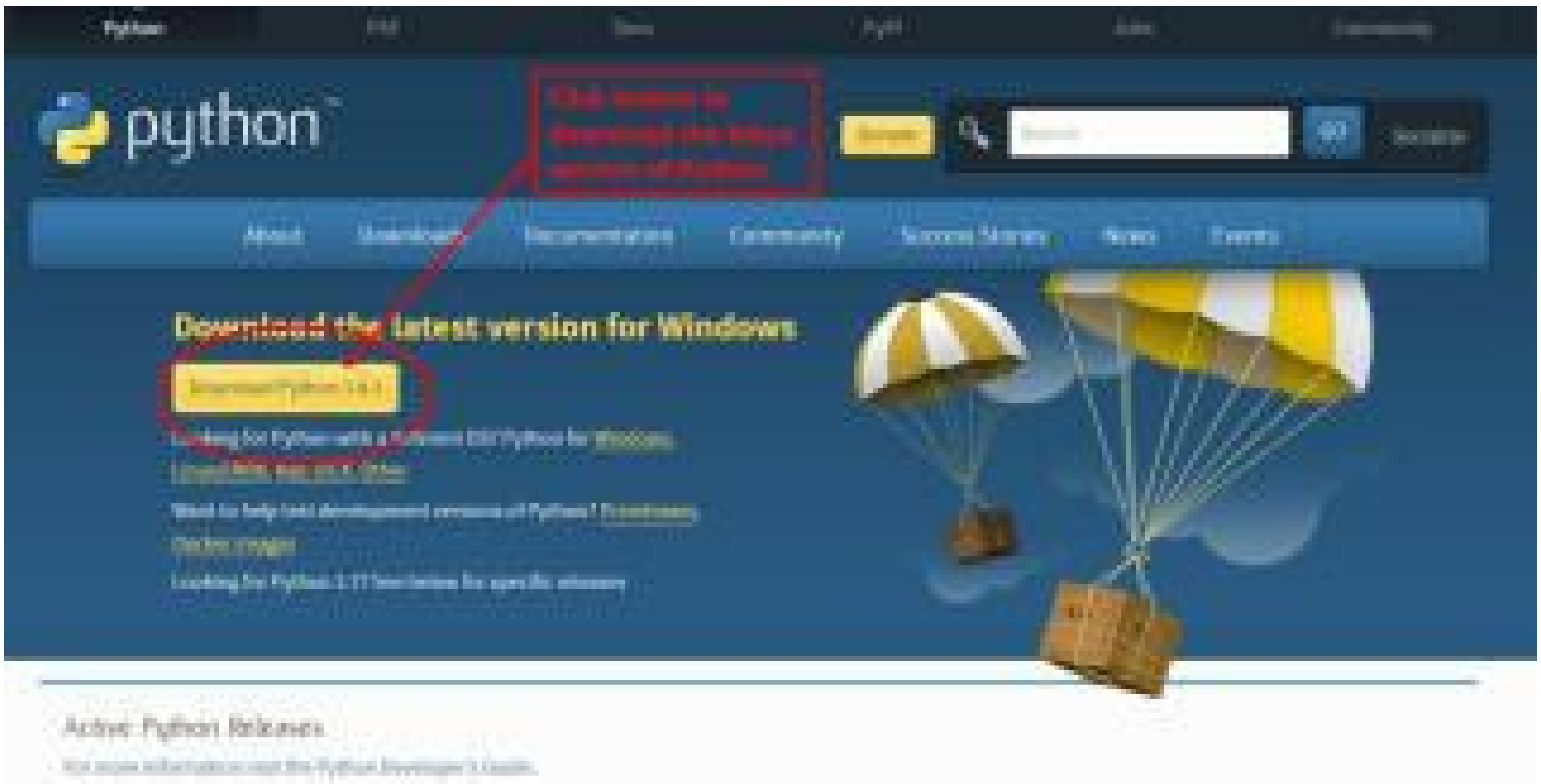


Active Python Releases

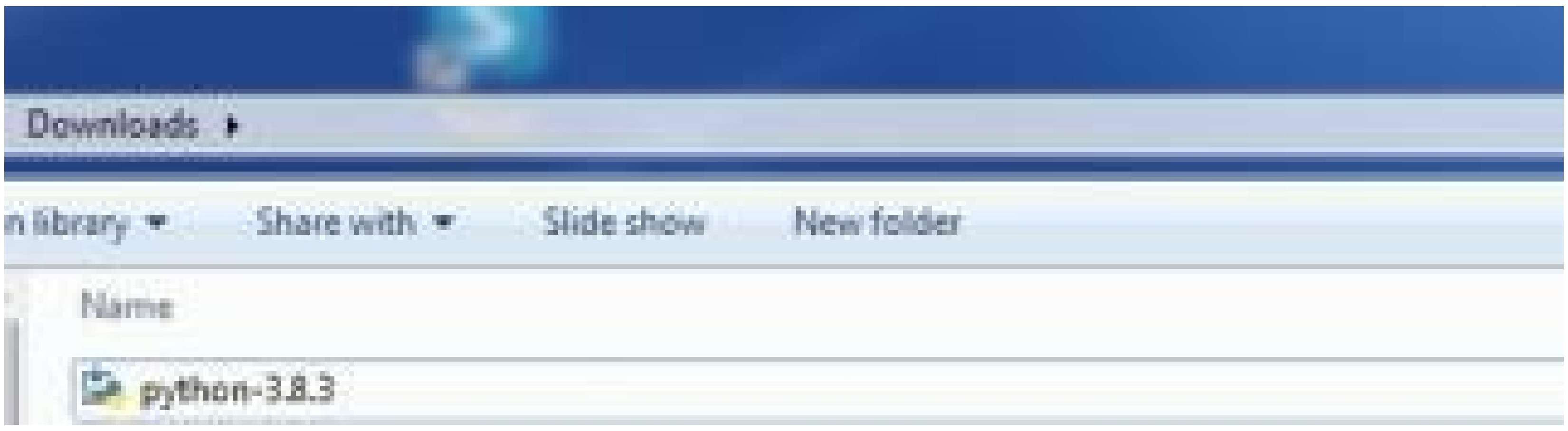
Looking for a specific release?

For this exercise you are going to use **Python 3.8.3**.

Choose the version from the “**Active Python Releases**” or click on the “**Download Python 3.8.3**” button beneath the “**Download the latest version for Windows**” section. Make sure it is the 64-bit version, as the current version of TensorFlow works best with the 64-bit.



The file will download into the “**Downloads**” folder on your computer.



Check that the file is there once the download has been completed.

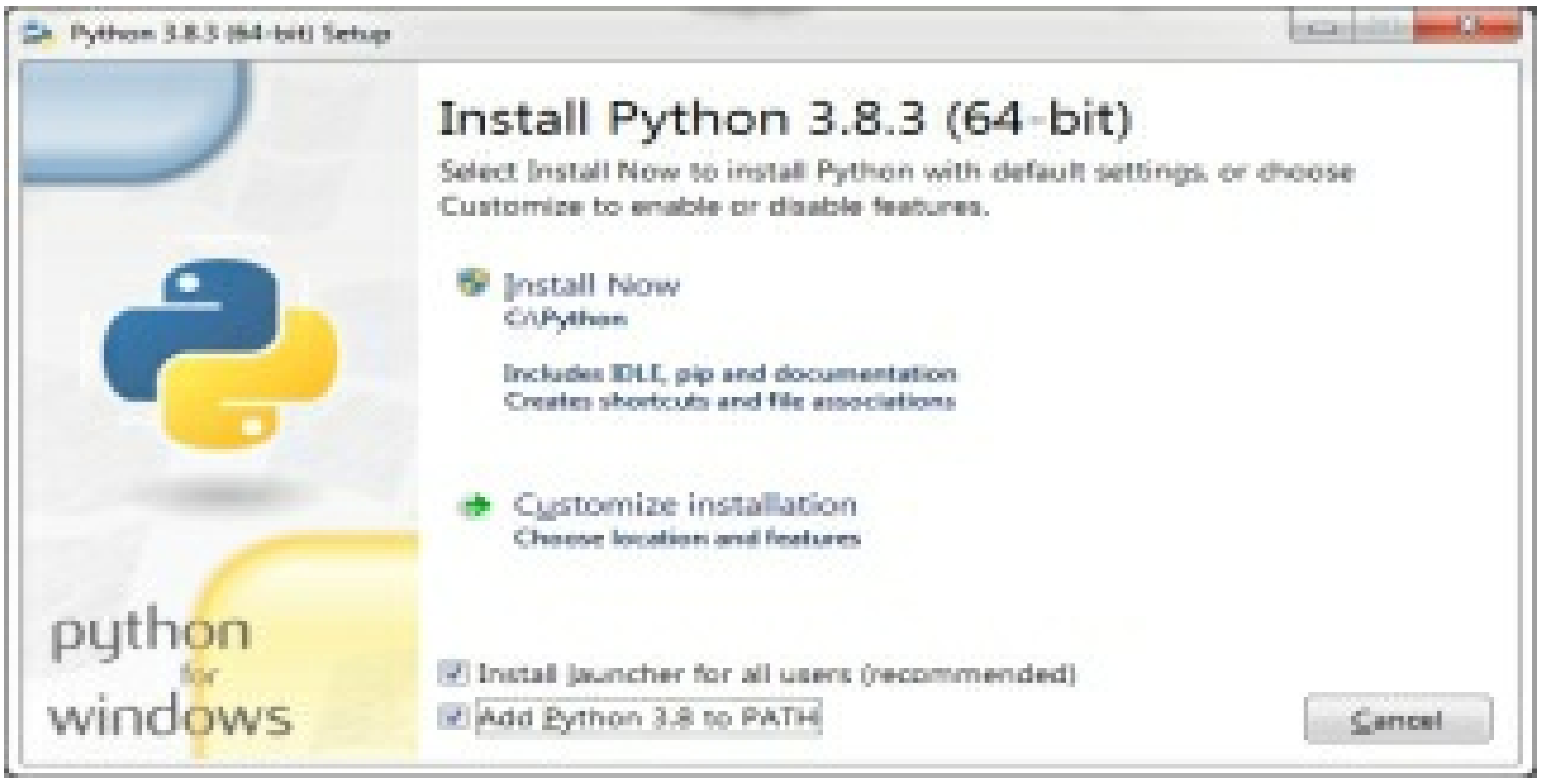
Installing Python on Windows

From the “**Downloads**” folder, double click on the “**python-3.8.3**” executable file.

Click on the “**Run**” button from the “**Open File - Security Warning**” dialogue box that will appear.

Make sure to tick the “**Add Python 3.9 to Path**” at the bottom of the “**Install Python 3.8.3 (xx-bit)**” screen. Keep the default installation directory, unless you are a more advanced user and would like to install the software in another location. For the sake of this training exercise, the default directory has not been changed to simplify the process.

Click the “**Install Now**” option on the “**Install Python 3.8.3 (xx-bit)**” screen.



Python 3.8.3 (64-bit) Setup

Install Python 3.8.3 (64-bit)

Select Install Now to install Python with default settings, or choose Customize to enable or disable features.

Install Now
C:\Python

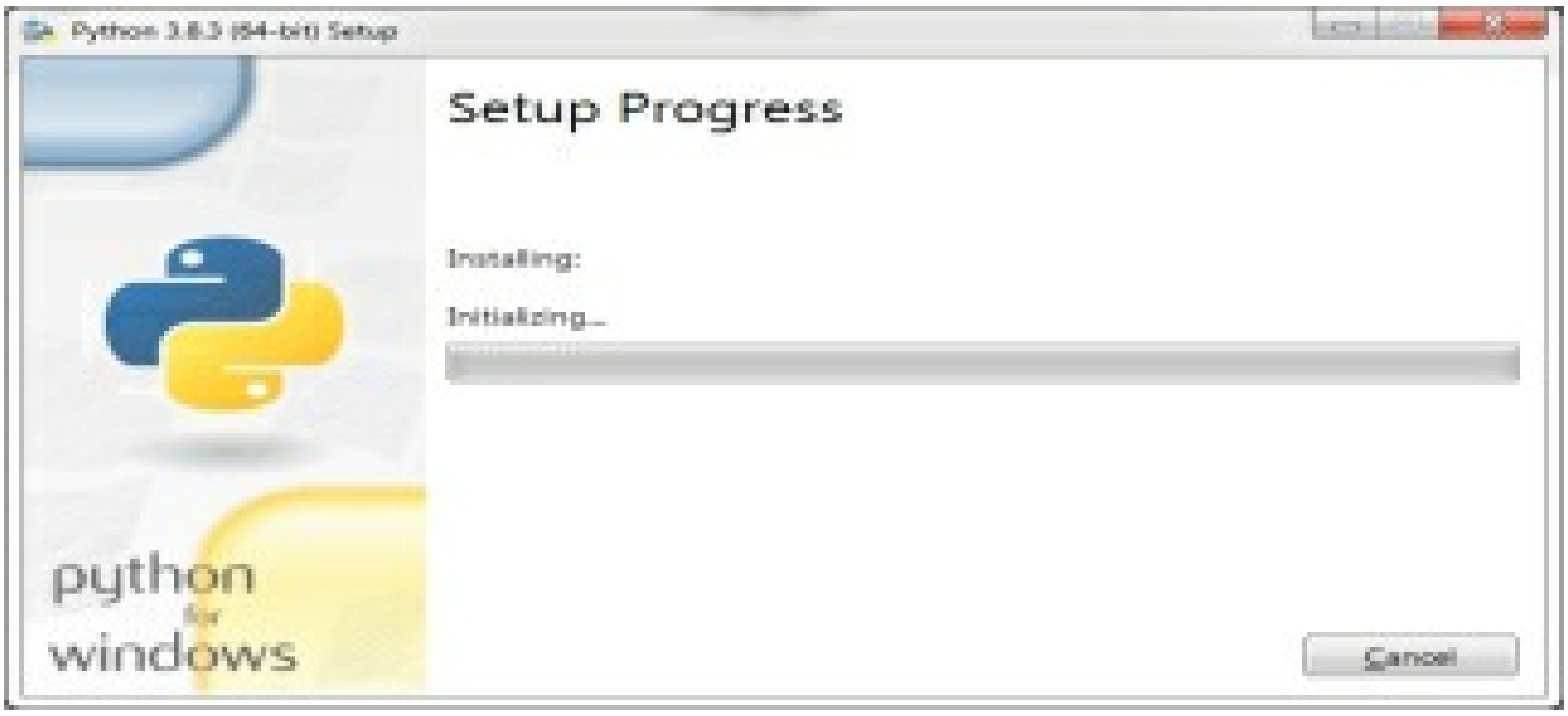
Includes IDLE, pip and documentation
Creates shortcuts and file associations

