AI Summer School pre-worksheet

Prerequisites:

Users able to install and run programs on their operating system.

Users understanding file management on their operating system.

Worksheet introduction:

This worksheet should be completed before the commencement of the AI Summer School (please aim to do it in advance so we can assist if there are any problems). It should not take you long, if you have used Python to any standard before this should be straightforward. Completing this worksheet is crucial to minimize setup time and maximize your learning experience. If you encounter difficulties with the installation steps, it is essential you reach to us for help contact (jas140@aber.ac.uk). Please give this worksheet your full attention and follow the instructions carefully.

Why Python?

Upon completing this course, Python will emerge as an additional toolset to enhance your research capabilities. You will gain the ability to analyse data you have collected from experiments. You will be encouraged to do so in a repeatable, scalable, and sophisticated manner. Python will support you to work with large datasets with complex machine learning algorithms. By learning Python, you will join a vast online scientific community where you can seek support and find possible collaborations.

Section 1- Installing Anaconda and Spyder (Windows, Linux & Mac):

Note 1: If you've previously installed Anaconda and Spyder before this course, you can bypass this section.

Note 2: We will be using Spyder for this course as it is installed on all university computers. While there are alternative options available, Spyder is widely regarded as an excellent choice due to its large suite of features and user-friendly interface. If you are already using an alternative, you are welcome to continue using it; however, we recommend using Spyder as we cannot guarantee full support for alternatives during this course.

Firstly, we need to ensure that your personal system is set up correctly. Please click on the link below or copy and paste it into your browser. Follow the instructions on the page to install Anaconda Navigator. Note that there are separate instructions for each operating system (OS). Choose the instructions that correspond to your machine's OS.

https://docs.anaconda.com/free/anaconda/install/index.html

Anaconda is a popular open-source distribution of Python, primarily used for data science and machine learning tasks. It bundles together numerous libraries and tools essential for data analysis, such as

NumPy, Pandas, Matplotlib, and scikit-learn, among others. It's widely favored by data scientists and researchers due to its ease of use and comprehensive suite of tools tailored for data-related tasks.

If everything has gone smoothly you should now be able to open Anaconda and be presented with a screen that looks something similar (dependant on your OS) to the image you see below. If that checks out, you can move on to section 2.
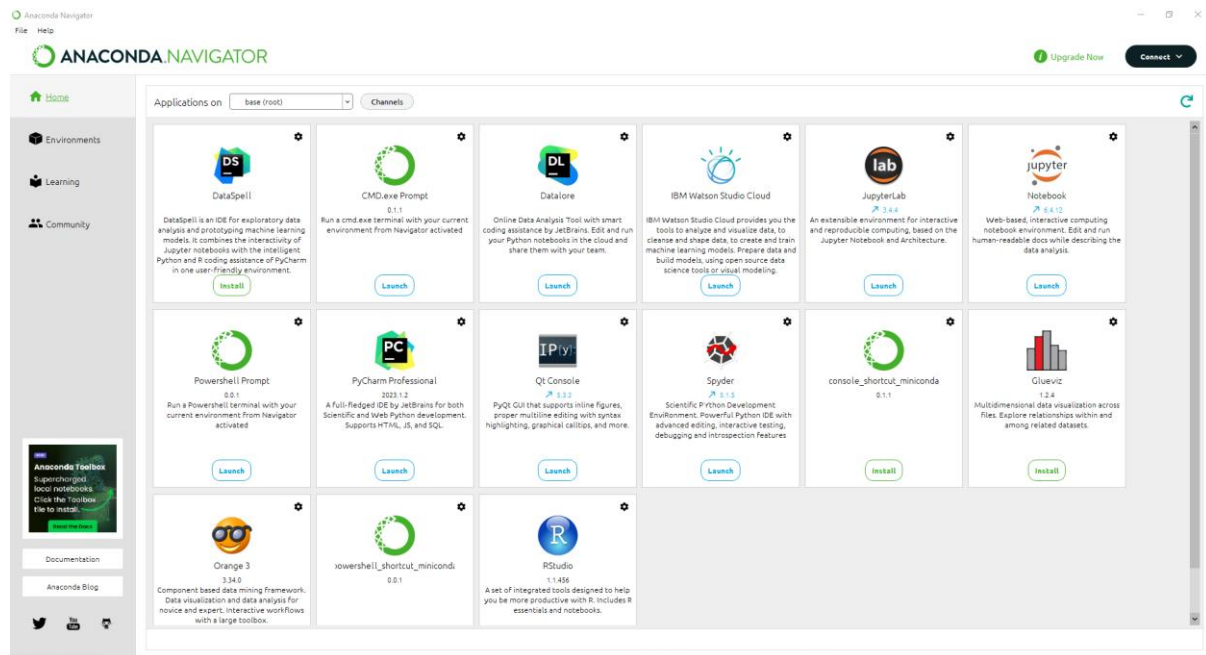

Section 2 – Creating an environment and installing Spyder:

Creating an environment for each project is the best practice for managing your Python projects. Often the dependencies you need to build your software can have complicated interactions where they rely on specific versions. Environments allow you to isolate versions for that specific project. Environments make your projects easier to reproduce, collaborate and deploy because they can be exported to ensure the conditions are maintained.

