Python and Eclipse Setup

MOTIVATION

Python is a powerful and widely accepted (and free/open source) programming language that can effectively do the same things as other programming languages you may have heard of (Matlab, C, C++, Fortran, etc.). While you can learn similar programming skills using most languages, we will be using Python (specifically, Python 3) in this course, with a focus on solving nuclear engineering related problems.

While there are many code editors and integrated development environments (IDEs), which contain a code editor and other handy tools, in this course you will be introduced to Eclipse. If you are already familiar with a different software (e.g., Atom, Spyder, etc.), feel free to use what you are comfortable with, otherwise, I recommend that you download and install Eclipse following the guide below as soon as possible.

Note: as of yet, the public computers at the various UNB libraries do not have Python or Eclipse installed. If you do not have access to a personal computer, there are virtual online coding environments that we can set you up with. While these won't be exactly the same experience as using Eclipse, you will still be able to complete all assigned tasks for this course. Please contact me ASAP at opalazhc@unb.ca if you require this accommodation.

GENERAL NOMENCLATURE

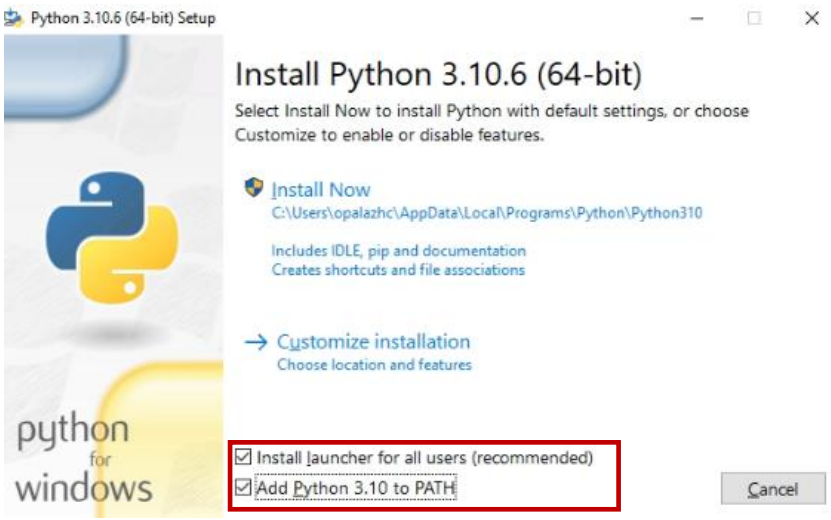
Term	Definition
Integrated Development Environment (IDE)	Comprehensive software suite that consolidates basic tools needed for developers. A typical IDE includes a source code editor, libraries, a compiler, and a debugger.
Source code, or code	Fundamental part of a computer program. Source code is a text listing of commands written in a high-level language that is converted into object code or machine code by a compiler.
Code editor	Text edit area that allows developers to write, edit and save a document with code. It has features that assist with the writing and editing of code. E.g., Code completion: as you start to type the name of a variable, the code editor suggests or completes the name (autocomplete).
Libraries	Provide functions that are not included in the core part of the programming language. These functions can be imported and used at the start of the program code.

PYTHON DOWNLOAD AND INSTALL INSTRUCTIONS

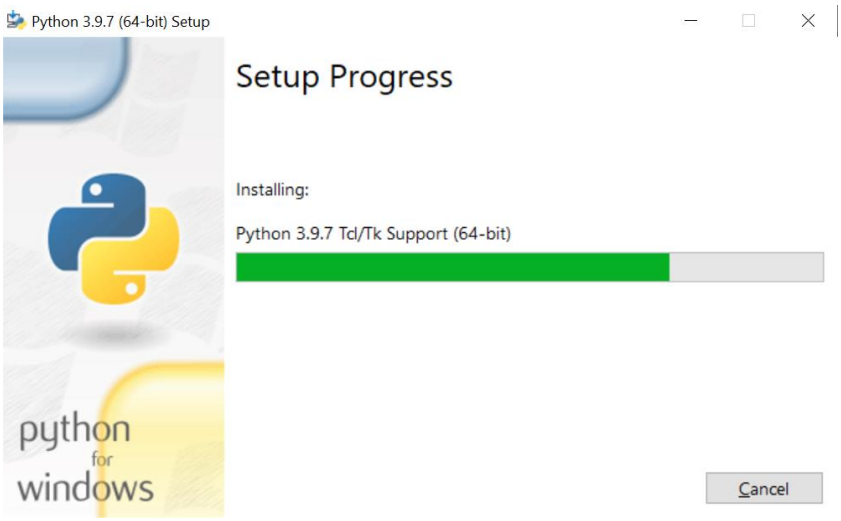
Notes: Install Python before installing Eclipse (do not skip to next section!)

This document shows downloading and installing Python 3.10.6 on Windows 10 in Fall 2022. **Download and install the latest version of Python.** The current latest version is Python 3.10.6.

1. Click Python Download.
2. Click the **Download Python 3.10.6** button
3. Click the **Save File** button
4. The file named **python-3.10.6-amd64.exe** should start downloading into your standard download folder.
5. Double-click the **python-3.10.6-amd64.exe** file to begin the installation
6. Ensure that **both** the **Install launcher for all users (recommended)** and the **Add Python 3.10 to PATH** checkboxes at the bottom are checked
   - Only first is checked by default. Check the second box too (shown below).