Customize installation
Choose location and features

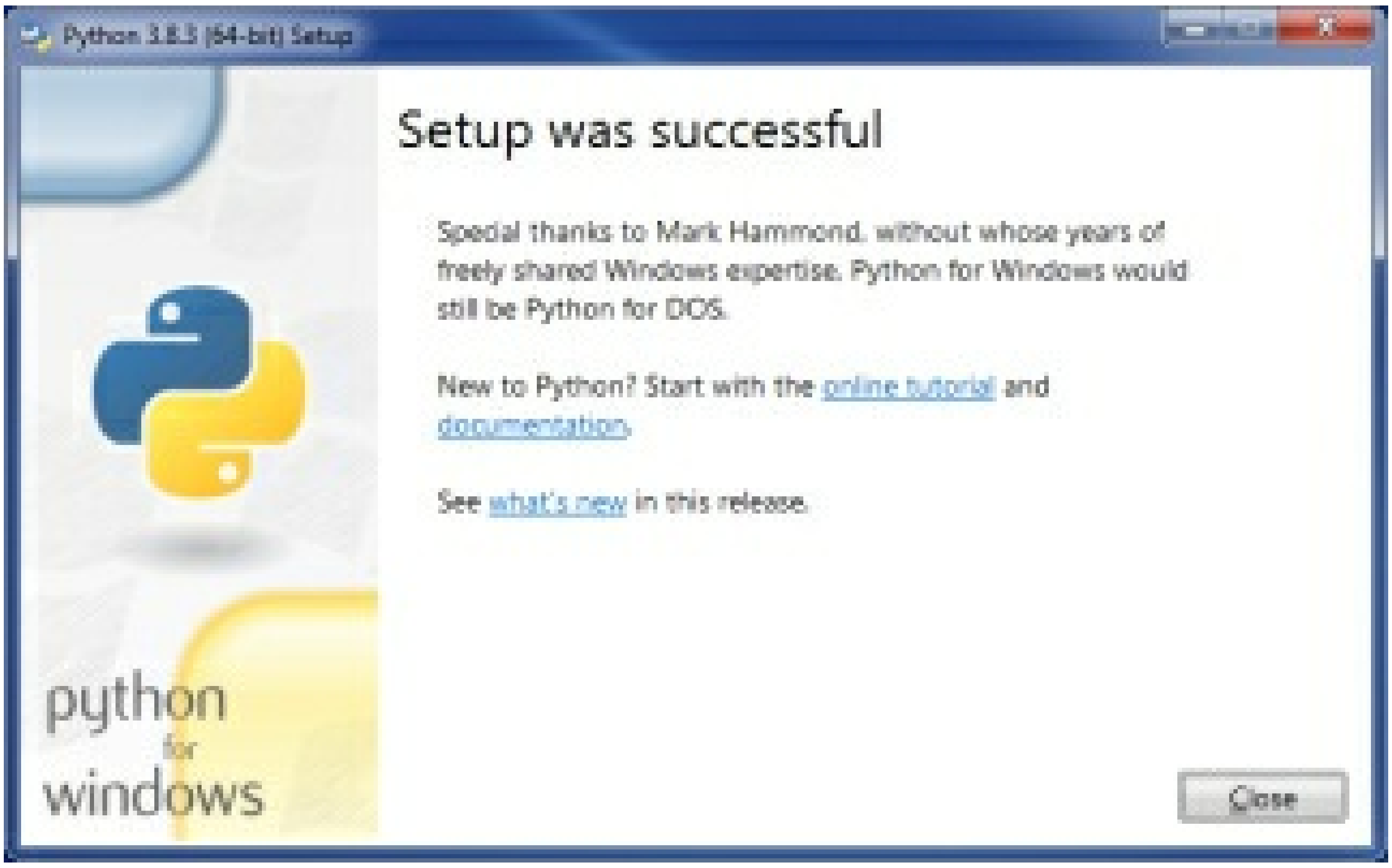
☑ Install launcher for all users (recommended)
☑ Add Python 3.8 to PATH

If the “**Access Control**” warning screen comes up, click on “**Yes**” to allow the application permission to install on the system.

The “**Setup Progress**” screen will appear with the installation progress for installing Python.



When Python is finished installing the “**Setup was successful**” screen will appear. Python will now be installed on your system.



Setup was successful

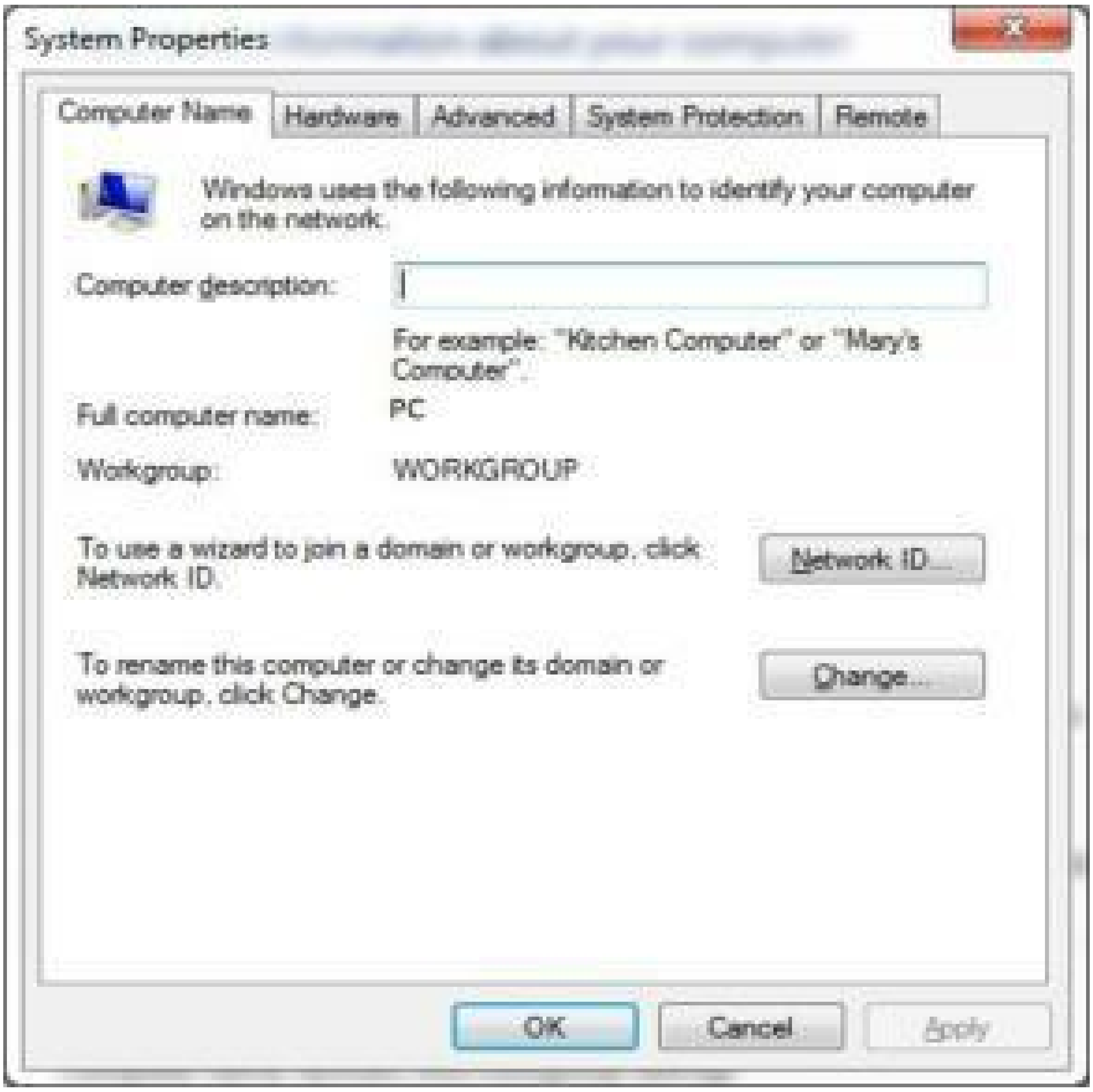
Special thanks to Mark Hammond, without whose years of freely shared Windows expertise, Python for Windows would still be Python for DOS.

New to Python? Start with the online tutorial and documentation.

See what's new in this release.

Setting Up the Python Environment

You will need to check to see if Python is running on the system. If you did not tick the “Add Python to Path” box, you will need to add it to the **System Environment Variable** path. To check if it was put into the **System Environment Variable** path, go to the “**Control Panel - System and Security - System Properties**.”



Windows uses the following information to identify your computer on the network.

Computer description:

For example: "Kitchen Computer" or "Mary's Computer".

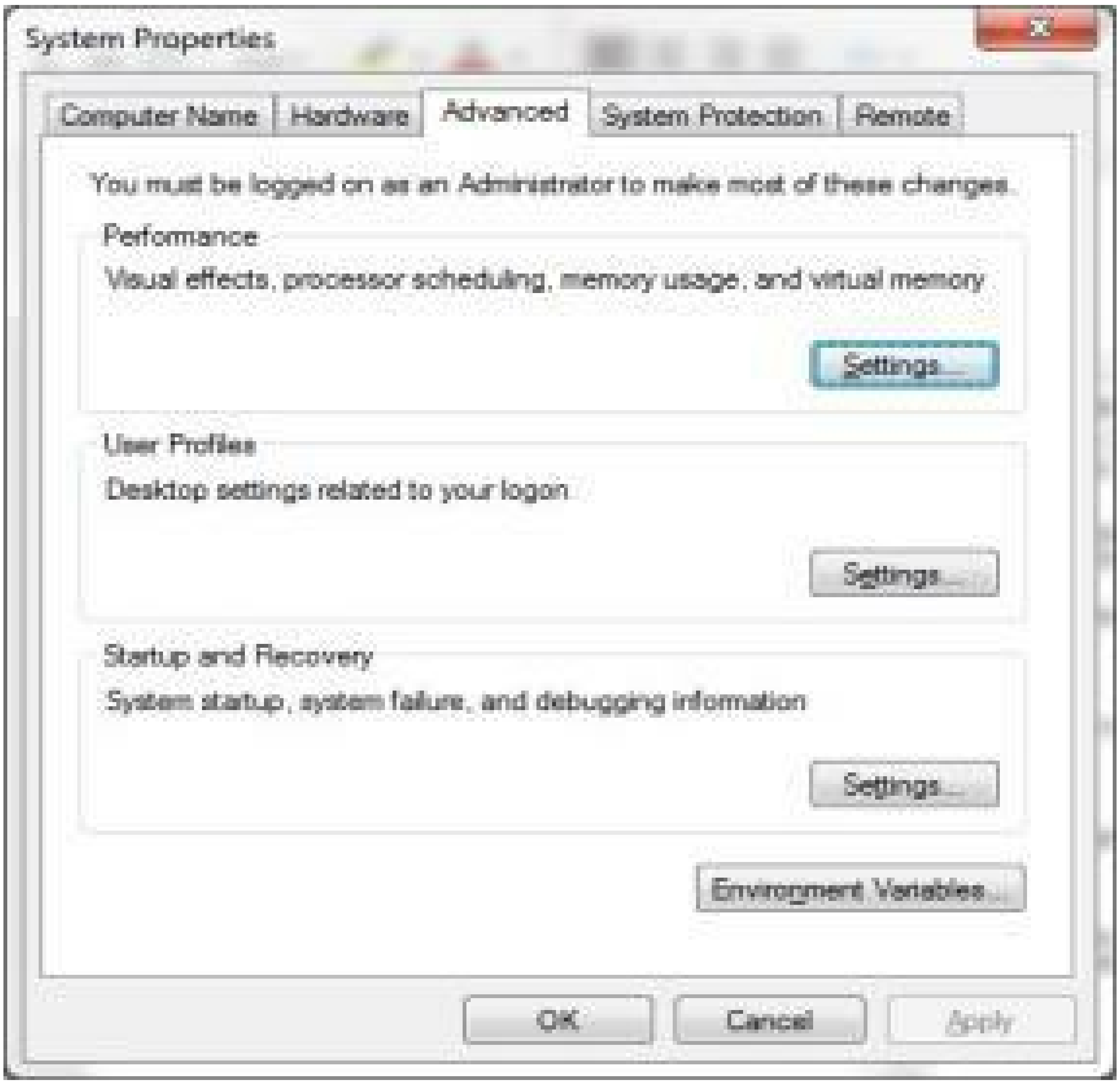
Full computer name: PC

Workgroup: WORKGROUP

To use a wizard to join a domain or workgroup, click Network ID.

To rename this computer or change its domain or workgroup, click Change.

Click on the “**Advanced**” tab.



You must be logged on as an Administrator to make most of these changes.

