# Practical Pol-SAR Python

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Running a Jupyter Notebook

The first step once you have installed Anaconda is to open a Jupyter Notebook session. If you are

running a Windows OS, you should see this as an icon on the desktop , or click on Start and search for Jupyter Notebook in the menu.

If you are running a Mac OS, use Launchpad and click on Anaconda-Navigator. When Anaconda opens launch a Jupyter Notebook.

Jupyter will open in a browser. Once it is open, create a new folder where you can upload the scripts. You can do this by using the button "New" and "Upload" on the top right.
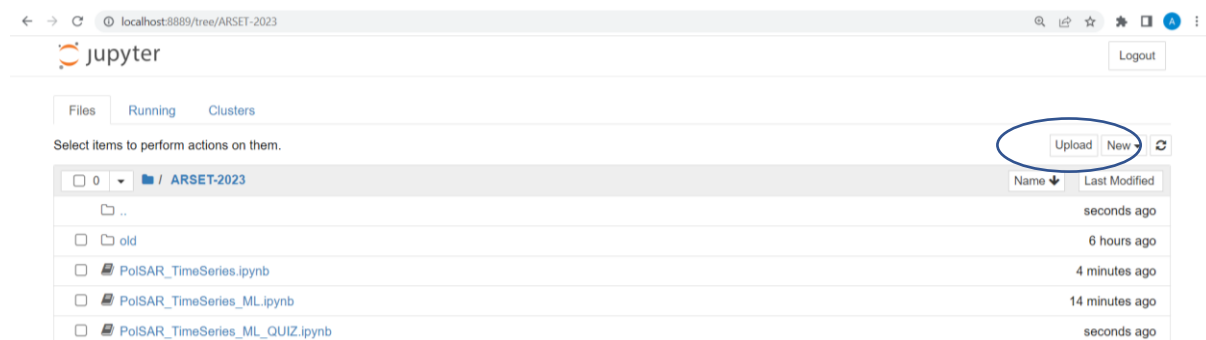

You should start with the notebook **PolSAR_TimeSeries.ipynb**. In this file you will be running code to pre-process the data to a level that is useful for the following machine learning (ML) script. After you have created the datacubes, please run **PolSAR_TimeSeries_ML_QUIZ.ipynb**. You will notice you will have to fill in parts of the script where the word "QUIZ" appears. The file **PolSAR_TimeSeries_ML.ipynb** contains the solutions. My suggestion is that you first try to solve all the QUIZZES and if you get stuck you can look at the solutions. During the video I will discuss the solutions.

Clicking on the file will open the script.
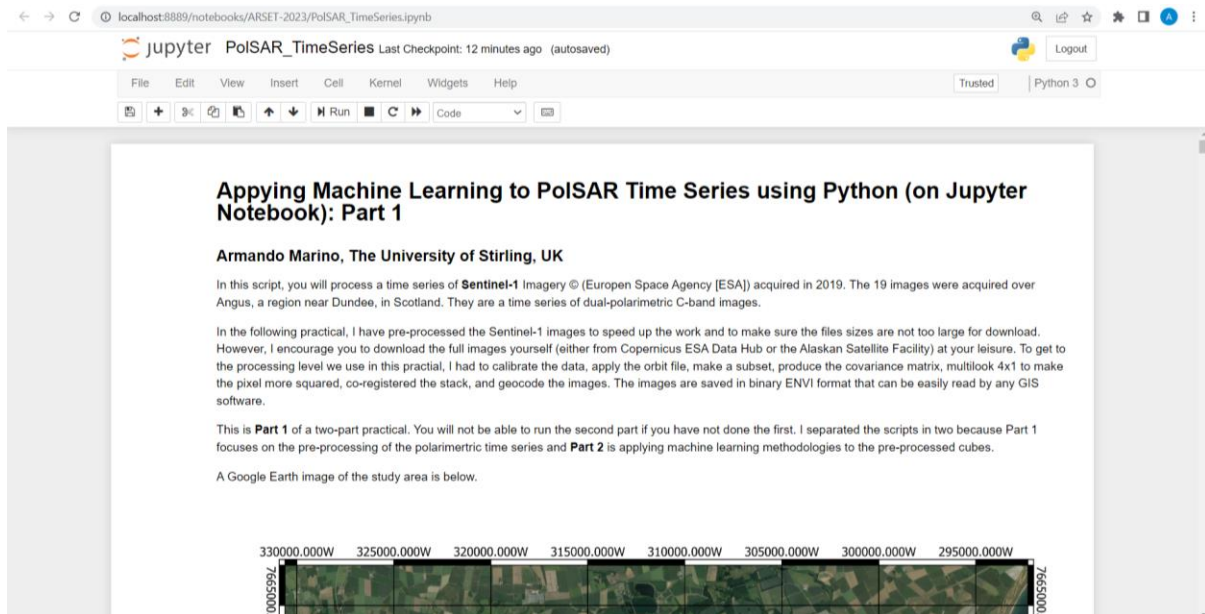
There are several instructions in the Markdown part of the code (i.e., blue Cells) that explain how to run the code. The instructions inside the green Cells have an "In []" on the left side. To run a Cell, click on the Cell and press Ctrl+Enter on Windows (or Shift+return on a Mac). To make sure you are defining all the variables at the right time, you should run cells in their sequence.

