Modelling Advisory Group (MAG)

Hydrological Uncertainty Workshop

Global Sensitivity Analysis using the SAFE toolbox

23 September 2025

Francesca Pianosi
University of Bristol

Access to software, papers, example: https://safetoolbox.github.io/

Pianosi is funded under the DAFNI Centre of Excellence for Resilient Infrastructure Analysis within the UKRI Building a Secure and Resilient World program, with grant number ST/Y003713/1

How to run a Jupyter Notebooks from browser (no need to install anything on your computer!)

Overview:

1. Download all the required files (Jupyter Notebook + data files + python code files) to your computer from:

https://github.com/FrancescaPianosi/GSAtraining/

2. Upload and run the Jupyter Notebook in your browser through the page:

https://colab.research.google.com (Google Colab - if you have a Google account)

https://safetoolbox.github.io/demos/lab/index.html (Jupyterlite - if you do not have a Google account)

We will use the Jupyter Notebook called *GR6J_GSA_Notebook.ipynb*
but if the interactive visualization is too slow or gets stuck, use *GR6J_GSA_Notebook_static.ipynb* instead
(this is more likely to happen if you are using the Jupyterlite)

francesca.pianosi@bristol.ac.uk

Detailed instructions to download the required files

francesca.pianosi@bristol.ac.uk

1. Download all the required files to your computer

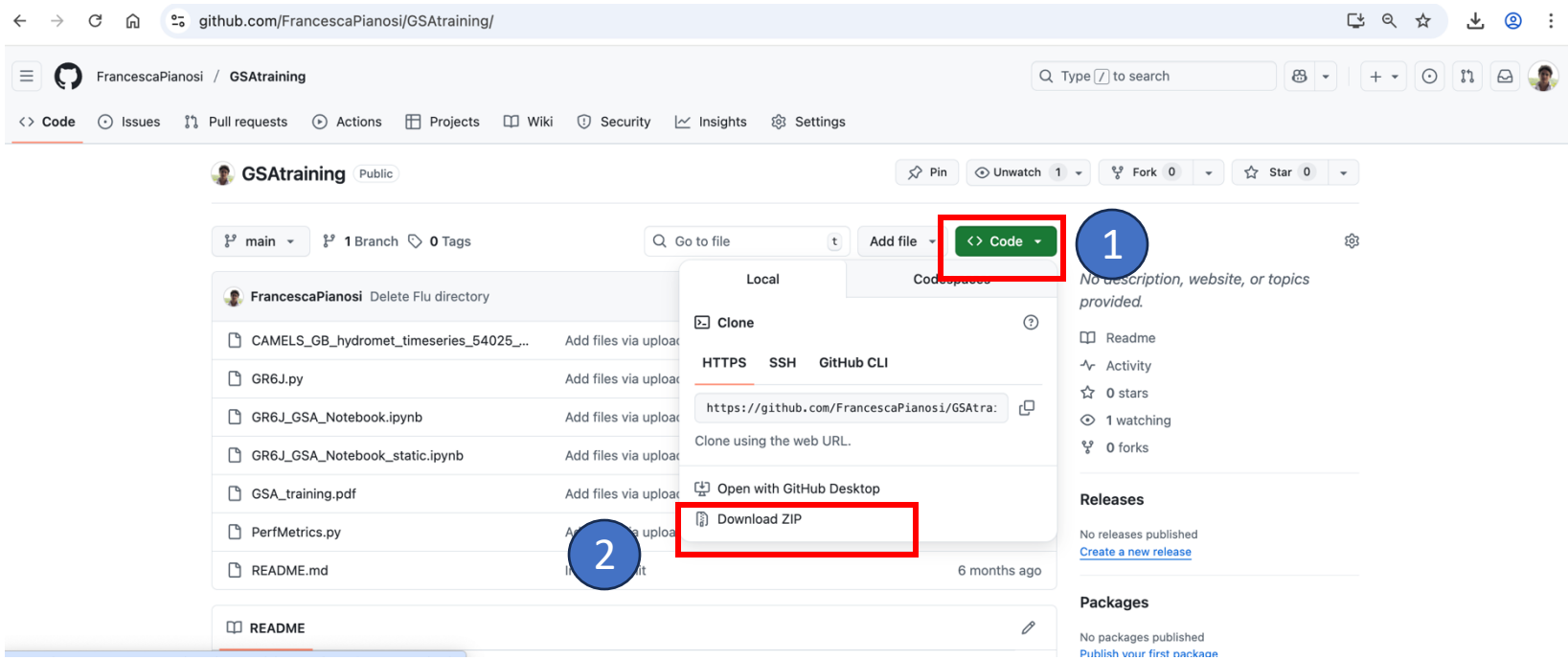
Go to: https://github.com/FrancescaPianosi/GSAtraining/