Performance

Visual effects, processor scheduling, memory usage, and virtual memory

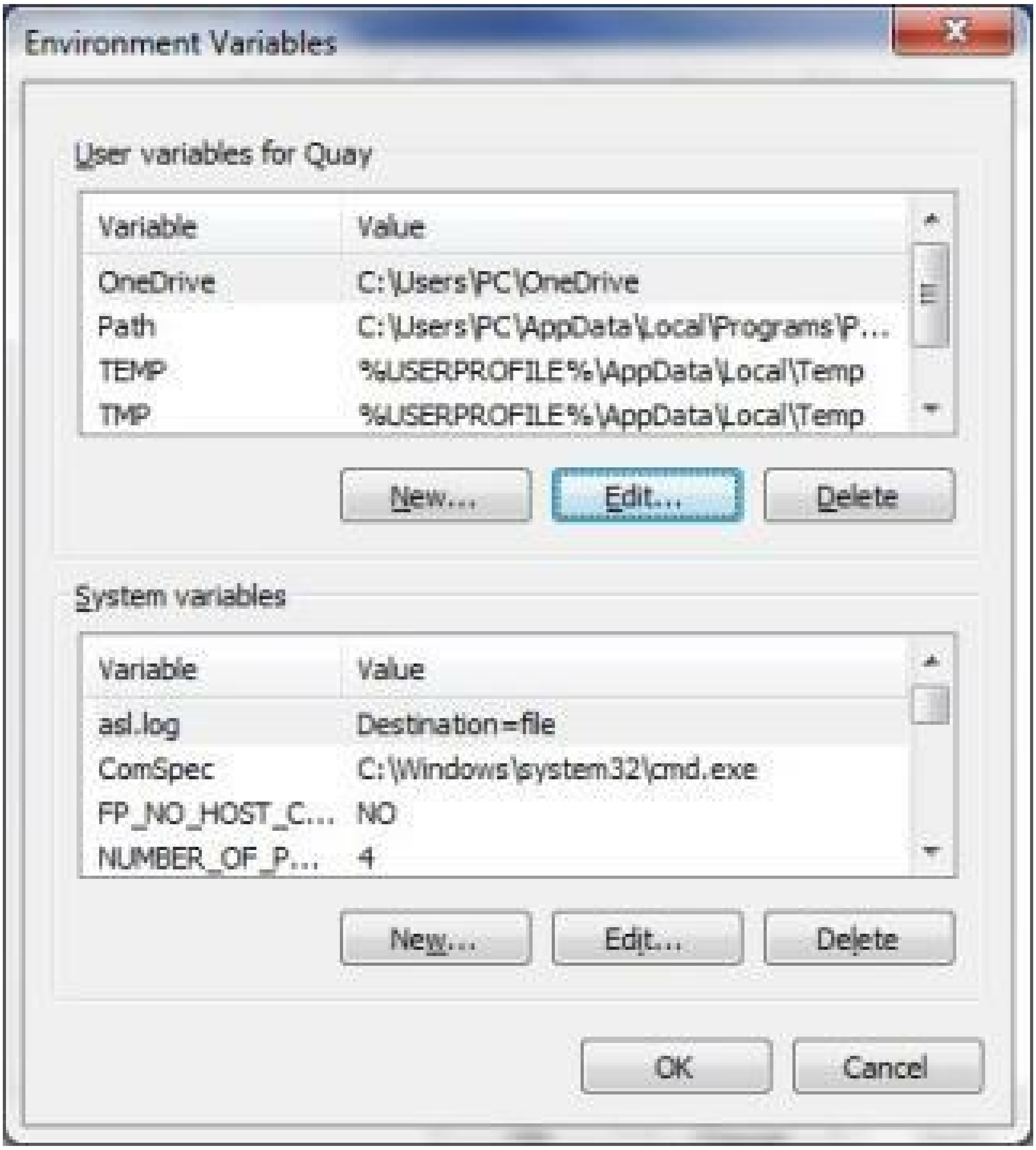
User Profiles

Desktop settings related to your logon

Startup and Recovery

System startup, system failure, and debugging information

Click on the “**Environment Variables**” button.



Environment Variables

User variables for Quay

Variable	Value
OneDrive	C:\Users\PC\OneDrive
Path	C:\Users\PC\AppData\Local\Programs\P...
TEMP	%USERPROFILE%\AppData\Local\Temp
TMP	%USERPROFILE%\AppData\Local\Temp

System variables

Variable	Value
asl.log	Destination=file
ComSpec	C:\Windows\system32\cmd.exe
FP_NO_HOST_C...	NO
NUMBER_OF_P...	4

Click on “**Path**” under “System variables” and then the “**Edit**” button.

For systems earlier than Windows 10, you will need to place your cursor at the end of the “**Variable value**” path to check if the following line (or similar, depending on where you installed Python) appears. For Windows 10 you will add a new path to the list of variables.

The following variable path should appear in the “**Variable value**” box:

;C:\Python\Python 38-32\

If there is no reference to the Python.exe file, find the path to the Python executable file and type it in here as per the example above. **NOTE:** Do not forget to separate each system path variable entry with a “;” for Windows OS earlier than Windows 10, or it will create problems and not pick up the application. When you are done checking the System path variable click “**OK**” until you have exited the **System Variable** screen. You can also close down the “**Control Panel**” before moving on to test the Python installation.

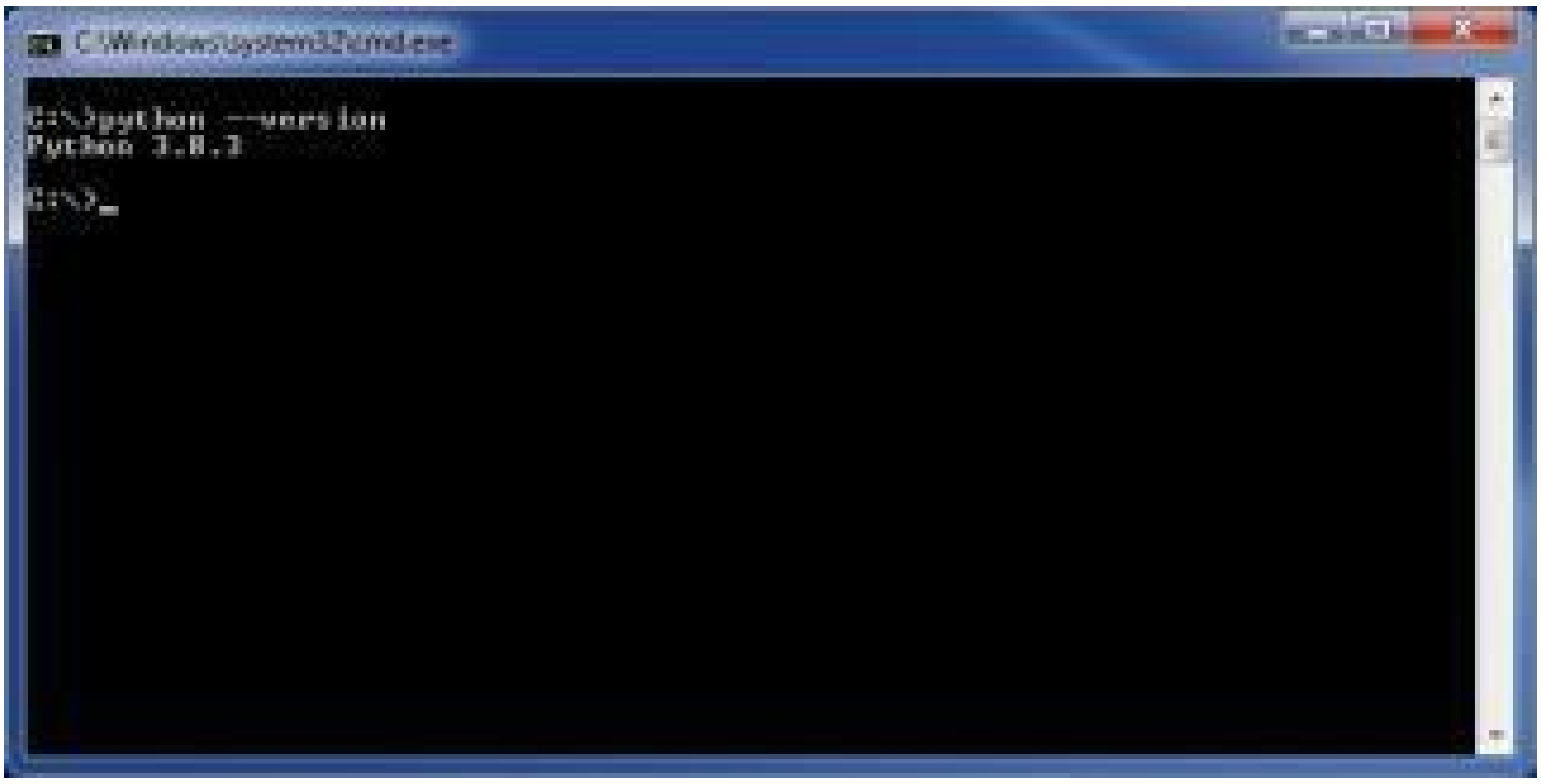
From the Start menu, type **cmd** in the search box and hit enter. This will load the command line screen to test that the Python installation installed correctly and can be accessed. The following screen (or similar) will appear:

```
C:\>
```

To test the Python installation type the following into the command line:

```
python --version
```

The following or similar should appear on the screen:



```
C:\>python --version
Python 3.8.3

C:\>_
```

The version of Python that was recently installed on the machine should appear beneath the command you typed in. If it does not appear there, you will need to check the **System Variable Path**.

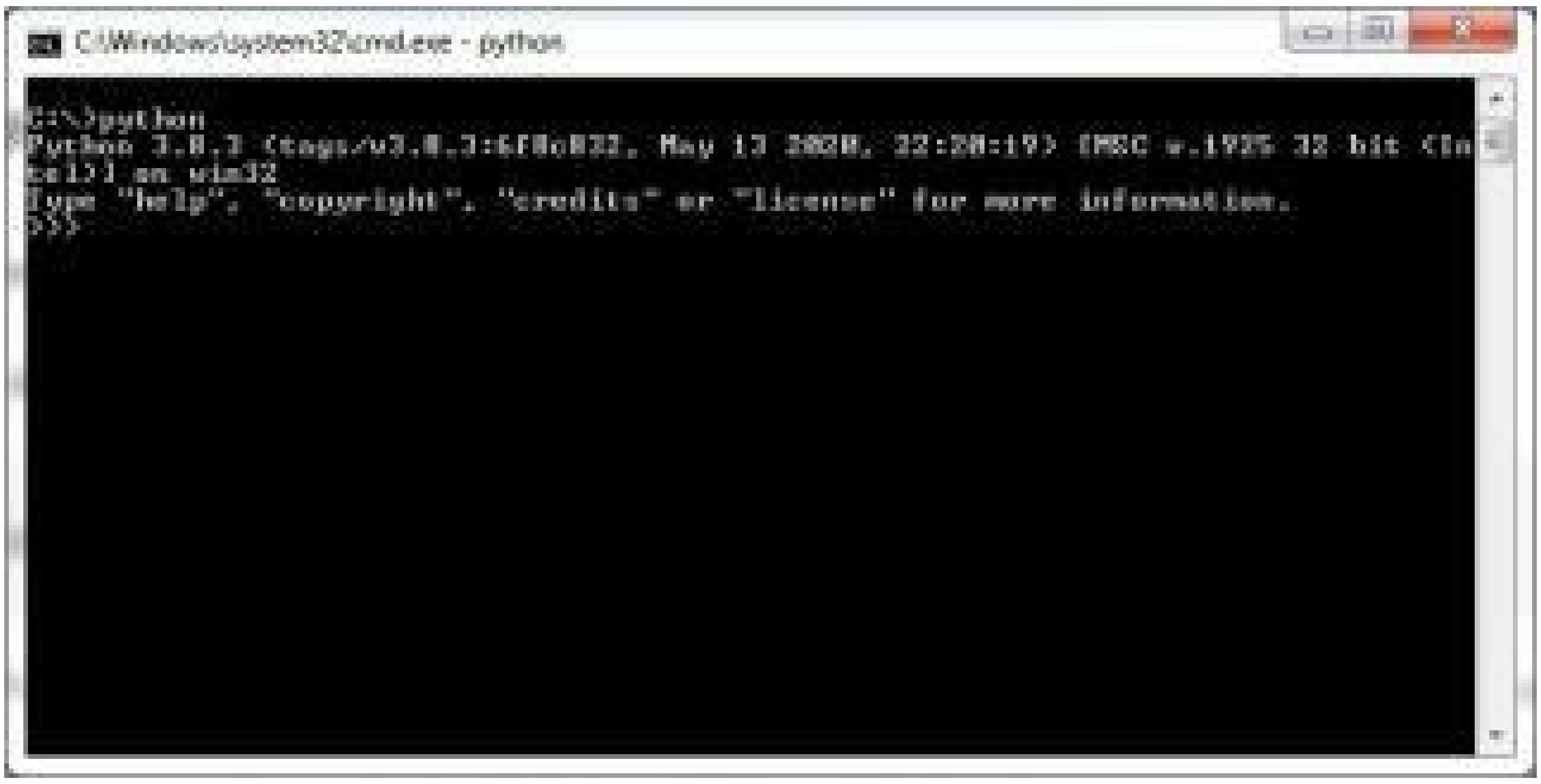
There are a few ways to load the Python command line:

- Create a desktop shortcut
- Access Idle or the Python command line from the “**Start**” menu “**Programs**” option
- Access Python through the **DOS** command line using **cmd** from the “**Start**” menu **run**/**search** facility.

For the sake of this exercise the **cmd** option is going to be used.