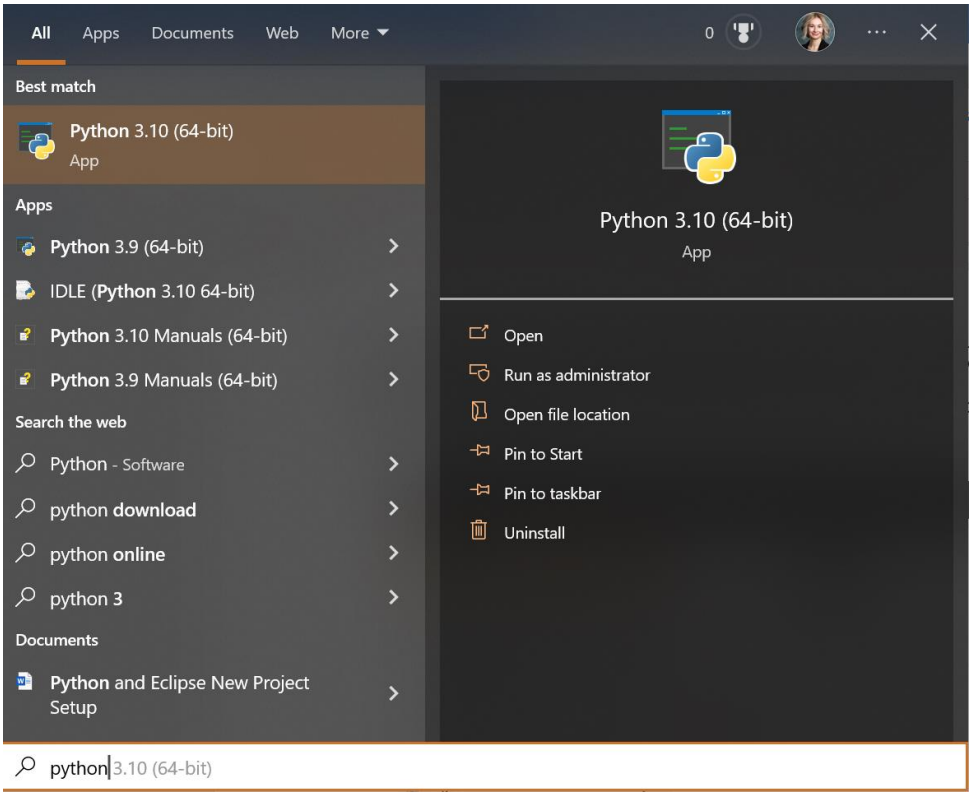


7. Select **Install Now** (first option from the screenshot above)
8. If asked, select **yes** to allow the app to make changes to your device. The following progress bar should appear:



9. A **Setup Successful** pop-up should appear. Click close.

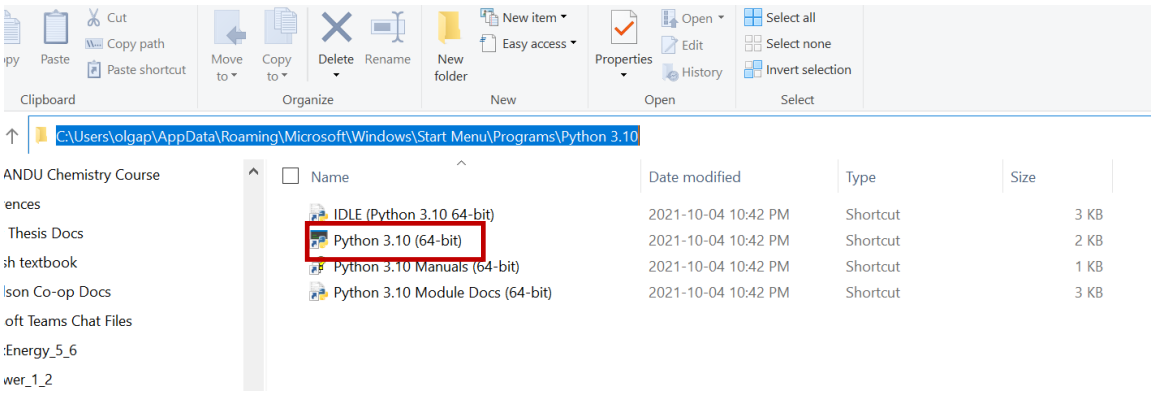
10. Check that Python 3 was installed correctly by finding it on your computer. You can search for it on your computer using the Windows search bar (shown below) and click on the **Python 3.10 App**.



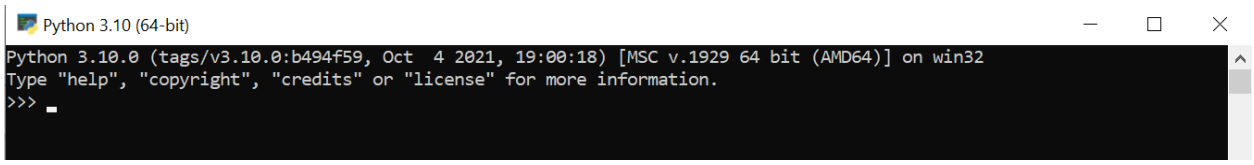
If finding the location of the python.exe file using the above method does not work, Python was likely installed to:

C:\Users**YourUserName**\AppData\Roaming\Microsoft\Windows\Start Menu\Programs\Python 3.10

Locate it by pasting the above location url into any folder navigation bar and open (double-click) the **python.exe** file (shown in the red box).



11. Either method should result in the following pop-up:



12. Close the command line pop-up.

Congratulation! You have now successfully installed Python and verified the install.

You can now move onto the next step and install the Eclipse IDE.

ECLIPSE NOMENCLATURE

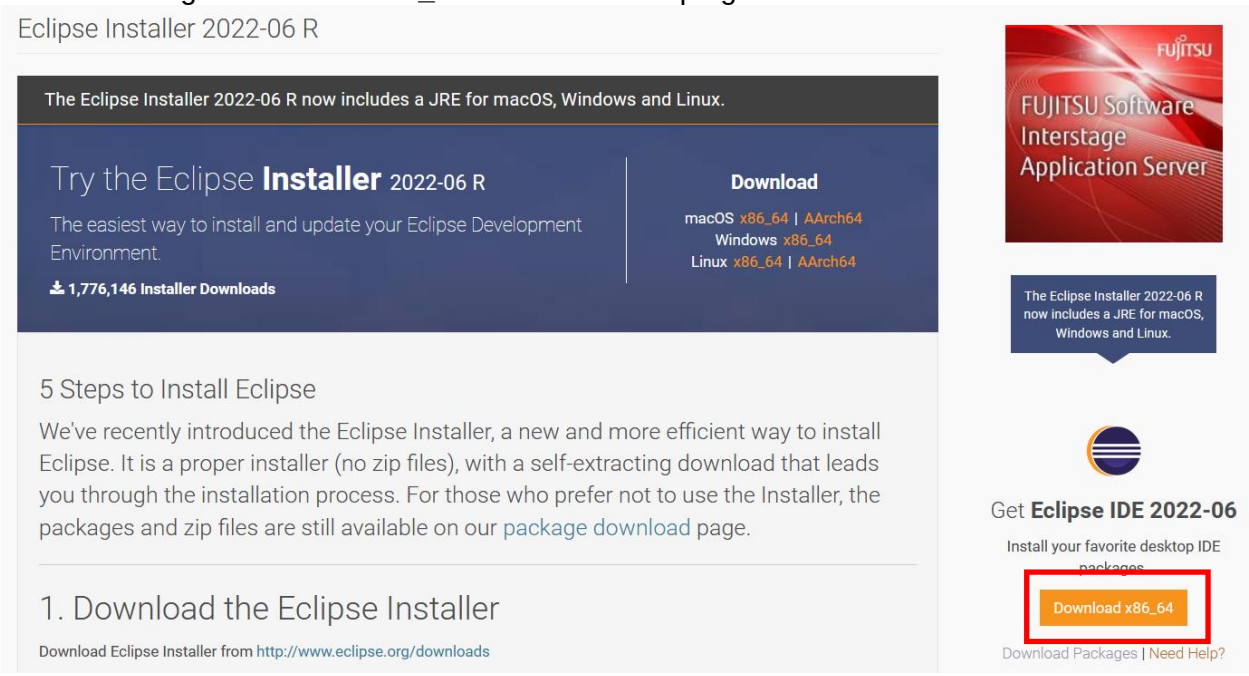
Term	Definition
Workspace	Folder that contains collection of files/subfolders that store the workspace's preferences (how workbench window appears on your screen and how it displays/manipulates it contents) and projects (Python modules and other files).
Workbench window	We interact with a workspace view and manipulate its preferences and projects through a workbench window.
PyDev Perspective	At any given time, Eclipse displays one **perspective**. Each different perspective is suited to a specific programming task. E.g., the PyDev perspective is used to develop Python modules (write/run/edit them).