Click on

< > Code

Download ZIP

Unzip the folder on your computer



francesca.pianosi@bristol.ac.uk

Detailed instructions if you are using Google Colab

francesca.pianosi@bristol.ac.uk

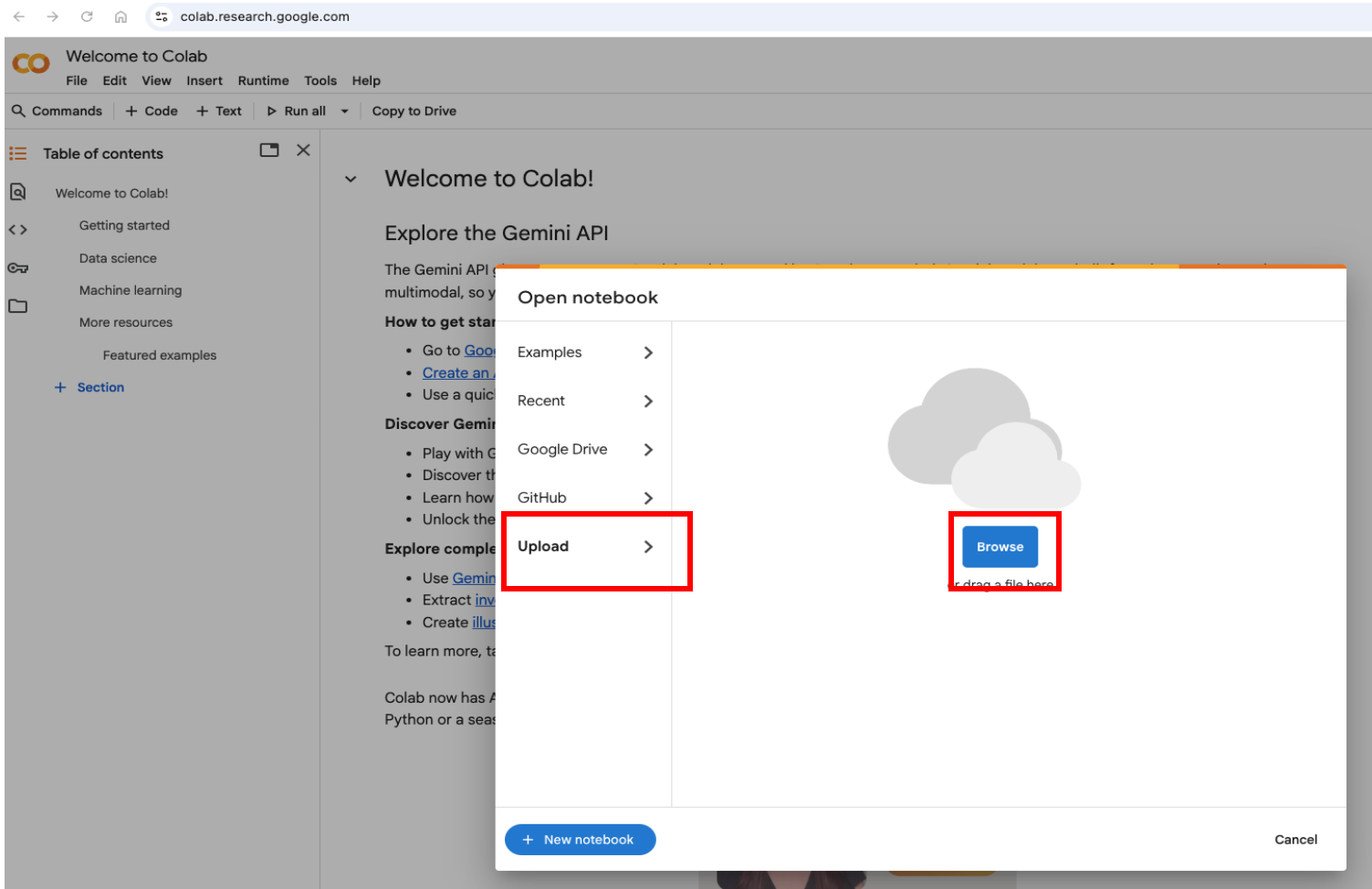
2. Upload the Jupyter Notebook in your browser using Google Colab