From the cmd command line prompt type:

```
python
```



```
C:\>python
Python 3.8.3 (tags/v3.8.3:6f8c832, May 13 2020, 22:20:19) [MSC v.1925 32 bit (In
tel)] on win32
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

If you are going to be using Python you will need to use **pip** (Preferred Installer Program). **Pip** is the package installer for Python and if you have Python version 2.7 and higher, it should already be installed with Python. To check that **pip** is installed, type the following into the Python command line:

pip --version

It should return the version of pip. If it is older than 20.1.1 (the new version at the time of writing this book is version 20.1.1) then **pip** will need to be upgraded. In order to be able to run **pip** from the command line, you can add the **pip** program path to the System Environment Variable Path as you did for the Python executable. The **pip** executable file is usually found in the following Python directory:

<Python installation path>\Python\Python38-32\Scripts

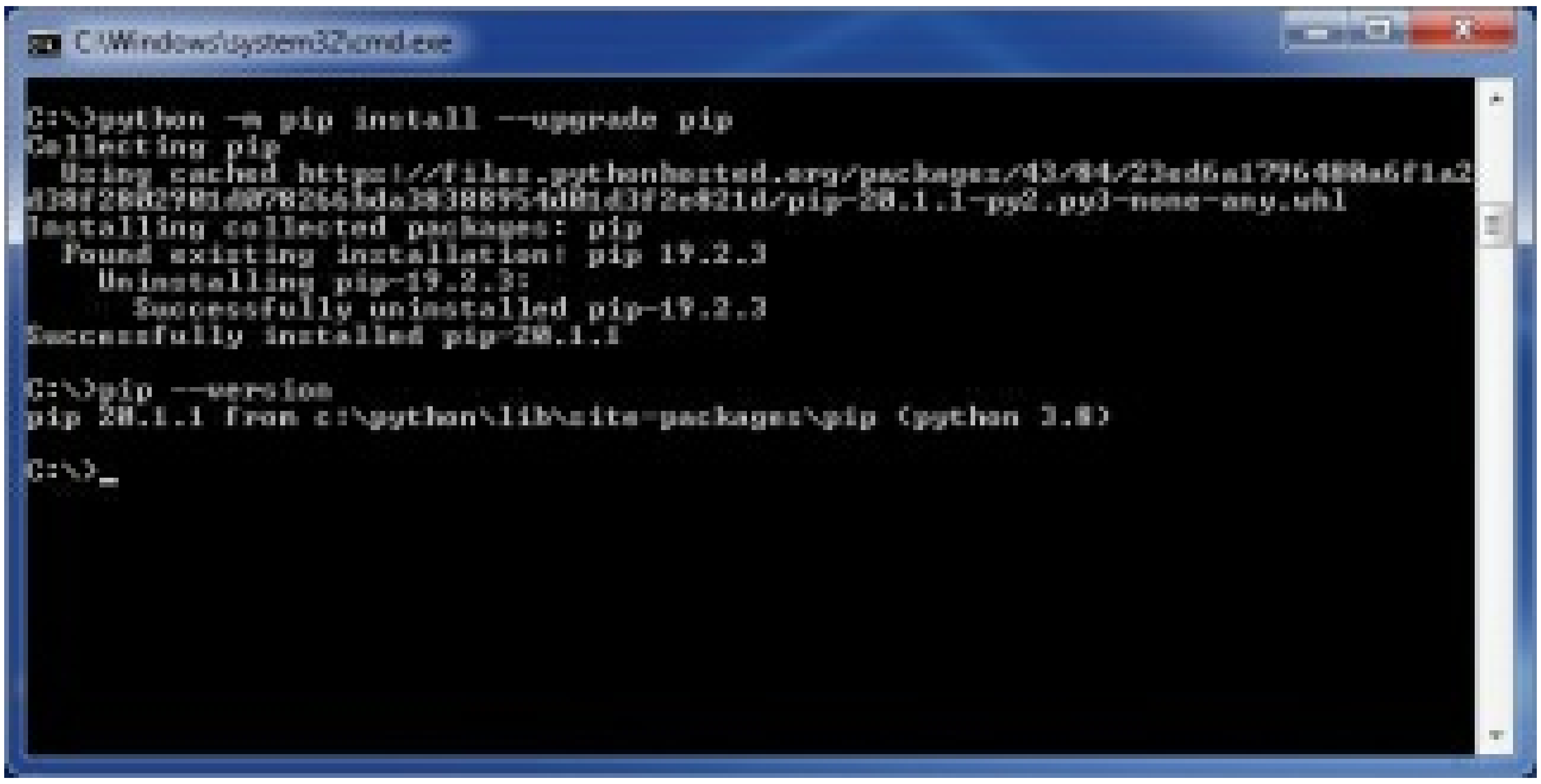
To upgrade **pip** type the following into the command line prompt:

python -m pip install --upgrade pip

When the **pip** upgrade is finished type:

pip --version

The version should be 20.1.1



```
C:\>python -m pip install --upgrade pip
Collecting pip
  Using cached https://files.pythonhosted.org/packages/43/84/23ed6a1796480a6f1a2
d38f2802901d078266bda38388954d01d3f2e821d/pip-20.1.1-py2.py3-none-any.whl
Installing collected packages: pip
  Found existing installation: pip 19.2.3
    Uninstalling pip-19.2.3:
      Successfully uninstalled pip-19.2.3
Successfully installed pip-20.1.1

C:\>pip --version
pip 20.1.1 from c:\python\lib\site-packages\pip (python 3.8)

C:\>_
```

The Python **pip** utility should now be the latest version.

Install NumPy With Pip

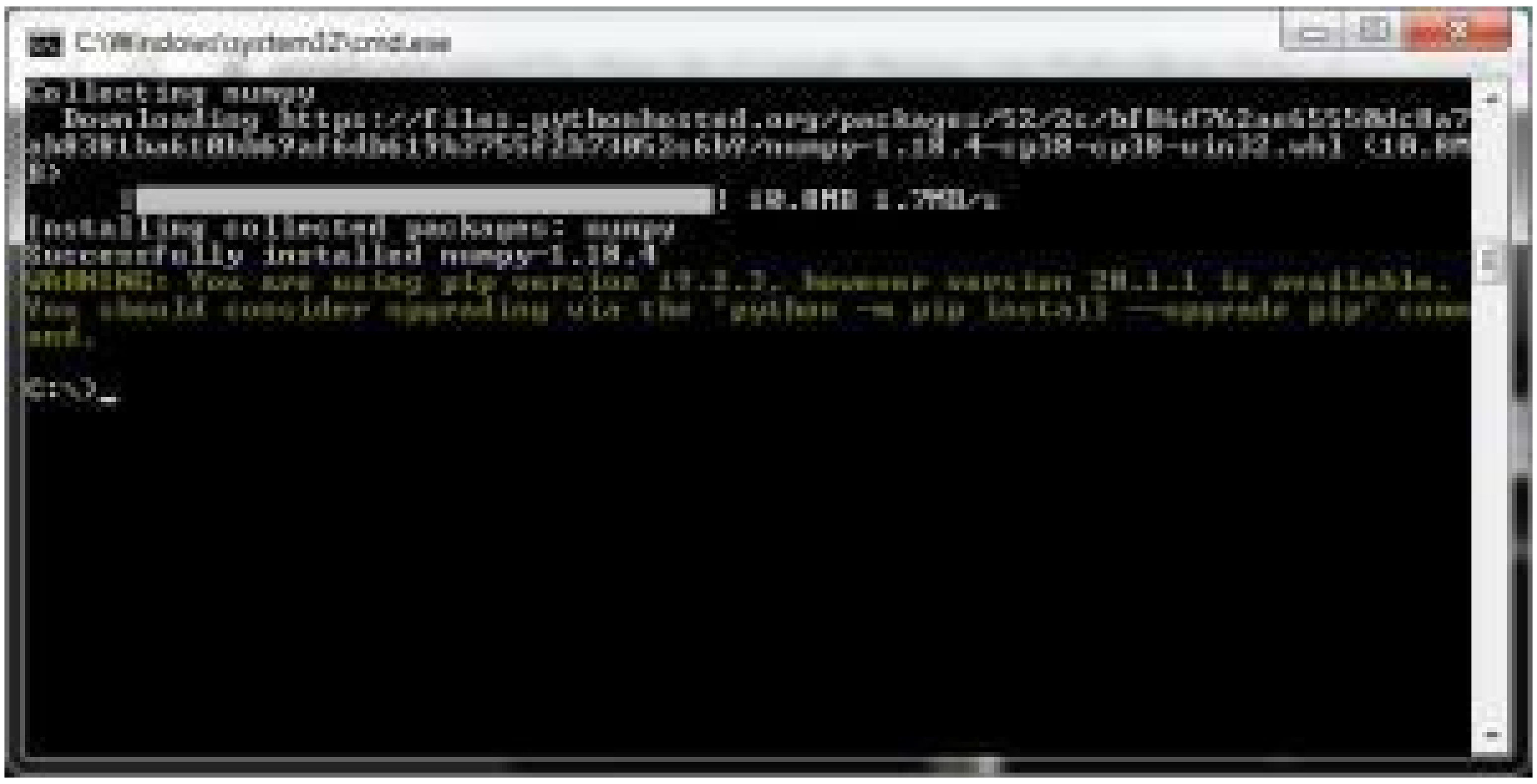
Now you need to check if the NumPy library is installed. NumPy is needed for the support of matrices, high-level math functions, and multi-dimensional arrays that are large. You can check if NumPy was pre-installed with Python by using the following test on the Python command line:

```
import numpy
```

If the command line returns an error “**No module named ‘numpy’**” you will need to get the library. At the command line prompt type the following:

```
pip install numpy
```

If you have pip loaded and referenced correctly in the System Variable Path, pip will download and install the NumPy library as per the image below.



```
Collecting numpy
  Downloading https://files.pythonhosted.org/packages/52/2c/bf0d762a6555Bdc8a7
ab4301ba610b069afdb619b2755f2373052e6b9/numpy-1.18.4-cp38-cp38-win32.whl (10.8M
B)
     |████████████████████████████████| 10.8MB 1.7MB/s
Installing collected packages: numpy
Successfully installed numpy-1.18.4
WARNING: You are using pip version 19.2.3, however version 20.1.1 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' comm
and.

C:\>_
```

Install SciPy With Pip

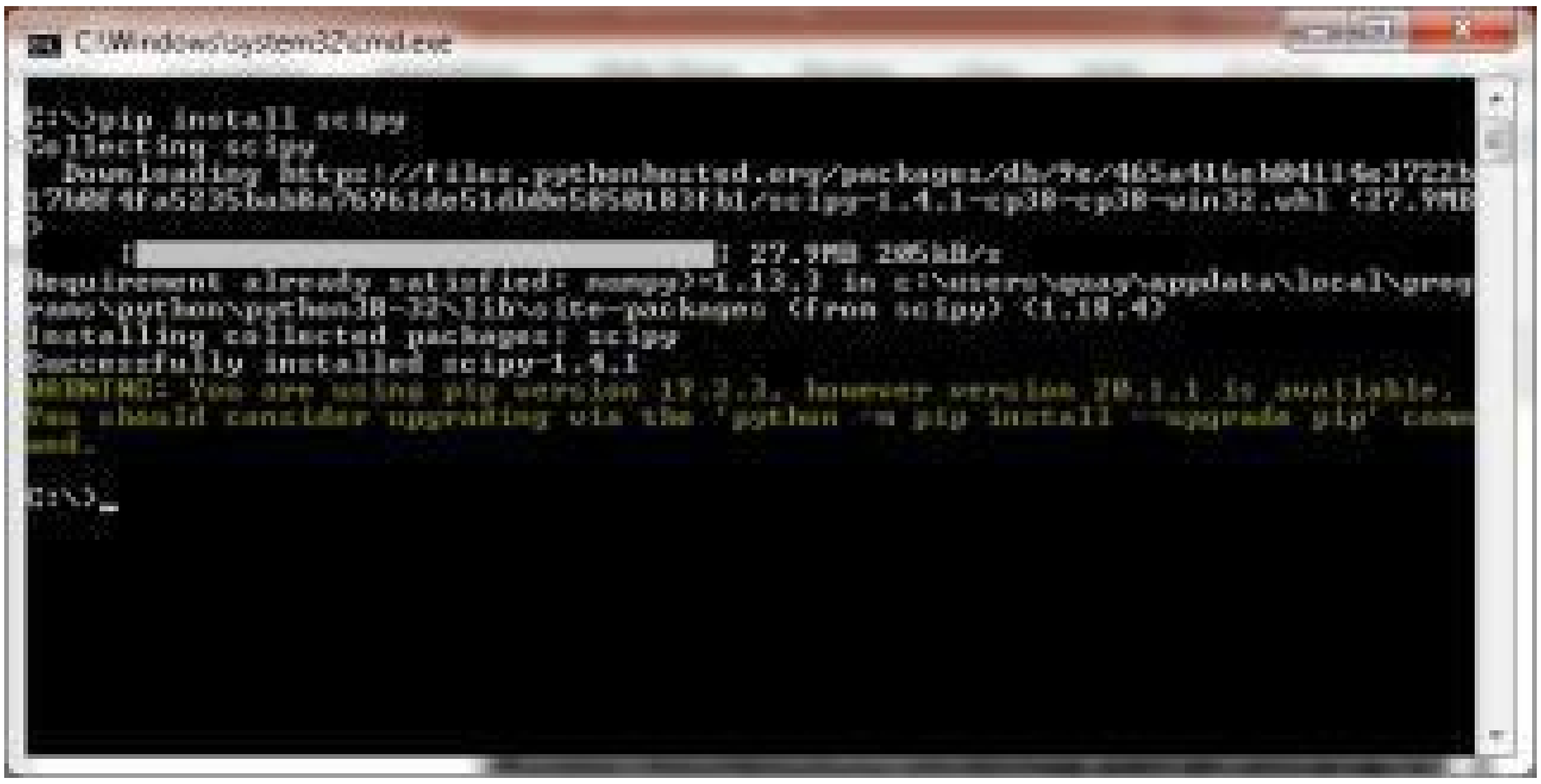
Now you need to check if the SciPy library is installed. You can check if SciPy was pre-installed with Python by using the following test on the Python command line:

```
import scipy
```

If the command line returns an error “**No module named ‘scipy’**” you will need to get the library. At the command line prompt type the following:

```
pip install scipy
```

If you have **pip** loaded and referenced correctly in the System Variable Path, **pip** will download and install the SciPy library as per the image below.