ECLIPSE DOWNLOAD AND INSTALL

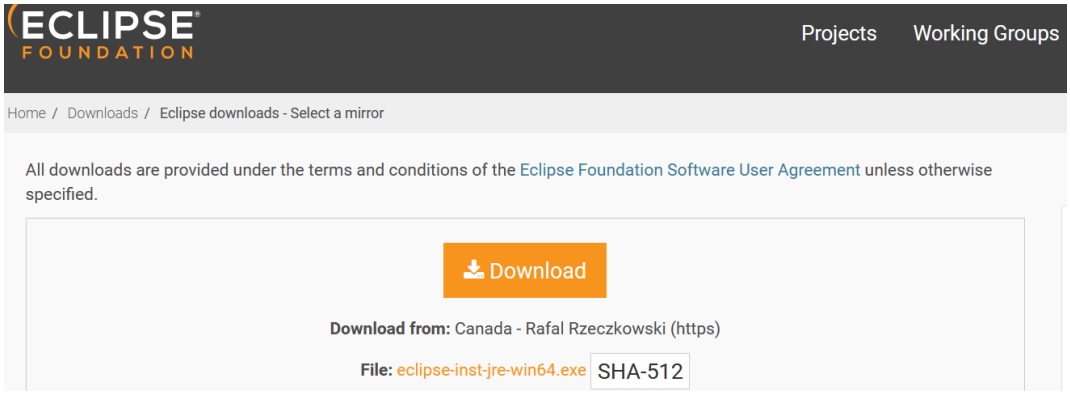
Notes: You must have installed Python as a 64-bit application (if you used a different method to download/install than the guide outlined in this document). Eclipse can be installed only as a 64-bit application.

1. Click Eclipse
   If you use Windows, continue below; otherwise choose either **Mac OS X** or **Linux** instead.

2. Click the orange **Download x86_64** button on the top right-hand side.



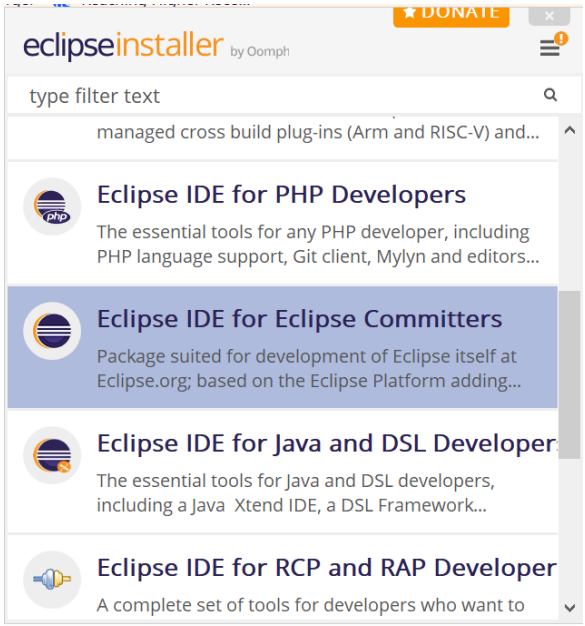
3. You will see the following page (don't worry about the name under the orange **Download** button, this is a legitimate download).



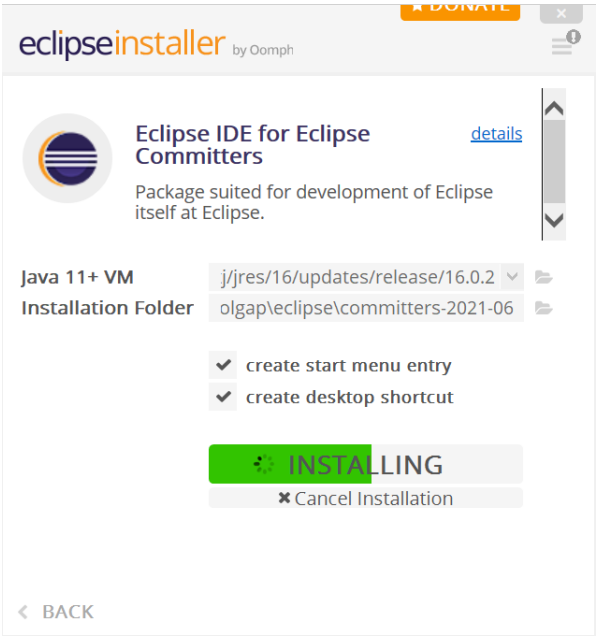
4. Click the **Save File** button when the **eclipse-inst-jre-win64.exe** pop-up appears.

5. Find the .exe file in your downloads folder and double-click to start the installation.

6. The following pop-up will appear. Scroll down to **Eclipse IDE for Eclipse Committers** and select this.



7. Click **Install** at the next pop-up. If prompted, click **Accept Now** on the **Eclipse Foundation Software User Agreement**. You will then see the installation progress bar. This will take anywhere between 5-10 minutes.



8. Once the installation is complete, click **Accept** on the license agreement pop-up, and then click the green **Launch** button that replaces the **Installing** bar.