Go to: https://colab.research.google.com

A pop-up window should automatically open

Choose “Upload”

Find the *GR6J_GSA_Notebook.ipynb* file on your computer

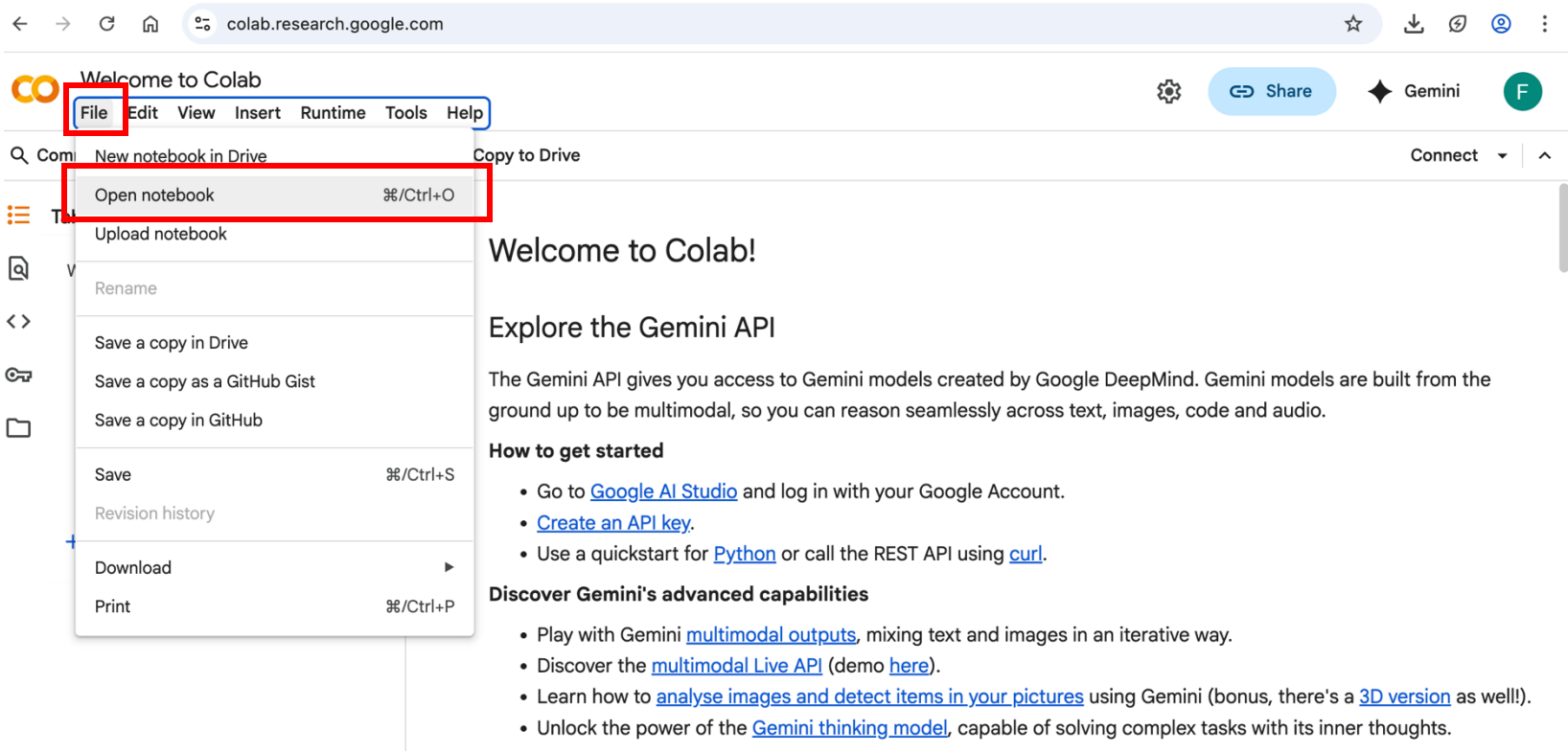


2. Upload the Jupyter Notebook in your browser using Google Colab - *Troubleshooting*

If the upload pop-up window does not open automatically open, go to:

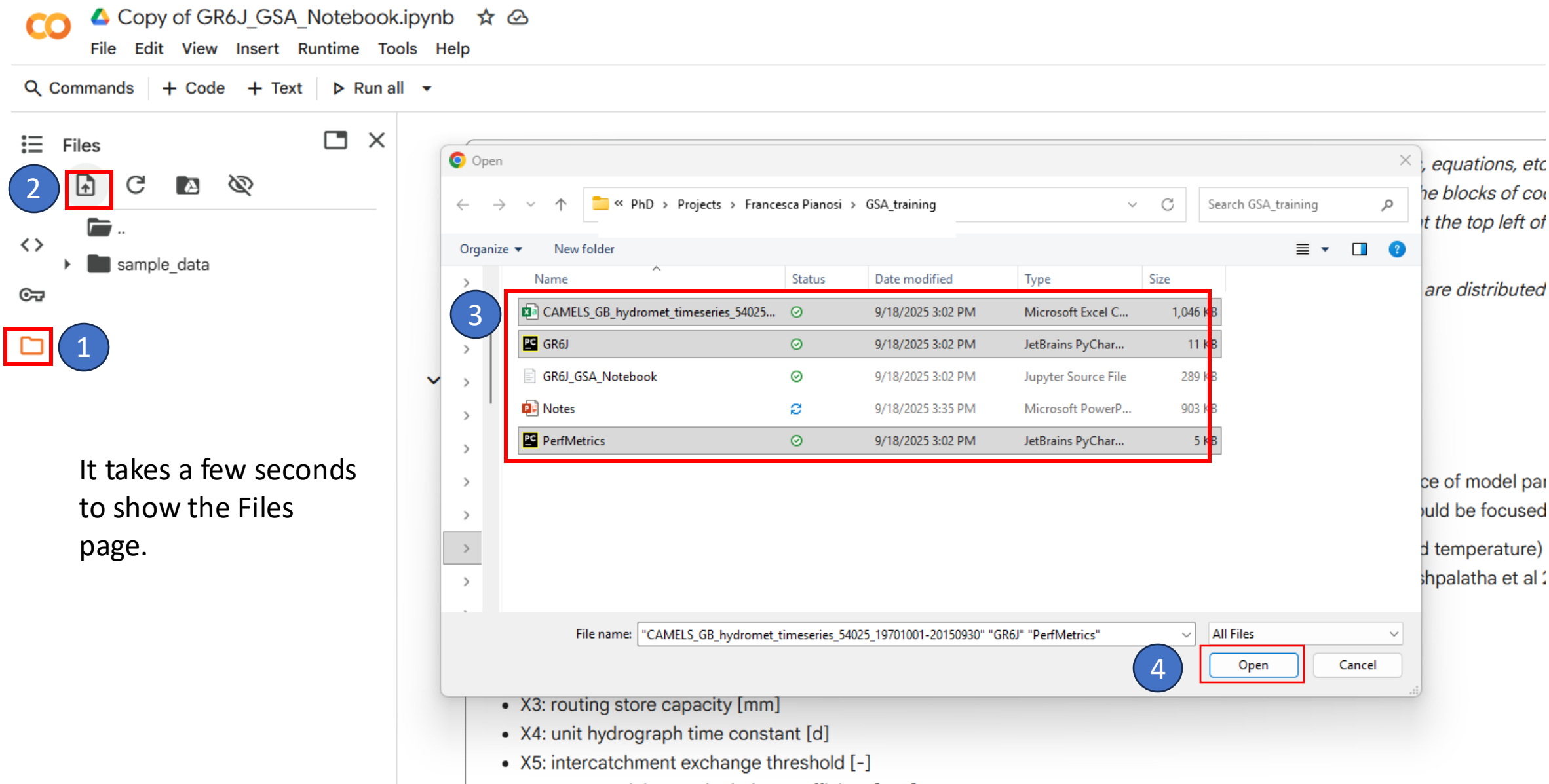
File

Open notebook



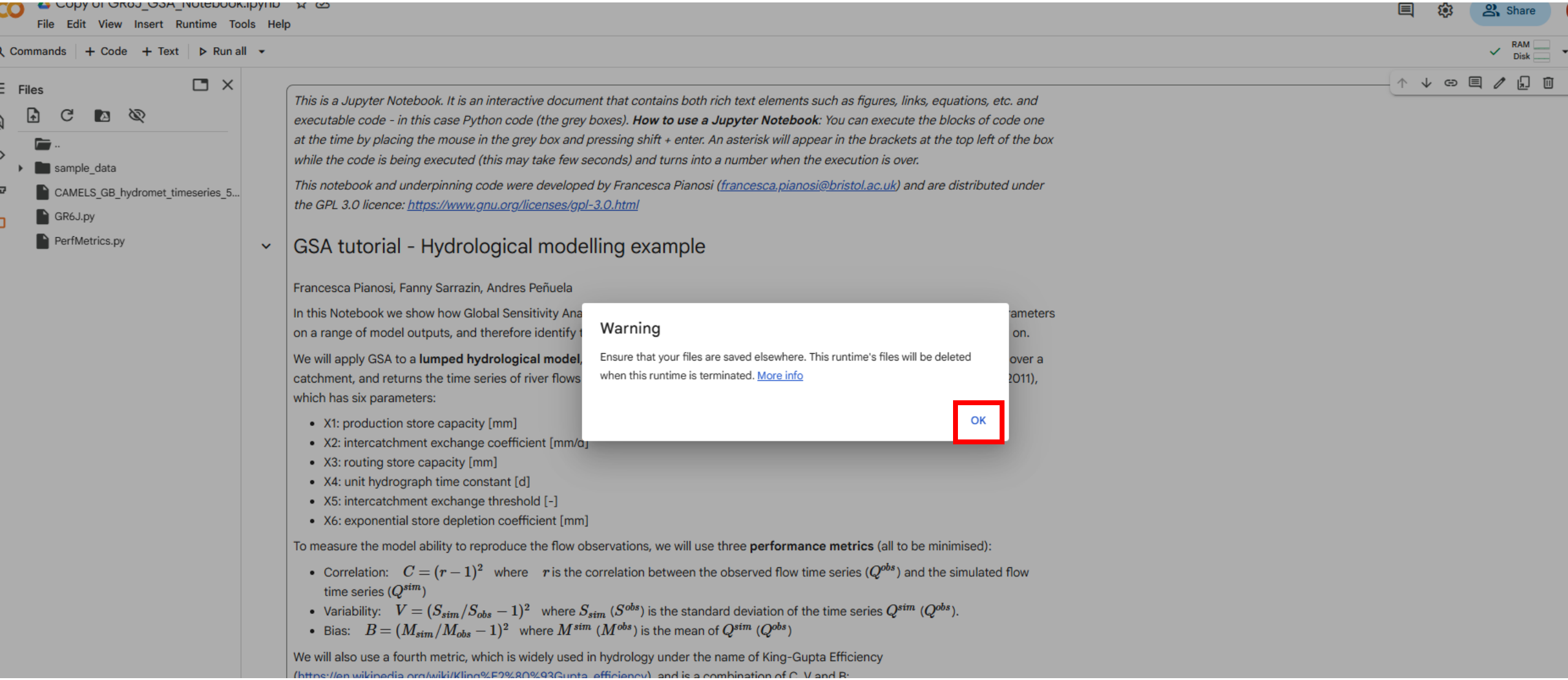