```
C:\>pip install scipy
Collecting scipy
  Downloading https://files.pythonhosted.org/packages/db/9e/465a416eb04114e3722b
17b0f4fa5235ba88a76961de51d0e5850183fb1/scipy-1.4.1-cp38-cp38-win32.whl (27.9MB
)
     |████████████████████████████████| 27.9MB 205kB/s
Requirement already satisfied: numpy>=1.13.3 in c:\users\guay\appdata\local\prog
rams\python\python38-32\lib\site-packages (from scipy) (1.18.4)
Installing collected packages: scipy
Successfully installed scipy-1.4.1
WARNING: You are using pip version 19.2.3, however version 20.1.1 is available.
You should consider upgrading via the 'python -m pip install --upgrade pip' comm
and.

C:\>_
```

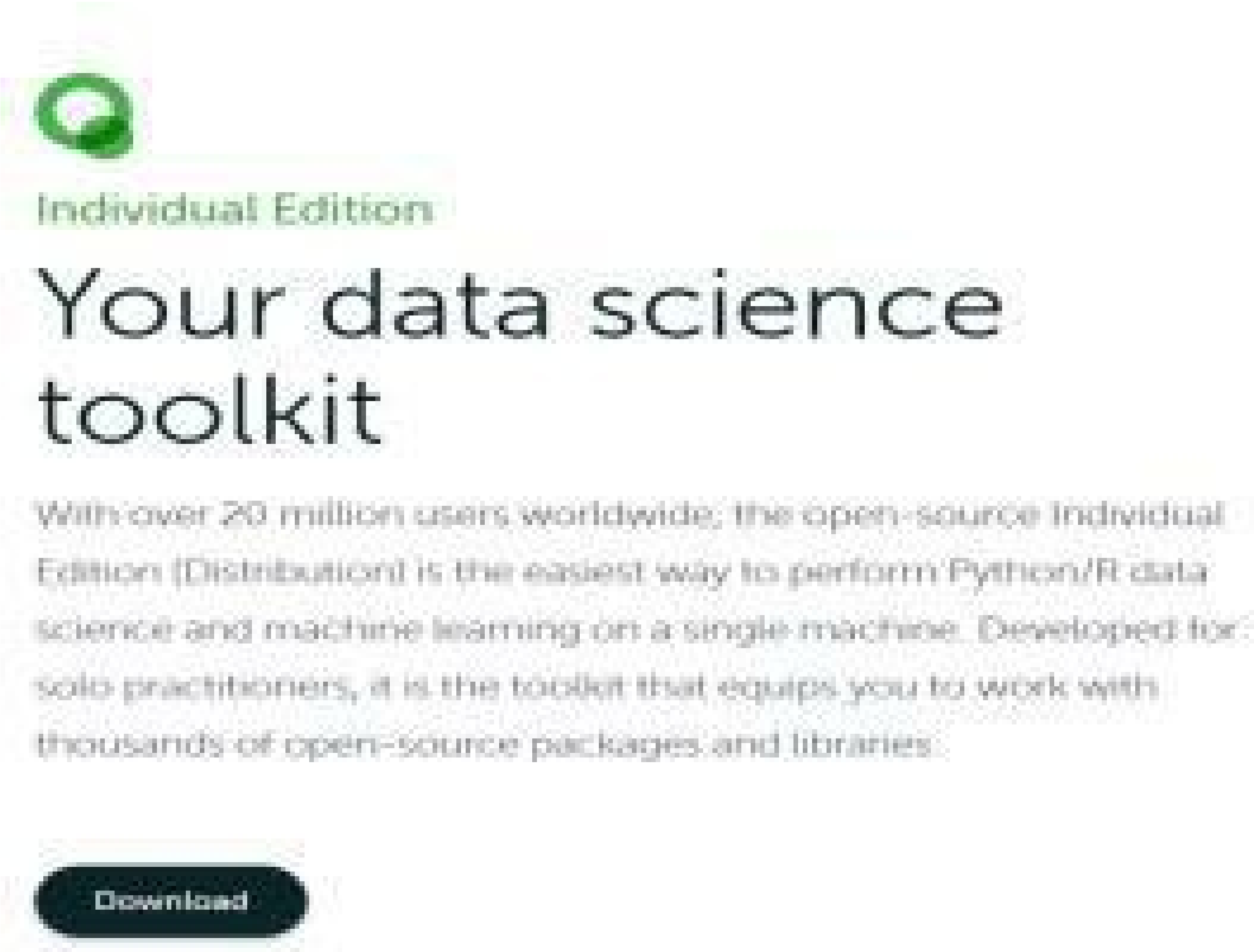
Installing Anaconda

The latest version of Anaconda is 3.7 and it can be retrieved from the Anaconda.com website. For the sake of this book, version 3.7 64-bit will be used to keep the book up to date at time of print. The 64-bit version is advisable as TensorFlow works best with 64-bit. As TensorFlow is open source software, it is free to download and use.

If you already have Anaconda installed on your machine, you can use it to follow along as long as it is 2.7 or higher. It is good to note that there may be differences between the earlier versions and the current ones. Please check the Anaconda.com website for more details on the differences between the versions.

Download Anaconda

On the Anaconda.com website, scroll down the page until you find the “**Downloads**” button.

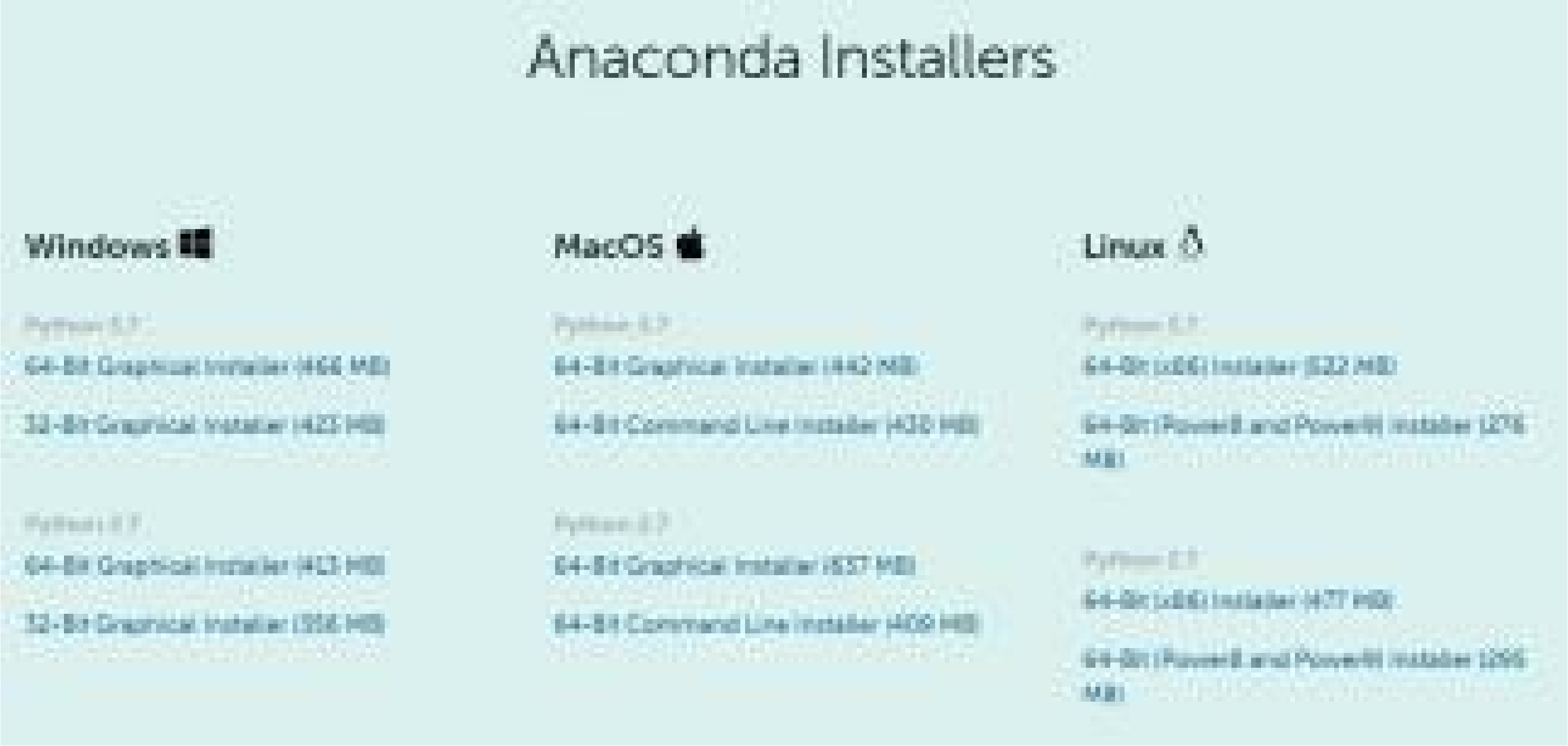


Individual Edition

Your data science toolkit

With over 20 million users worldwide, the open-source Individual Edition (Distribution) is the easiest way to perform Python/R data science and machine learning on a single machine. Developed for solo practitioners, it is the toolkit that equips you to work with thousands of open-source packages and libraries.

There is an option to download earlier releases under the “**Anaconda Installers**” section of the page.



Anaconda Installers

Windows

Python 3.7

64-Bit Graphical Installer (466 MB)

32-Bit Graphical Installer (423 MB)

Python 2.7

64-Bit Graphical Installer (413 MB)

32-Bit Graphical Installer (356 MB)

MacOS

Python 3.7

64-Bit Graphical Installer (442 MB)

64-Bit Command Line Installer (430 MB)

Python 2.7

64-Bit Graphical Installer (637 MB)

64-Bit Command Line Installer (409 MB)

Linux

Python 3.7

64-Bit (x86) Installer (522 MB)

64-Bit (Power8 and Power9) Installer (276 MB)

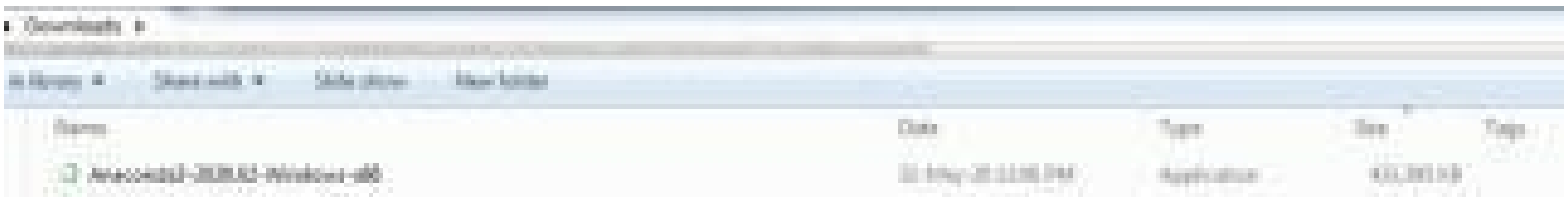
Python 2.7

64-Bit (x86) Installer (477 MB)

64-Bit (Power8 and Power9) Installer (295 MB)

For this exercise you are going to use the **Python 3.7** version which relates to your machine (i.e. 32-bit or 64-bit).

Choose the version from the “**Anaconda Installers**” screen and it will start to download the installer file into the “**Downloads**” folder on the machine.



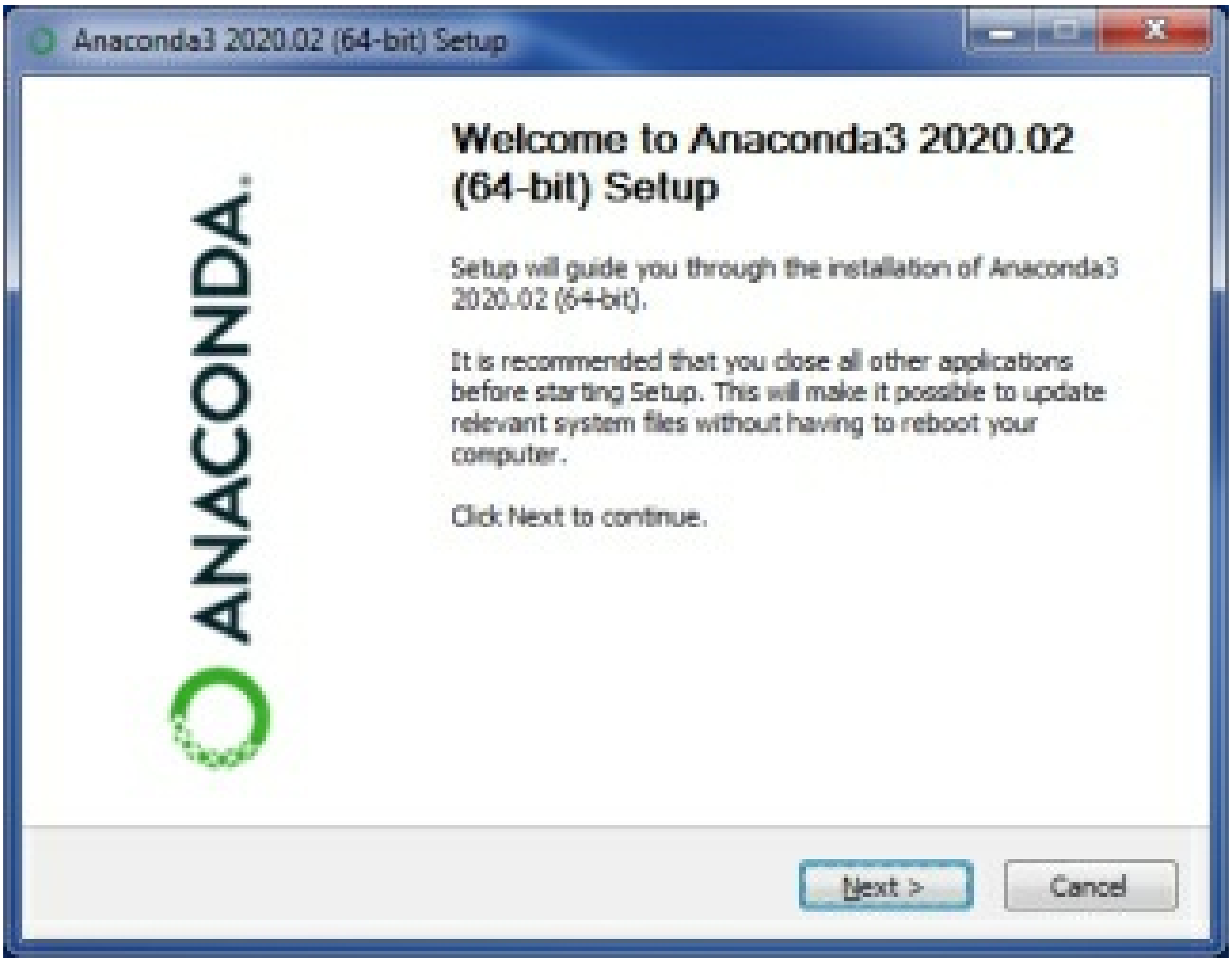
Check that the file is there once the download has been completed.

Installing Anaconda on Windows

From the “**Downloads**” folder, double click on the “**Anaconda3.2020.02-Windows-xx**” executable file.

Click on the “**Run**” button from the “**Open File - Security Warning**” dialogue box that will appear.

Click “**Next**” at the bottom of the “**Welcome to Anaconda3 2020.02 (xx-bit) Setup**” screen.



Anaconda3 2020.02 (64-bit) Setup

Welcome to Anaconda3 2020.02 (64-bit) Setup

Setup will guide you through the installation of Anaconda3 2020.02 (64-bit).

It is recommended that you close all other applications before starting Setup. This will make it possible to update relevant system files without having to reboot your computer.

Click Next to continue.

Click the “**I Agree**” button on the “**ANACONDA License Agreement**” screen.

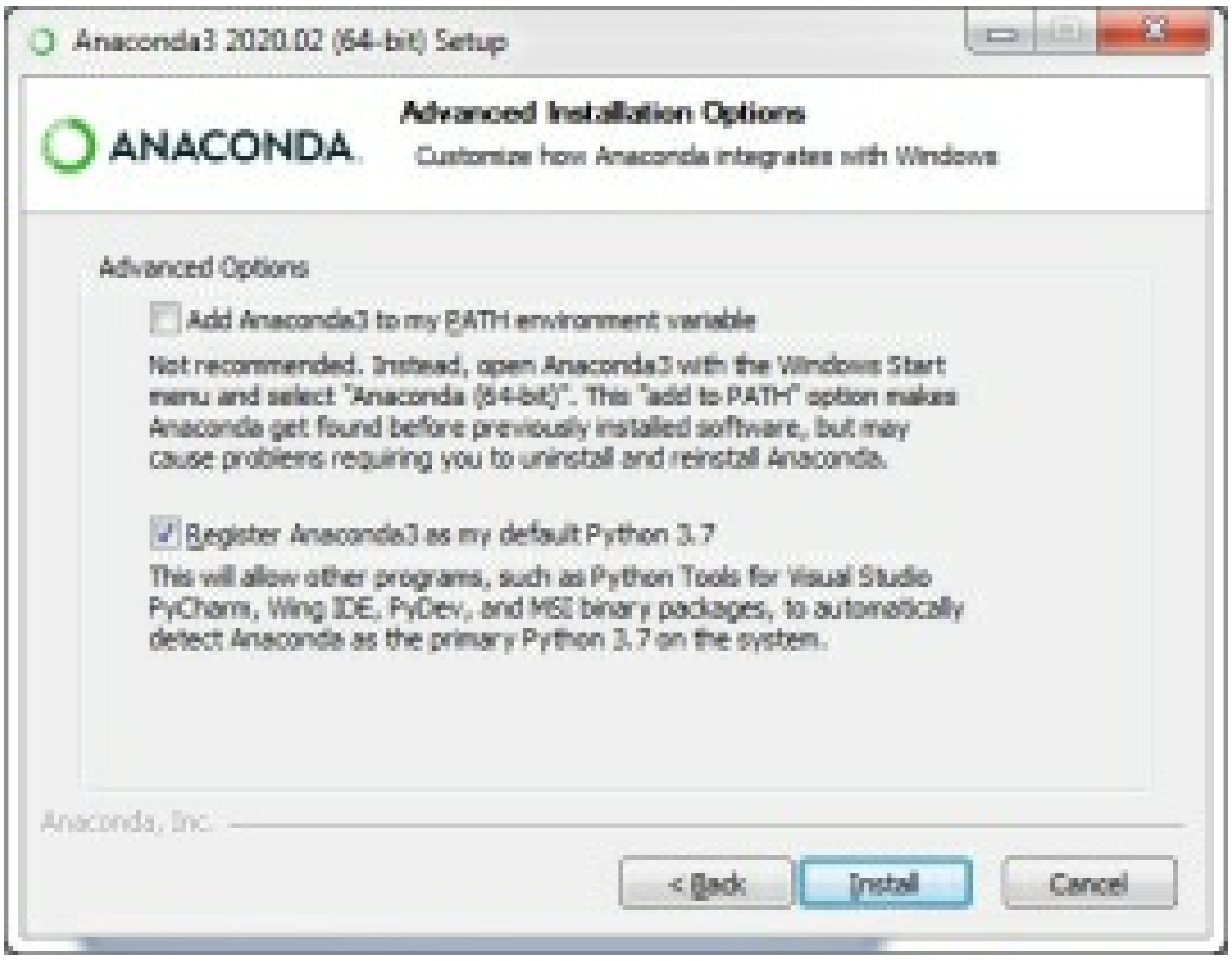
Choose either “**Just me (recommended)**” or “**All Users (requires admin privileges)**” depending on your preferences at the “**Select Installation Type**” screen.

At the “Choose Install Location” screen, it is recommended to keep the default installation directory or set it to the directory of your choice. The directory for the sake of this book will be:

```
C:\anaconda3
```

Click the “**Next**” button when you are ready to proceed with the installation.

At the “**Advanced Installation Options**” screen, leave the “Add Anaconda3 to my PATH environment variable” **UNCHECKED**. This will be added later after the installation is complete. You can leave the “**Register Anaconda3 as my default Python 3.7**” **CHECKED**.



Anaconda3 2020.02 (64-bit) Setup

ANACONDA

Advanced Installation Options

Customize how Anaconda integrates with Windows

Advanced Options

□ Add Anaconda3 to my PATH environment variable

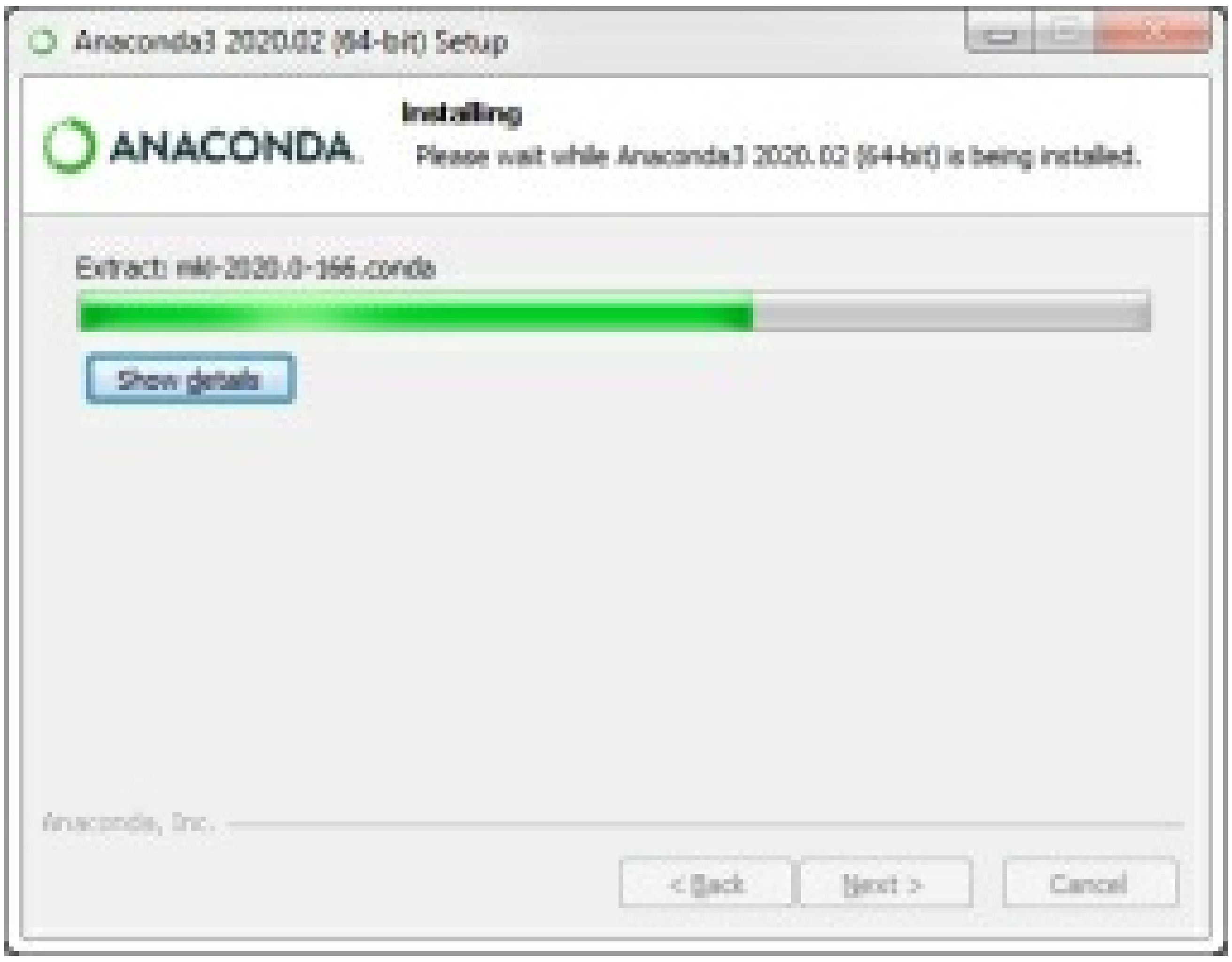
Not recommended. Instead, open Anaconda3 with the Windows Start menu and select "Anaconda (64-bit)". This "add to PATH" option makes Anaconda get found before previously installed software, but may cause problems requiring you to uninstall and reinstall Anaconda.

☑ Register Anaconda3 as my default Python 3.7

This will allow other programs, such as Python Tools for Visual Studio PyCharm, Wing IDE, PyDev, and MSI binary packages, to automatically detect Anaconda as the primary Python 3.7 on the system.

Click the “**Install**” button at the bottom of the screen to continue the installation process. The installation will continue with a progress bar indicating the installation progress.

When Anaconda is finished installing the “**Installation Complete**” screen will appear. Anaconda will now be installed on your system.



Anaconda3 2020.02 (64-bit) Setup

ANACONDA

Installing

Please wait while Anaconda3 2020.02 (64-bit) is being installed.

Extract: mkl-2020.0-166.conda

Click the “**Next**” button which will take you to an informational screen.

Press the “**Next**” button to be taken to the “**Completing Anaconda3 2020.02 (xx-bit) Setup**” screen. Uncheck the “**Anaconda Individual Tutorial**” and “**Learn More About Anaconda**” then click the “**Finish**” button.

Setting Up the Anaconda Environment

There are a few ways to load the Anaconda command line:

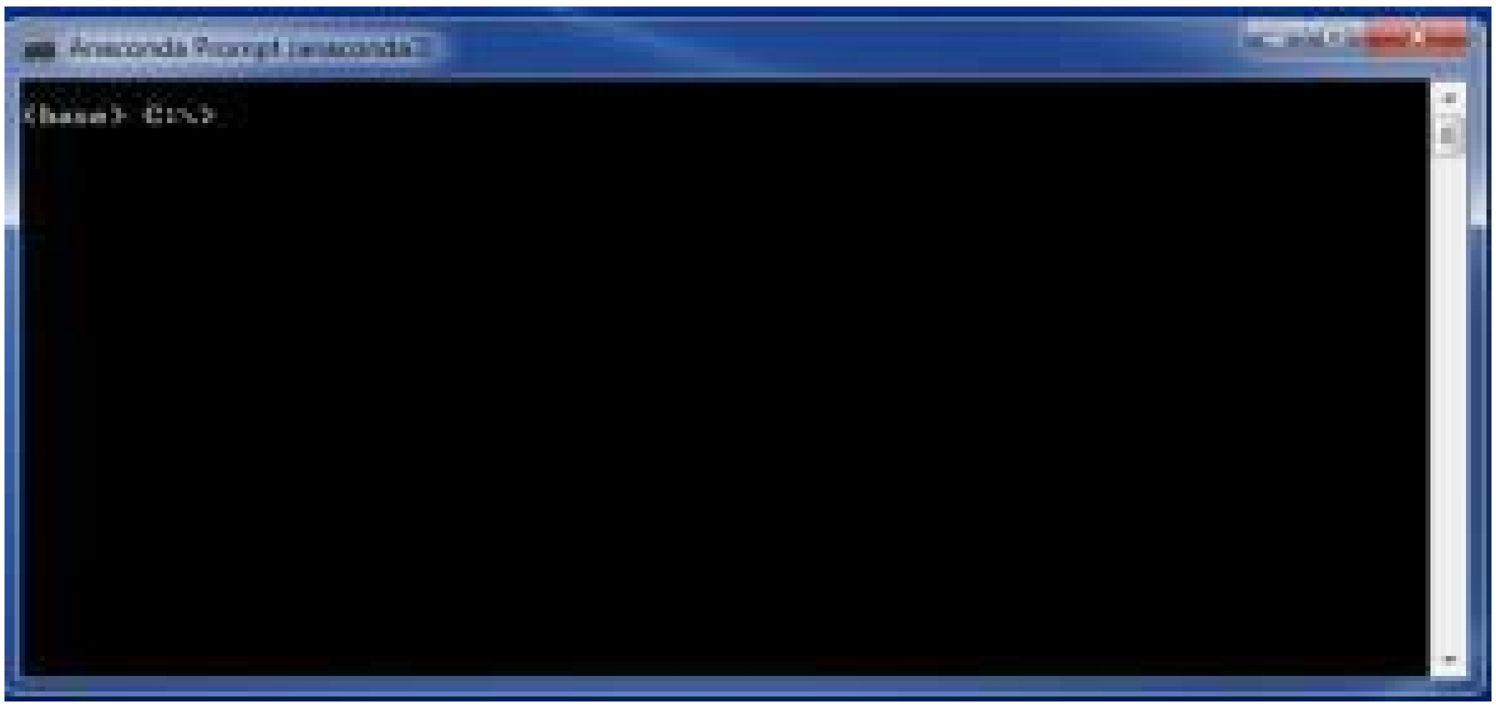
- Create a desktop short-cut
- Access Anaconda command line from the “**Start**” menu “**Programs**” option

- Access Anaconda through the **DOS** command line using **cmd** from the “**Start**” menu **run**/**search** facility.

For the sake of this exercise the “**Start**” menu “**Programs**” option is going to be used.

Go to the “**Start**” menu “**Programs**” and find “**Anaconda3 (xx-bit)**” then open up the folder.

Choose “**Anaconda Prompt (anaconda3).**”

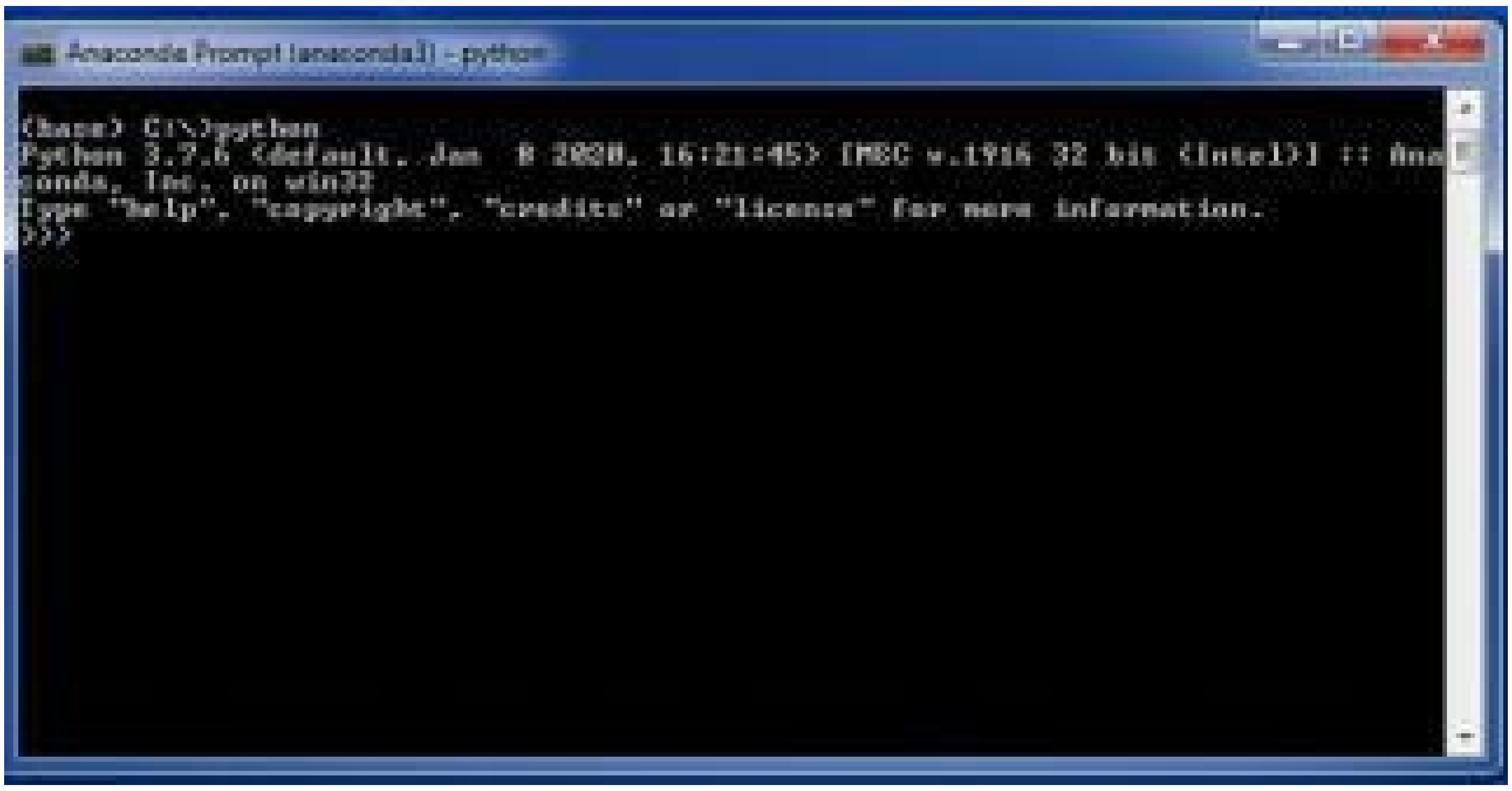