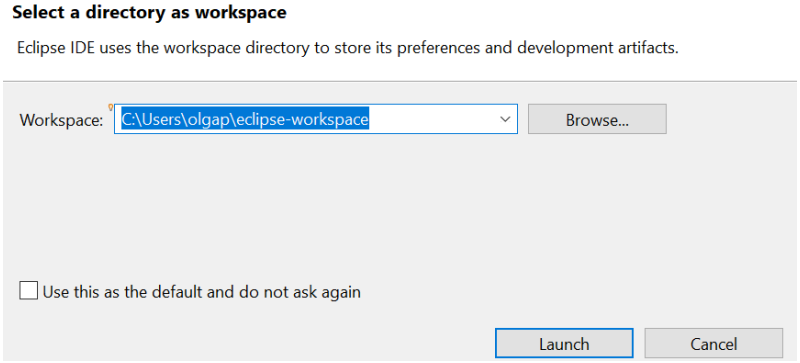
9. The installer will create a shortcut (the "death-star" icon)  on your desktop to the eclipse.exe file in the folder Eclipse was installed to. After this installation, the Eclipse Installer will automatically start the software for you.

   Every other time after this, you will double-click this icon to start Eclipse.

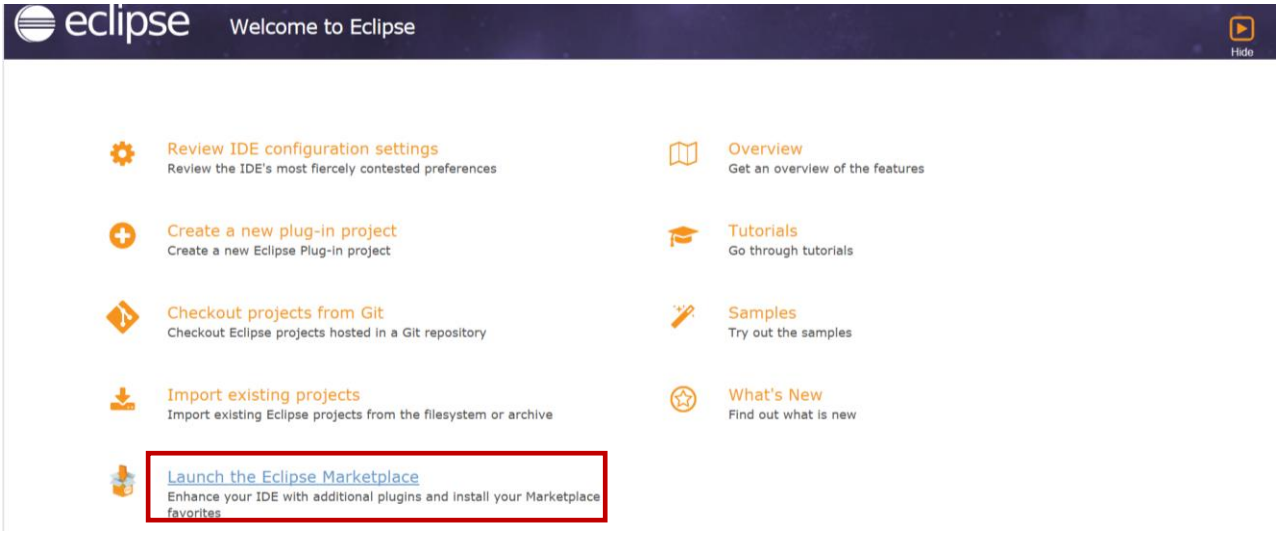
10. After a few seconds of the Eclipse Banner, the Eclipse Launcher pop-up window will appear.

11. In the Workspace text box, your name should appear between C:\Users\ and \eclipse-workspace, instead of olgap.

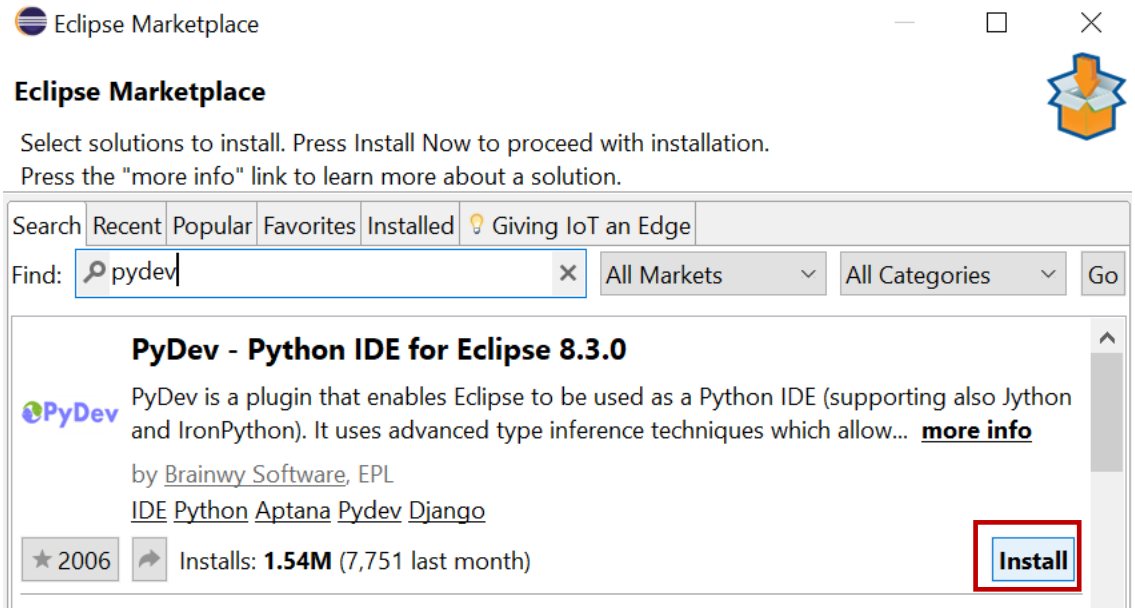
12. Do <u>not</u> check the **Use this as the default and do not ask again** box. For first-time users, it is best to see this Workspace Launcher pop-up window each time you start Eclipse, to remind you where the workspace is located on your computer.