Creating an environment

Click on the environments tab and then click on 'create'. Name the environment 'preworksheet' and choose the latest version of Python. You may have to wait while the environment is created.

Now go back to the home menu and install Spyder by pressing the install button underneath its icon. Spyder will need to be installed on each environment you create. Once it has installed go ahead and open Spyder. If everything has gone smoothly you should now be presented with a screen that looks something similar (dependant on your OS) to the image you see below. If that checks out, you can move on to section 3.
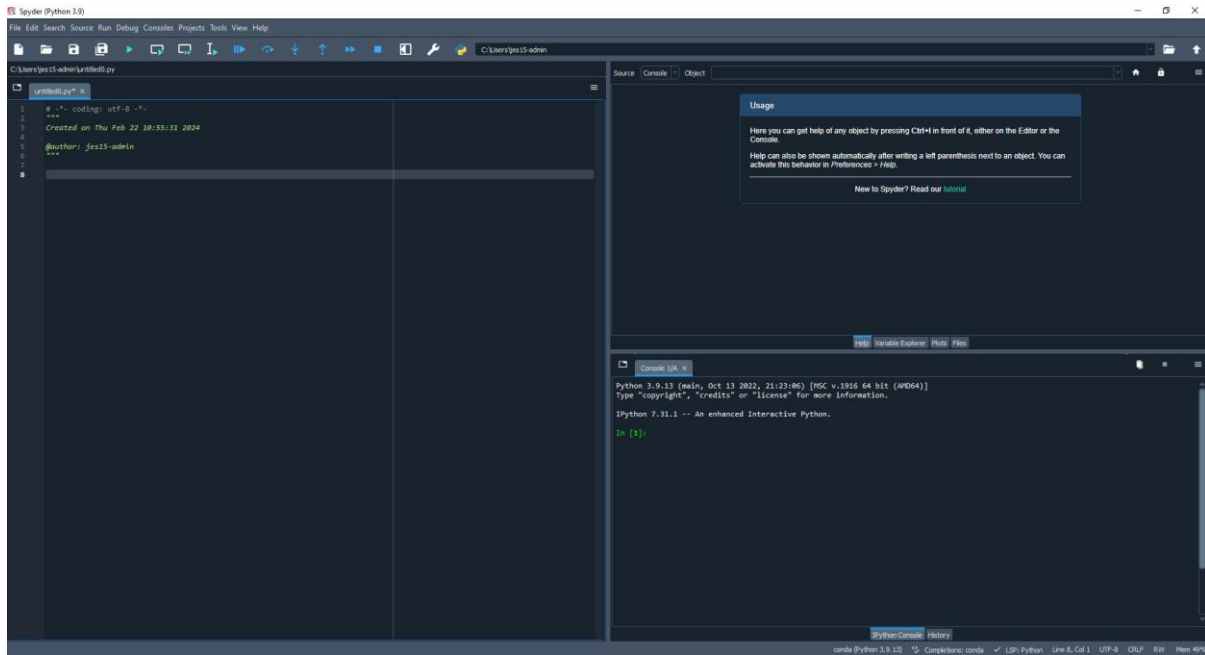
Section 3 – First steps:

Now familiarise yourself with the Spyder layout:

- The interactive console (bottom right)
- Help/Variable explorer/Plots/Files (tabbed in upper right)
- Python scripts (entire left pane)

We will explore this in more detail during our first session.

Reminder: This worksheet is not exploring concepts in detail; our aim is to ensure you are ready to attend the course.

Task 1: Ensure your cursor is flashing in the console screen and enter:

5 + 2

Followed by the return key (enter key). You should get:

Out[1]: 7

Task 2: Set up a project

Project management is important to ensure code maintainability and collaboration. Go to your file manager and create a folder in a convenient location called 'python_projects'. Now go back to Spyder. In the tool bar select 'Projects' > 'New project'. Make sure new directory is selected, write 'test_project' into the project name and make sure the location points to the 'python+projects' folder you just created. If everything is correct you will now have a new pane open on the far left this will show you all your files in this project (currently empty).

In the console type:

import os

Then:

os.getcwd()

You should get an output of your current working directory (wd) and it should be the path and project you specified when creating the project. Understanding wd is important for project organisation and data import and export.

Congratulations, that is the end of the technical sections of this worksheet. If you were unable to complete any of it, please contact jas140@aber.ac.uk before the course commencement data and we will assist.