francesca.pianosi@bristol.ac.uk

3. Upload other required files (*.csv* data file and two *.py* code files)

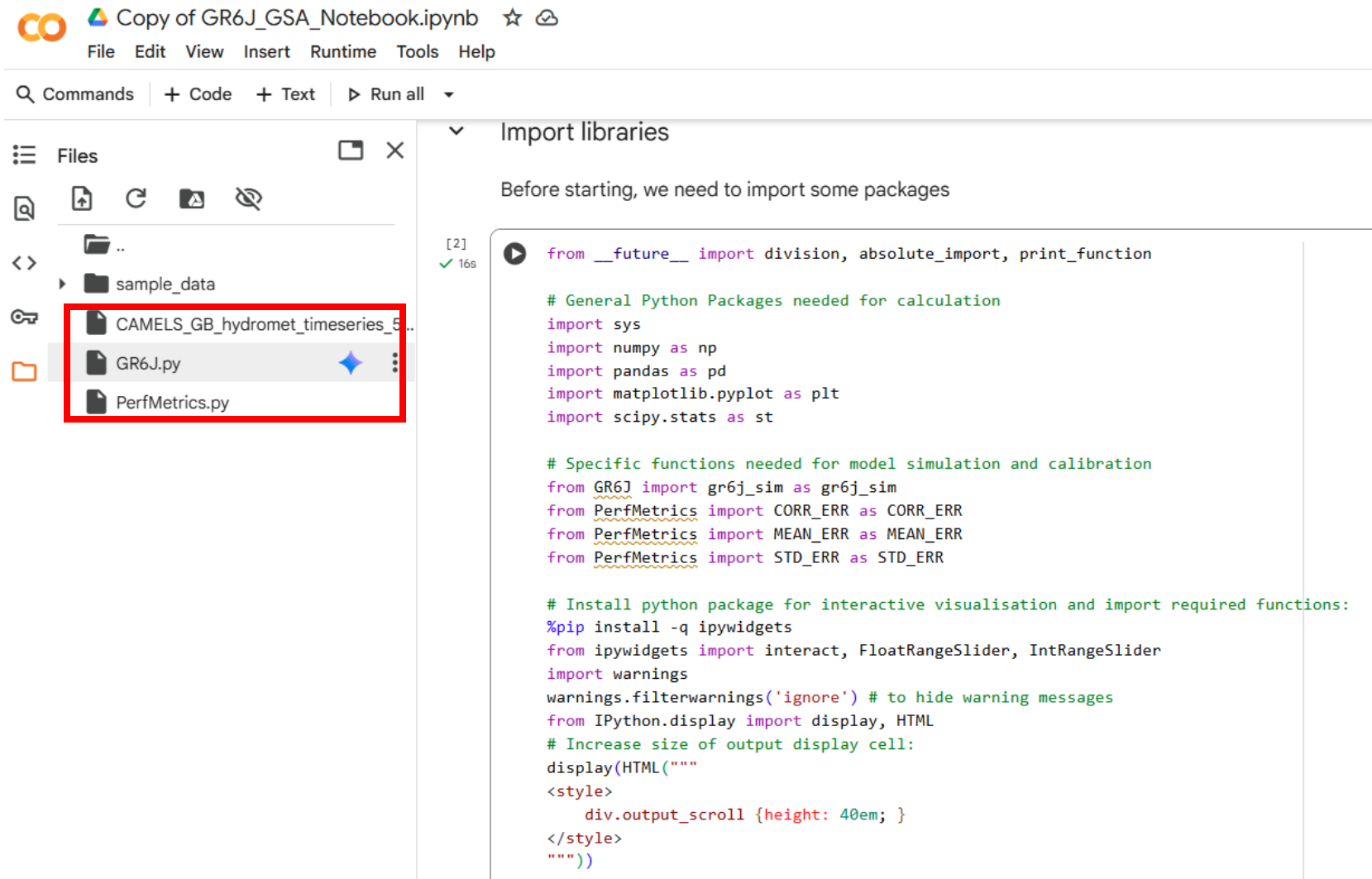


It takes a few seconds to show the Files page.