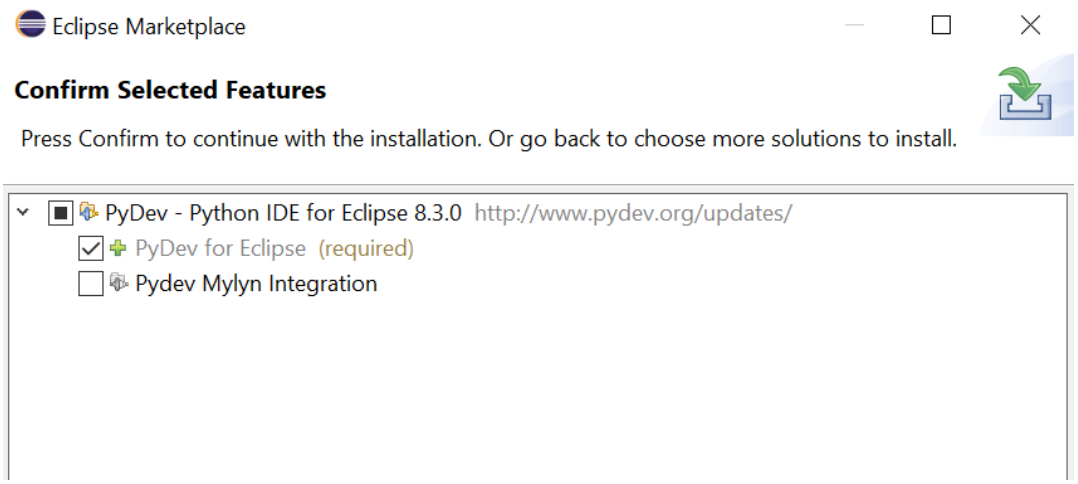
13. An Eclipse start progress bar will appear. After ~30 seconds - 1 minute, an Eclipse welcome screen will appear. Click **Launch the Eclipse Marketplace**.



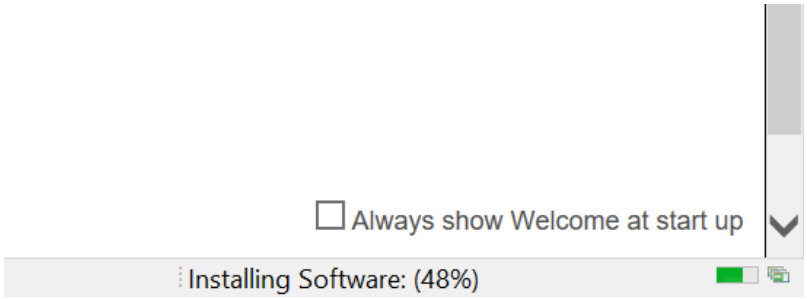
14. Type **Pydev** in the search bar and click **Enter**. Click **Install** under the **Pydev - Python IDE for Eclipse 8.3.0** (or whatever the latest version is).



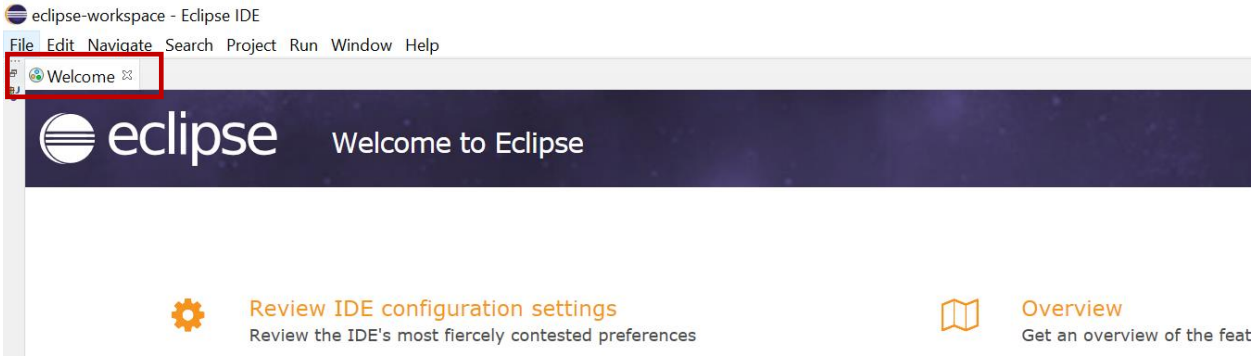
15. Select only the top **PyDev for Eclipse (required)** checkbox (generally, already pre-selected). Do NOT select the **PyDev Mylyn Integration (optional)** box. Click **Confirm**.



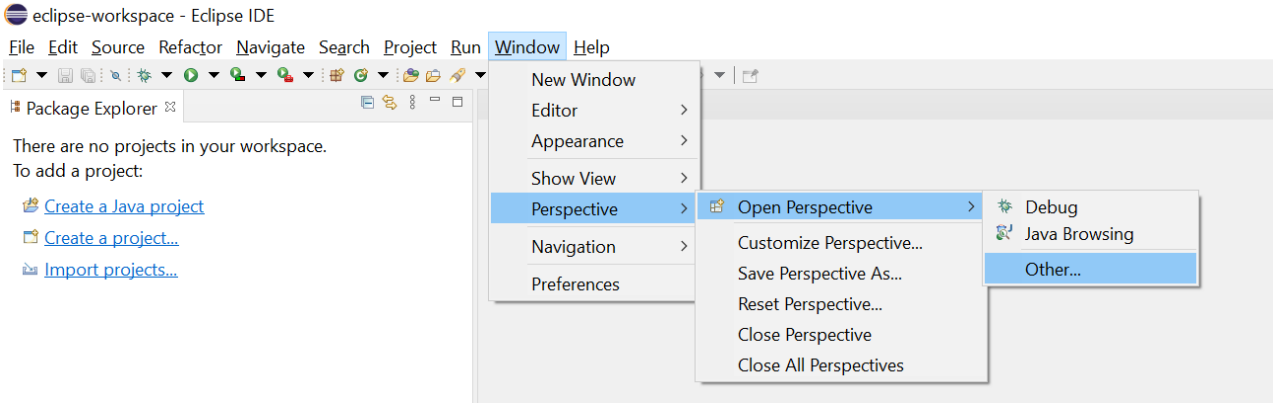
16. Select the **I accept the terms of the license agreement** bubble and click **Finish**. You will be taken back to the welcome window, but a green progress bar will appear in the bottom right of the screen.



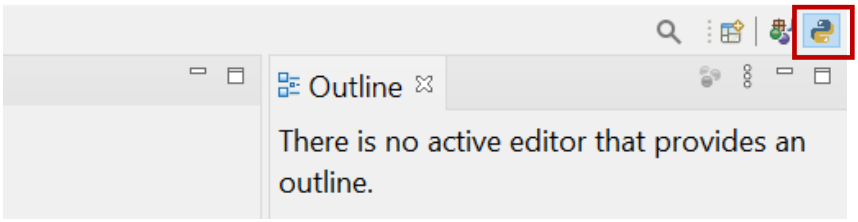
17. Click **Restart now** (this will re-start Eclipse, not your computer). Upon restart, you will be taken back to the welcome launch screen from Step 13. Exit this by clicking the “X” in front of the Welcome tab on the top left corner of the screen (under File and Edit on the task bar).