```
(base) C:\>
```

At the command line prompt type:

python

The Anaconda Python command line shell will load and look similar to the screen below.



```
(base) C:\>python
Python 3.7.6 (default, Jan  8 2020, 16:21:45) [MSC v.1916 32 bit (Intel)] :: Ana
conda, Inc. on win32
Type "help", "copyright", "credits" or "license" for more information.
>>>
```

If you want to test the Anaconda installation, import a file called “The Zen of Python” by Tim Peter by typing the following into the command line:

import this

Check that “**conda**” is installed in Anaconda, as it is the package installer for Anaconda.

If you have the **Anaconda Prompt** open and **Python** loaded, first exit the Python command line by typing the following:

exit()

This will take you back to the **Anaconda Prompt** and you can type in the following:

conda --version

This should show the version of conda. At the time of printing this book the latest version was 4.8.3. **Conda.exe** should come preloaded with the newer versions of Anaconda. However, they are not always the latest version of **conda** and may need to be upgraded. If the currently installed version of conda is older than version 4.8.3 then you should upgrade to the latest version.

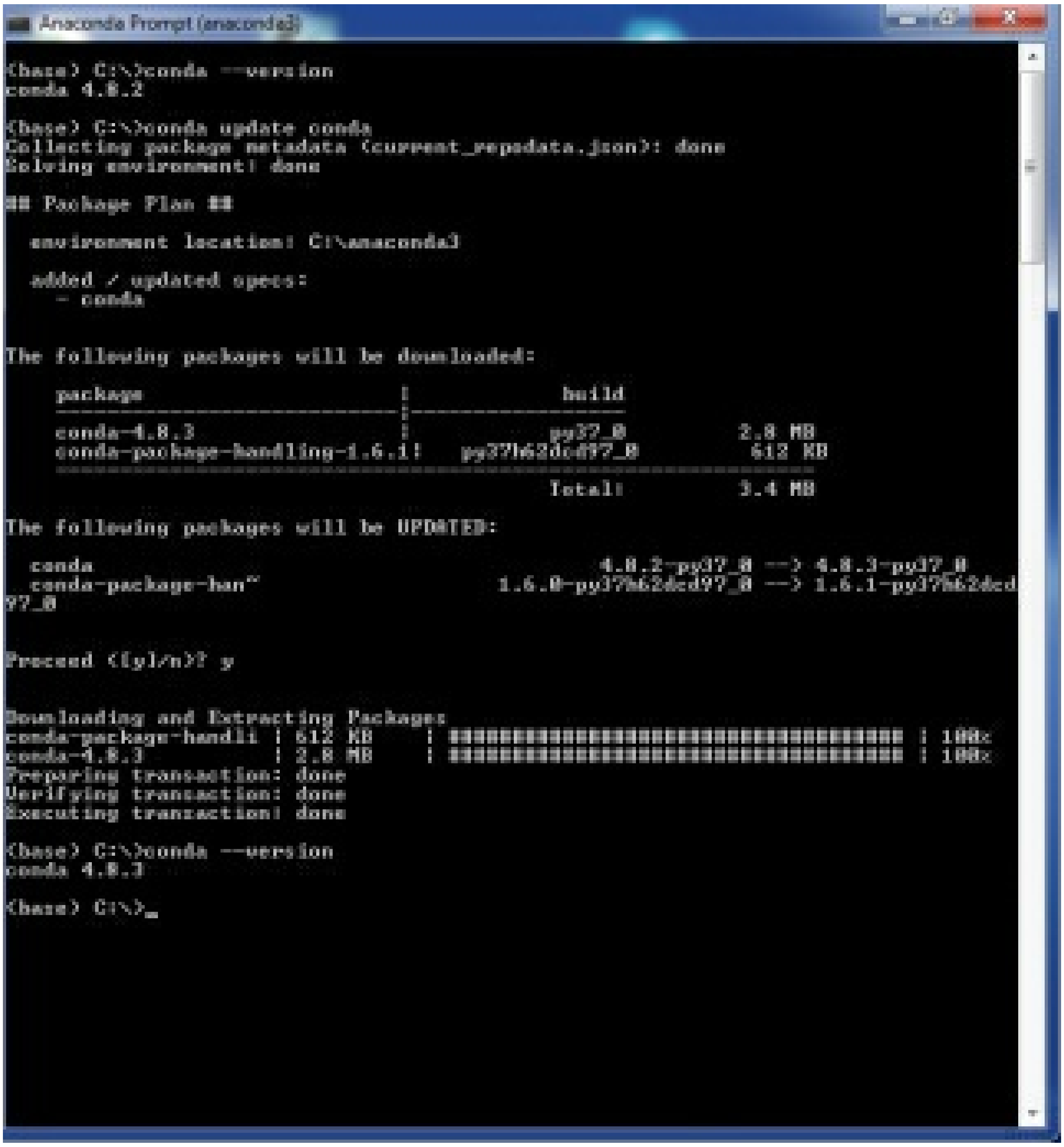
To upgrade **conda,** type the following into the **Anaconda Prompt** command line:

```
conda update conda
```

When the **conda** upgrade is finished type:

```
conda --version
```

The **conda** version should be 4.8.3



```
(base) C:\>conda --version
conda 4.8.2

(base) C:\>conda update conda
Collecting package metadata (current_repodata.json): done
Solving environment: done

## Package Plan ##

  environment location: C:\anaconda3

  added / updated specs:
    - conda


The following packages will be downloaded:

    package                    |            build
    ---------------------------|-----------------
    conda-4.8.3                |           py37_0         2.8 MB
    conda-package-handling-1.6.1|   py37h62dcd97_0         612 KB
    ------------------------------------------------------------
                                           Total:         3.4 MB

The following packages will be UPDATED:

  conda                                    4.8.2-py37_0 --> 4.8.3-py37_0
  conda-package-han~                1.6.0-py37h62dcd97_0 --> 1.6.1-py37h62dcd
97_0


Proceed ([y]/n)? y


Downloading and Extracting Packages
conda-package-handli | 612 KB    | ######################################## | 100%
conda-4.8.3          | 2.8 MB    | ######################################## | 100%
Preparing transaction: done
Verifying transaction: done
Executing transaction: done

(base) C:\>conda --version
conda 4.8.3

(base) C:\>_
```

The Anaconda **conda** utility should now be the latest version.

Install NumPy and SciPy With Conda

To find out if NumPy and SciPy are loaded, type in the following for a full list of loaded modules:

```
conda list
```

Scroll the list to ensure that Numpy and SciPy are loaded. If they are not loaded, you will have to install them by typing in the following at the **Anaconda Prompt**:

- **To download NumPy**