If there is an error in a Cell, it will appear in red, as in the following figure where I tried to run a later Cell without running the previous Cell.
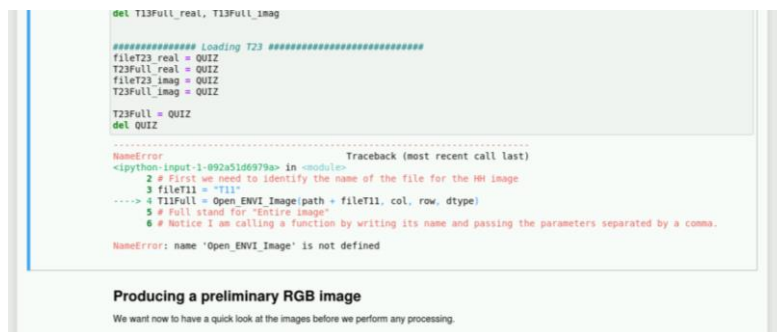
If you get stuck during the practical, please have a look at the Solutions file and see if they make sense. If something does not make sense or if you want to know more, please ask your question during the Q&A session or contact me directly.

Running Python code at home

In order to run Python at home you will need to install it on your machine. My suggestion is to use the *Anaconda* installer, since this makes things very easy (also when you need to install future libraries using *conda*).

https://www.anaconda.com/products/individual#download-section

My suggestion is to choose the latest version (e.g., 3.9) and not the 2.7 version, which is not compatible with the latest 3.x versions.

Once Python is installed you need an editor (to type and run the code). You can either use the Jupyter Notebook (as in the practical) or the Spyder editor. You can find both in the Anaconda installation. Although I find Jupyter better for teaching, you may want to use Spyder for developing projects, since it allows a more agile way of debugging the code. You can convert code from Jupyter- to Spyder-format very easily when you download the code.

I designed this practical so that anybody can run it without installing extra libraries. However, in the script I give the option to use one extra library called Spectral. You can try to install it using conda forge, opening an Anaconda Prompt and writing the text that is suggested by Spectral.

https://anaconda.org/conda-forge/spectral
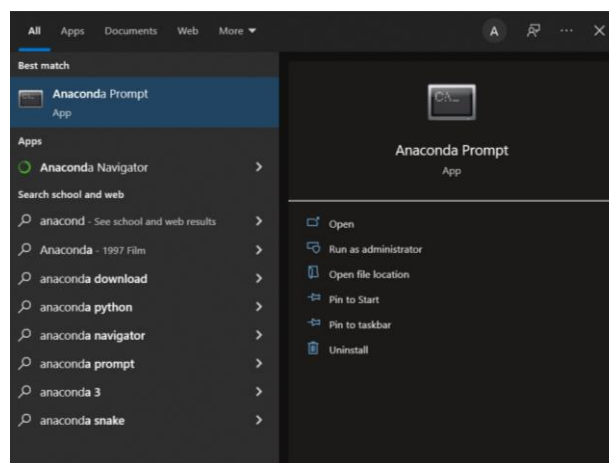
If you don't succeed with installing it right now, it is fine, you can still run the practical without this library.