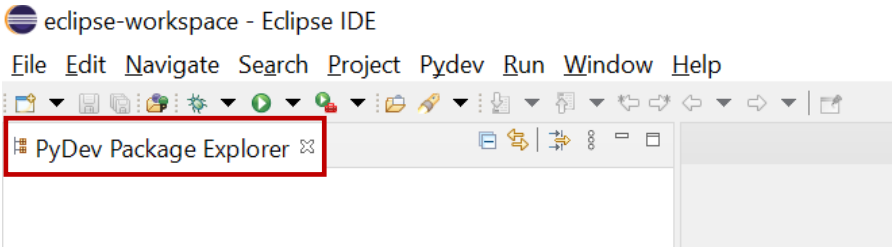


18. By default, your perspective will be set to Java. We need to tell Eclipse that we will be using it to work on Python projects. Select **Window** from the task ribbon at the top of the page, then select the **Perspective** drop-down menu, followed by **Open Perspective** and then **Other**.



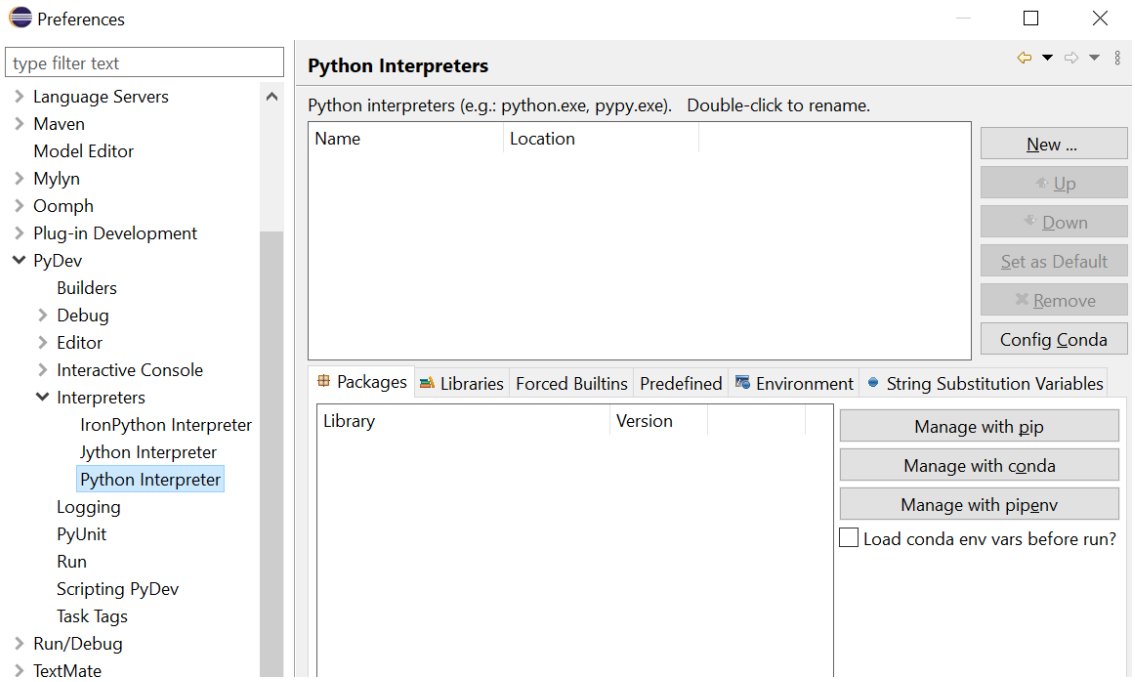
19. Click on the "double-snake" Python icon labelled **PyDev**. The Eclipse workbench will now be in Python development (PyDev) mode. You can tell this by the double snake icon that now appears and is depressed in the top right corner of the page. The Package Explorer view (typically on the left-hand side of the screen) will also say **PyDev Package Explorer**.



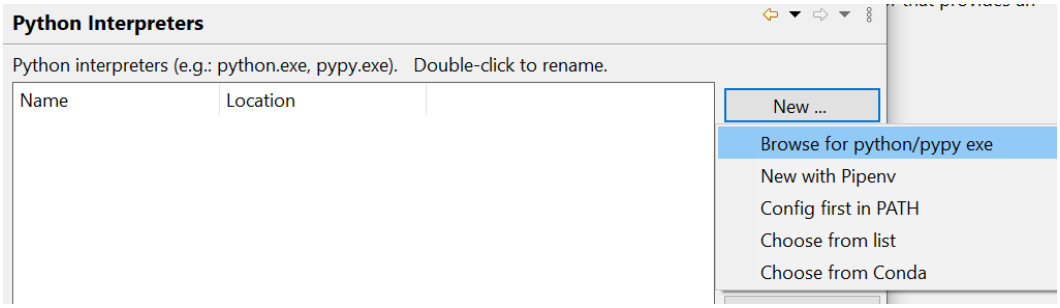


20. Right click on the J icon to the left of the PyDev icon on the top right corner of the page and click **Close**.

21. Go to **Window** from the task bar ribbon once again, and this time select **Preferences**. On the left-hand side menu, click the > beside PyDev, followed by clicking the > beside Interpreters, and finally click on **Python Interpreter**. We will now tell Eclipse where your Python download from steps 1-12 lives on your computer.