  ```
  conda install numpy
  ```

- **To download SciPy**

  ```
  conda install scipy
  ```

Installing Scikit-Learn

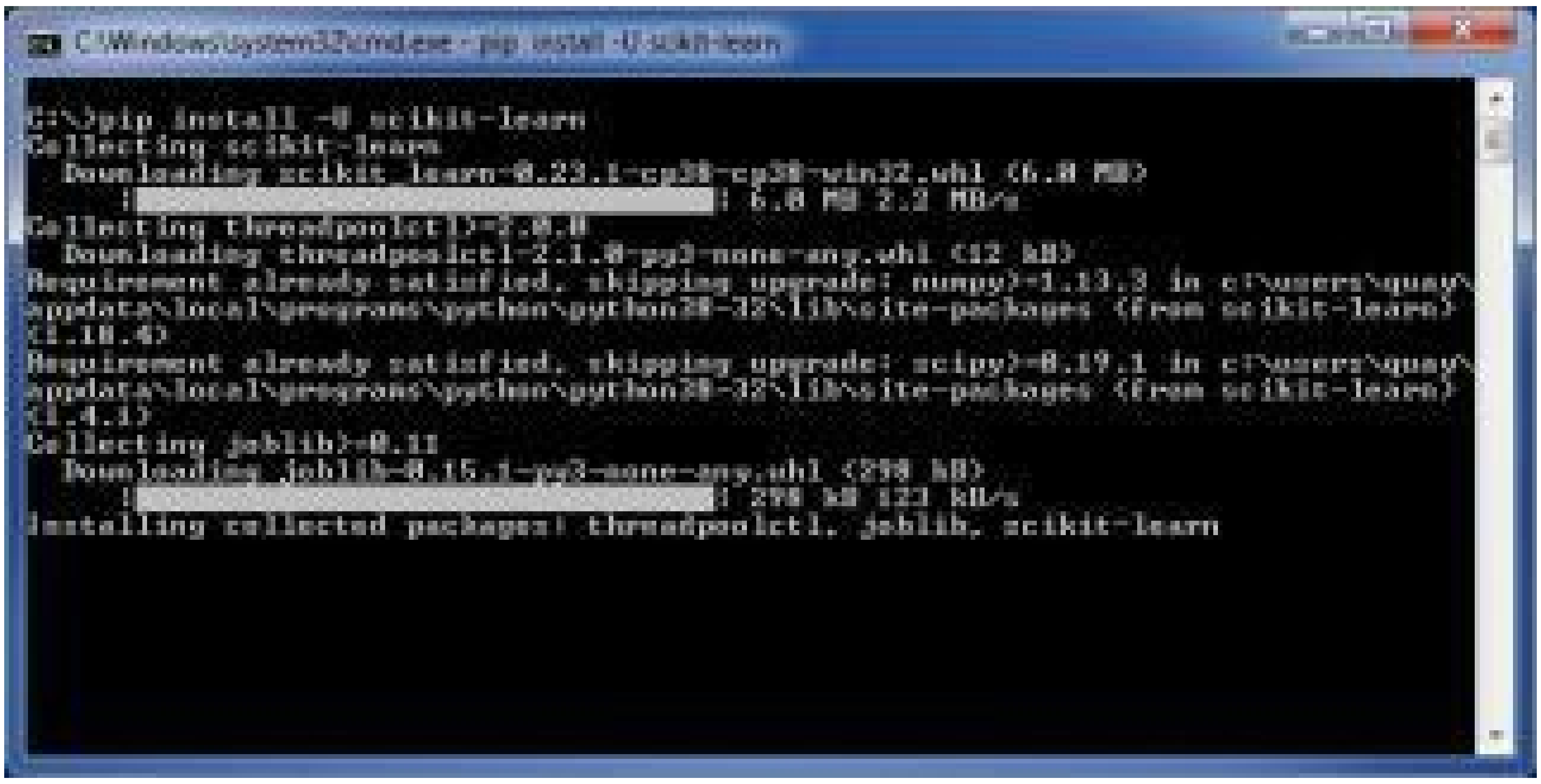
Either Python **pip** or Anaconda **conda** can be used to install Scikit-learn.

Installing Scikit-Learn with Python Pip Without a Virtual Environment

To install Scikit-Learn with Python and ensure it is the latest version that is compatible with your Python installation, open a **cmd** screen and type the following:

```
pip install -U scikit-learn
```

The following screen will appear when installing Scikit-Learn.



```
C:\Windows\system32\cmd.exe - pip install -U scikit-learn

C:\>pip install -U scikit-learn
Collecting scikit-learn
  Downloading scikit_learn-0.23.1-cp38-cp38-win32.whl (6.8 MB)
     |████████████████████████████████| 6.8 MB 2.2 MB/s
Collecting threadpoolctl>=2.0.0
  Downloading threadpoolctl-2.1.0-py3-none-any.whl (12 kB)
Requirement already satisfied, skipping upgrade: numpy>=1.13.3 in c:\users\quay\
appdata\local\programs\python\python38-32\lib\site-packages (from scikit-learn)
(1.18.4)
Requirement already satisfied, skipping upgrade: scipy>=0.19.1 in c:\users\quay\
appdata\local\programs\python\python38-32\lib\site-packages (from scikit-learn)
(1.4.1)
Collecting joblib>=0.11
  Downloading joblib-0.15.1-py3-none-any.whl (298 kB)
     |████████████████████████████████| 298 kB 123 kB/s
Installing collected packages: threadpoolctl, joblib, scikit-learn
```

Allow the installation to run to completion, which could take a few minutes.

Installing Scikit-Learn with Python Pip in a Virtual Environment

If you have an Anaconda installation, it is best to create a different virtual environment to run Scikit-Learn for Python in. To run this from the command line prompt, follow these instructions:

Install the virtual environment for Python:

```
pip install virtualenv
```

Create the virtual environment for Scikit-Learn:

```
python -m venv sklearn-venv
```

Once the environment has been set, type the following into the command line prompt to activate the sklearn-venv environment:

```
sklearn-venv\Scripts\activate
```

Once that script has run, you can then install Scikit-learn with the same commands as used above:

```
pip install -U scikit-learn
```

Allow the package installer to successfully install the library.

Checking the Python Pip Scikit-Learn Installation

To check the Scikit-Learn **pip** installation type the following into the command line once the installation has completed successfully:

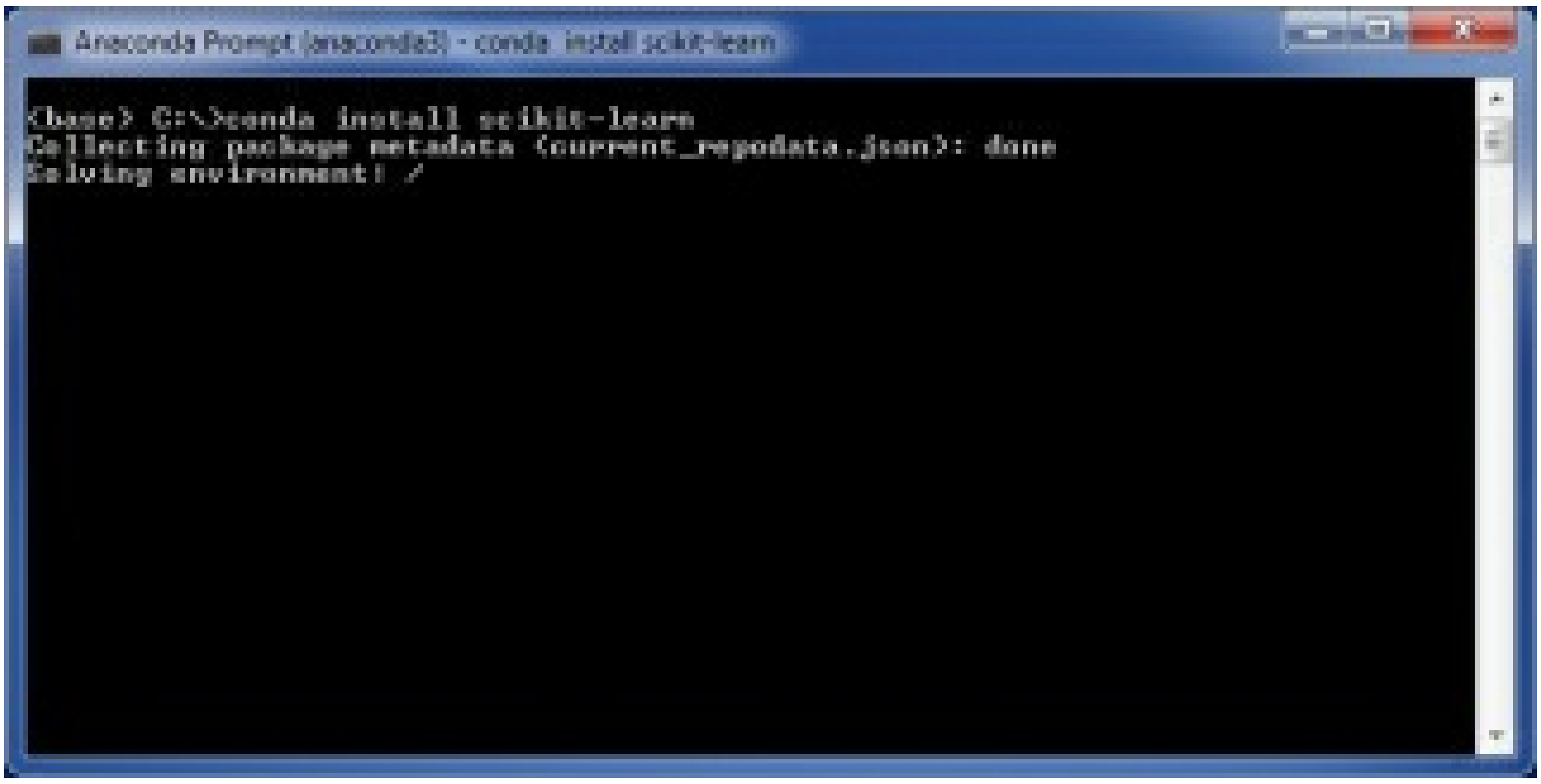
```
python -m pip show scikit-learn
```

This will bring up the version of Scikit-Learn (at the time of writing this book the version was 0.23.1) and where the library was installed.

Installing Scikit-Learn with Anaconda Conda Without a Virtual Environment

To install Scikit-Learn with Anaconda and ensure it is the latest version that is compatible with your Anaconda installation, run the **Anaconda Prompt** and type the following:

```
conda install scikit-learn
```



```
(base) C:\>conda install scikit-learn
Collecting package metadata (current_repodata.json): done
Solving environment: /
```

Allow the installation to complete. This can take several minutes.

Installing Scikit-Learn with Anaconda Conda in a Virtual Environment

If you have a Python environment, then it is best to create an environment to install and run Scikit-Learn for Anaconda that will not interfere with your Python installations.

To create a SciKit Learn environment from the **Anaconda Prompt,** do the following:

```
conda create -n sklearn-env
```

The next step is to activate the environment by typing the following into the **Anaconda Prompt**:

```
activate sklearn-env
```

Next, install Scikit-Learn into the Anaconda virtual environment. At the **Anaconda Prompt**, type the following:

```
conda install scikit-learn
```

Allow the installation to run through to completion.

Checking the Anaconda Conda Scikit-Learn Installation

To check the Scikit-Learn **conda** installation, type the following into the command line once the installation has completed successfully:

```
conda list scikit-learn
```

This will bring up the version of Scikit-Learn (at the time of writing this book the version was 0.21.1) and where the library was installed.

Installing TensorFlow

TensorFlow is a framework that is required for deep learning. It comes with a myriad of functionalities that allow a system to carry out deep learning functions. TensorFlow also has APIs that allow for the interaction between nearly all the most popular programming languages. The programming languages include Rust, Haskell, Java, C++, and Go.

As with most Python or Python compatible libraries, TensorFlow is free to download and use from the Internet as it is open source software. TensorFlow can be installed using either Python **pip** or Anaconda **conda** package installation programs. For the sake of this book the CPU-only version of TensorFlow is to be installed.

Installing TensorFlow With Python Pip Without a Virtual Environment

To install TensorFlow with Python and ensure it is the latest version that is compatible with your Python installation, open a **cmd** screen and type the following:

```
pip install -U tensorflow
```

The above command will help you install the **CPU** only version for TensorFlow. The **CPU** version of TensorFlow is faster and is a much easier system for beginners to work with. It is also recommended for the simpler machine learning models. When you are first starting out with machine learning model's, **CPU** is a lot easier to work with to design and train these types of models.

If you need to install a **GPU** version for TensorFlow, type the following command into the **cmd** command line:

```
pip install -U tensorflow-gpu
```

This will install the TensorFlow **GPU** version for your Windows system. **GPU** is a more advanced modelling system of TensorFlow and is used for huge amounts of data and graphics/images. It is also used to work with more complex tasks than **CPU** and can be quite a bit slower than **CPU**.

Installing TensorFlow With Python Pip with a Virtual Environment

If you created the sklearn-venv environment when you installed Scikit-Learn, then you should install TensorFlow into that environment. You can activate that environment by typing in the following at the **cmd** prompt:

```
sklearn-venv\Scripts\activate
```

Follow the same installation process for installing Scikit-Learn as you would when you are installing it without the virtual environment.

Installing TensorFlow With Anaconda Conda Without a Virtual Environment

To install TensorFlow with Anaconda and ensure it is the latest version that is compatible with your Anaconda installation, open the **Anaconda Prompt** screen and type the following:

```
conda install tensorflow
```

The above command will help you install the **CPU** only version for TensorFlow.

If you need to install a **GPU** version for TensorFlow, type the following command into the **Anaconda Prompt** command line:

```
conda install tensorflow-gpu
```

This will install the TensorFlow **GPU** version for your Windows system.

Installing TensorFlow With Anaconda Conda With a Virtual Environment

If you have already created a conda virtual environment for Scikit-Learn, then use the same environment. If you have not, follow the same procedure to create an Anaconda environment as shown in the "**Installing Scikit-Learn in Anaconda with a Virtual Environment**." Once you have the Anaconda virtual environment, activate it using the following command:

```
activate sklearn-env
```

Install TensorFlow by typing in:

```
conda install tensorflow
```

This will install the TensorFlow CPU version for your Windows system.