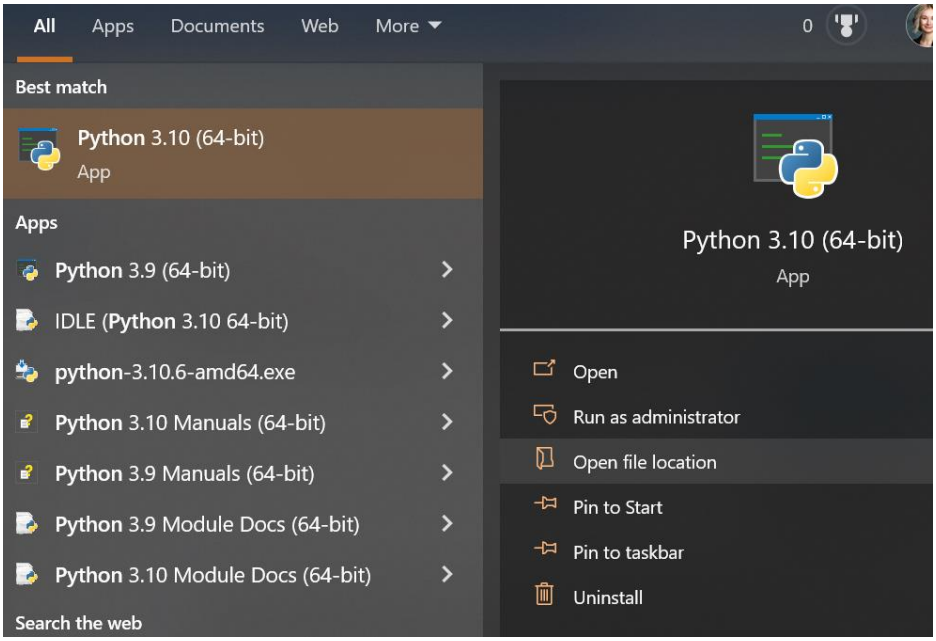


22. Click **New** in the top right area, located beside the Python Interpreters box and then click **Browse for python/pypy.exe**.

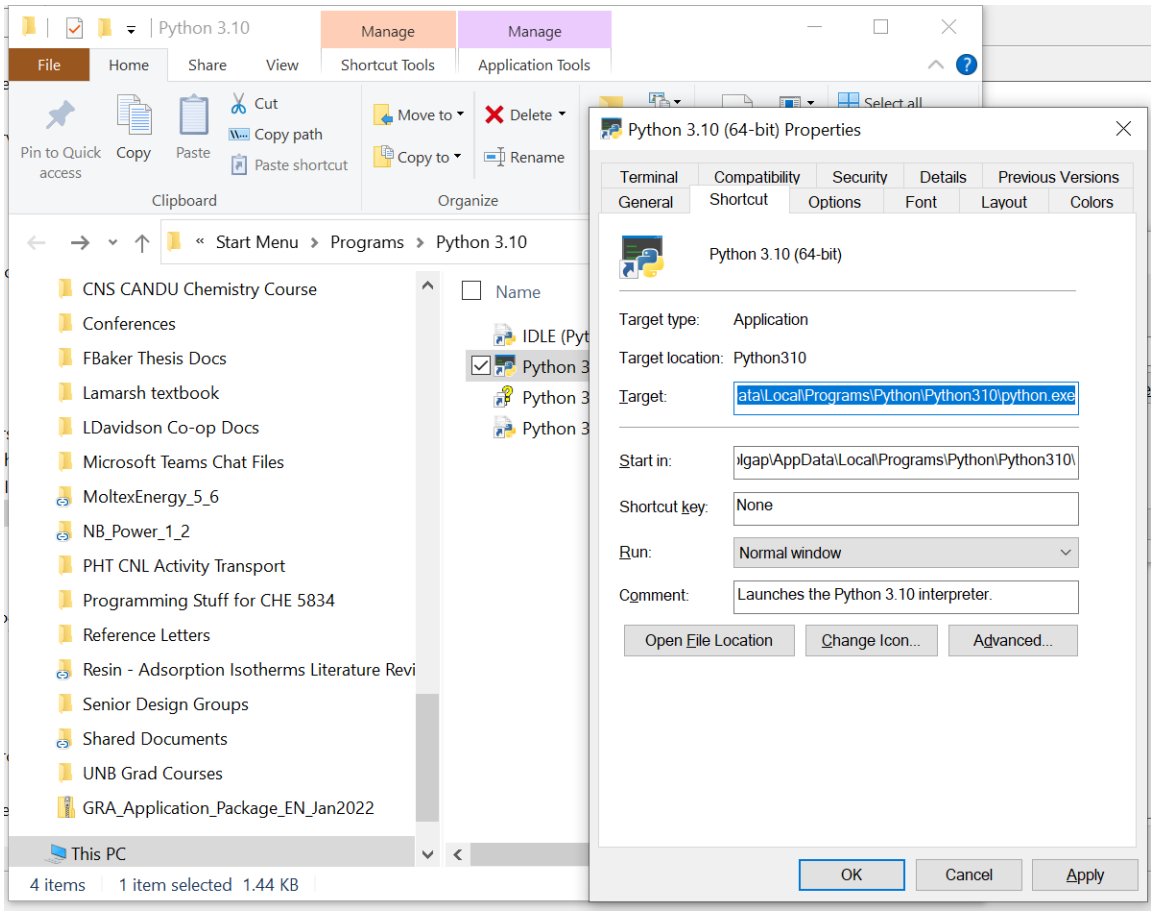


23. A file browser pop-up will appear. Click **Cancel** (unless you know the location of your Python install off the top of your head and can manually navigate there).

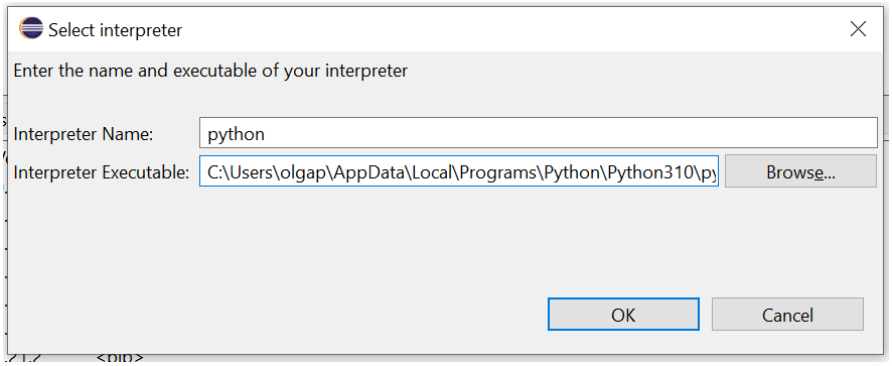
    Repeat the instructions in step 10 of the Python install in this document (page 3) to find where Python has been installed on your PC using the Windows search function. This time right click on the **Python 3.10 App** and select **Open file location** or click on **Open file location** on the right-hand-side.



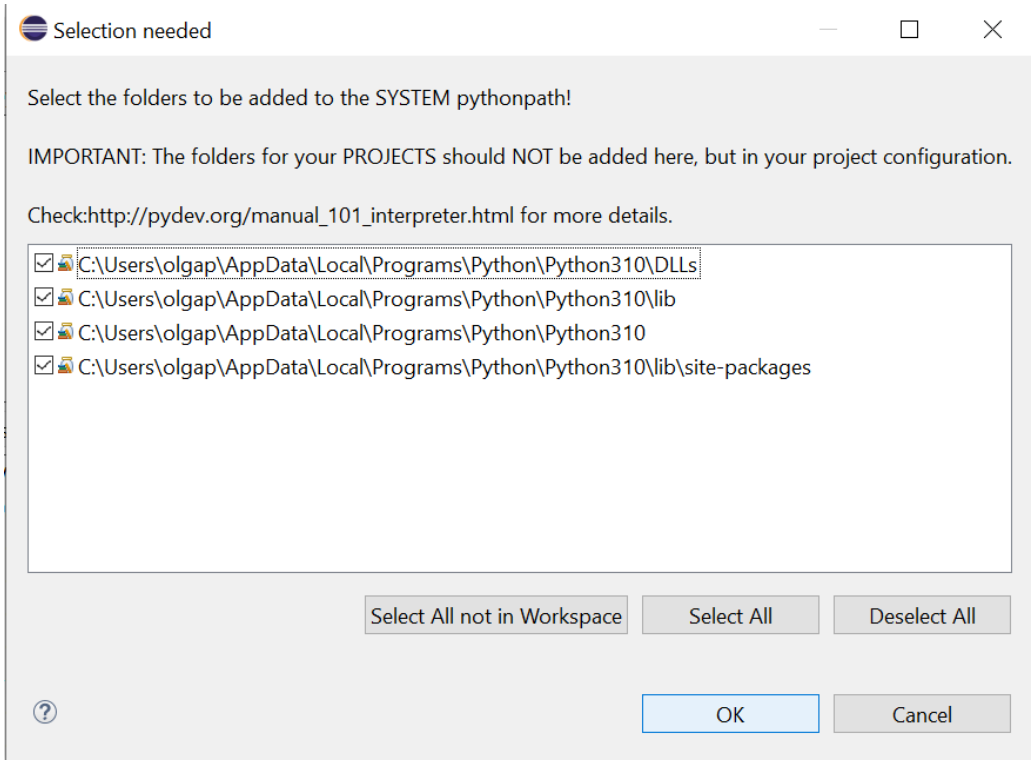
Once the Python folder has opened, right click on the .exe file, select **Properties**, and copy (e.g., ctrl+c) the file location from the **Target** box.



Back in Eclipse, paste the location link you just copied into the **Interpreter Executable** box Type python into the **Interpreter Name** box.



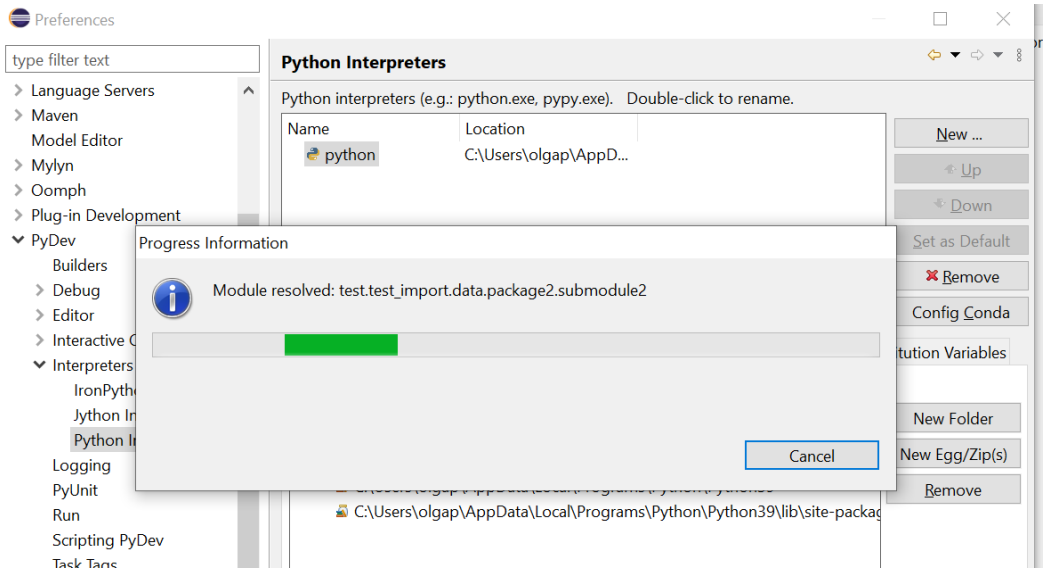
24. Click **OK** and then click **OK** again. Do not unselect any of the folder names that appear.



25. You will be returned to the screen from step 21. Select the **Libraries** tab (under the **Python Interpreters** box, beside the **Packages** tab.

    When we installed Python it came with a series of scientific packages and tools (equation solvers, graph plotting packages, etc.) We are now telling Eclipse that we would like to use these as we begin to develop our Python codes.

26. Click **Apply and Close**. Eclipse will import these into our workspace.This may take a few seconds. Click **Allow Access** if prompted by the firewall.



27. Exit Eclipse by clicking the 'X' in the top right-hand corner of the window. You will get a message that Eclipse is saving your workspace.

Congratulations, you made it! Eclipse is now installed for Python. It can be activated by click the Eclipse shortcut icon which should appear on your desktop. You will later learn how to make your first python module and write your first script for this course!

COMMON ISSUES TRIAGE

1. **"I have a Mac."**

   While this guide is for a Windows operating system, Python + Eclipse can also be installed on Mac PCs. If you have a Mac, email us (opalazhc@unb.ca or bloder@unb.ca), and we'll do our best to set you up. If we can't help, we'll send you to the ITS help desk, first floor of the Harriet Irving Library (back left corner, past the circulation desk). The ITS team is very willing to help you (this is true for non-Mac users as well!).

2. **"I installed Eclipse, but it won't open"**

   This is likely a Java issue. Eclipse requires a Java Runtime Environment or Java Development Kit (JRE or JDK). This is a little confusing, as we're not writing code in Java, but you need the latest JRE to use Eclipse. Sometimes, an old version on your PC is not replaced by the new one from the download and will need to be manually deleted. You can try Control Panel > Programs on your PC, delete Java, uninstalling Eclipse, and complete the Eclipse install again. If this doesn't work, try the ITS help desk (see above).

REFERENCES:

This guide loosely follows the one provided here, particularly for the Python installation:
R. E. Pattis, *Python Download and Installation Instructions*, Accessed August 2021,
url: https://www.ics.uci.edu/~pattis/common/handouts/pythoneclipsejava/python.html