4. Ignore the warning message



5. Check that all the required files have been uploaded

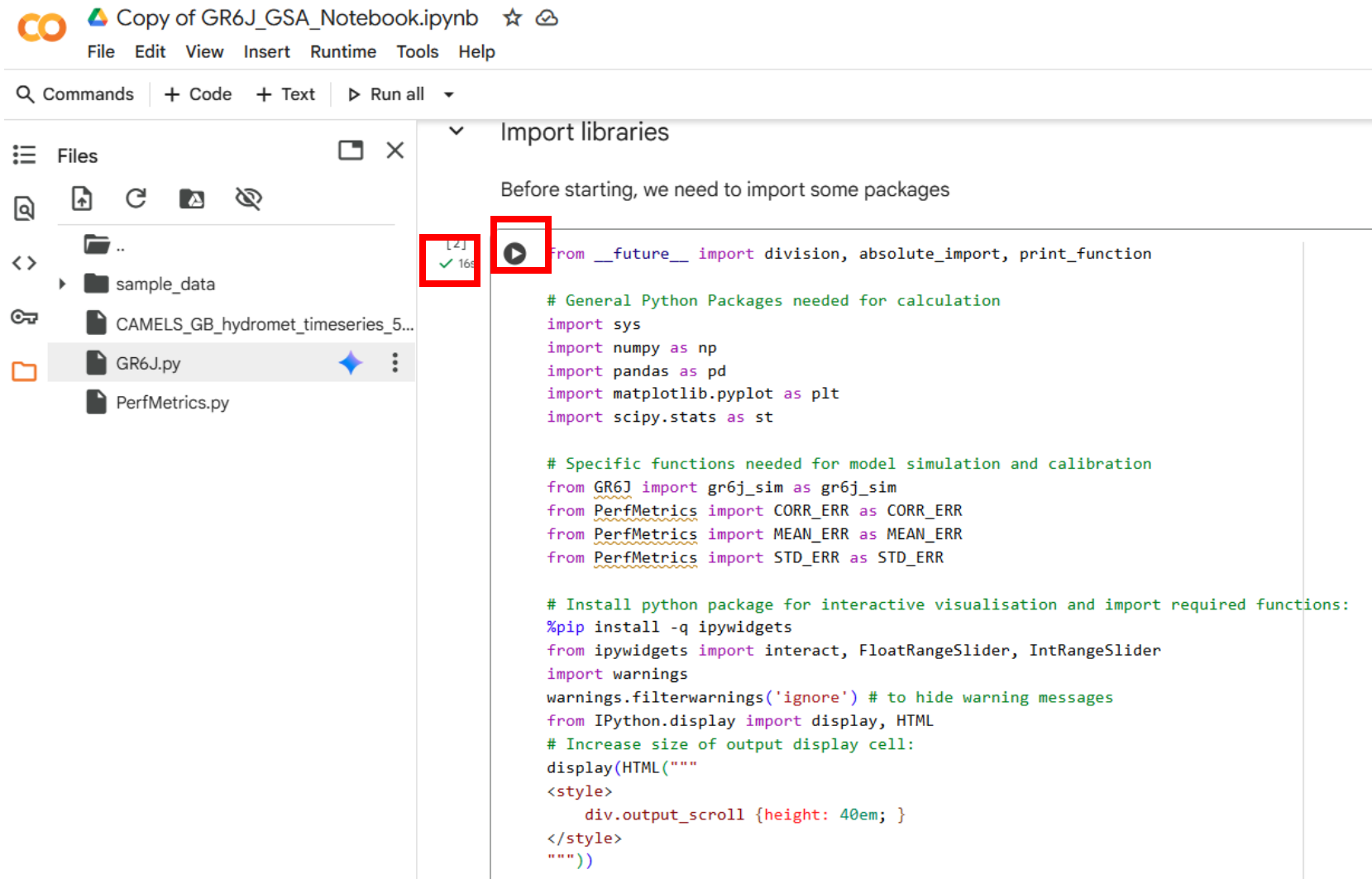


6. Run the code

The Jupyter Notebook includes cells of executable code and cells of text with explanations of what is going on

The cells of code can be executed one at the time by clicking on the “run” icon.

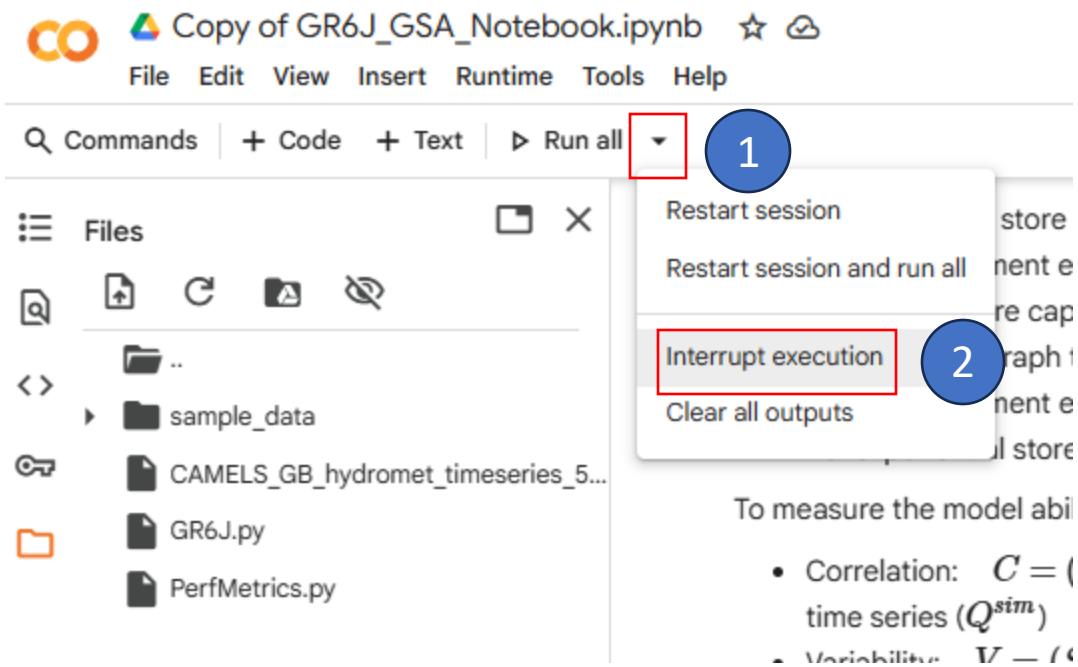
If the code has been executed correctly, a green tick will appear. If the execution produces any plot or numerical results, they will appear under the cell



6. Run the code - *Troubleshooting*

Normally all commands should run in less than a minute

If it takes longer than that, the system may be stuck and you may need to interrupt the execution and repeat



francesca.pianosi@bristol.ac.uk

Instructions if you are using JupyterLite

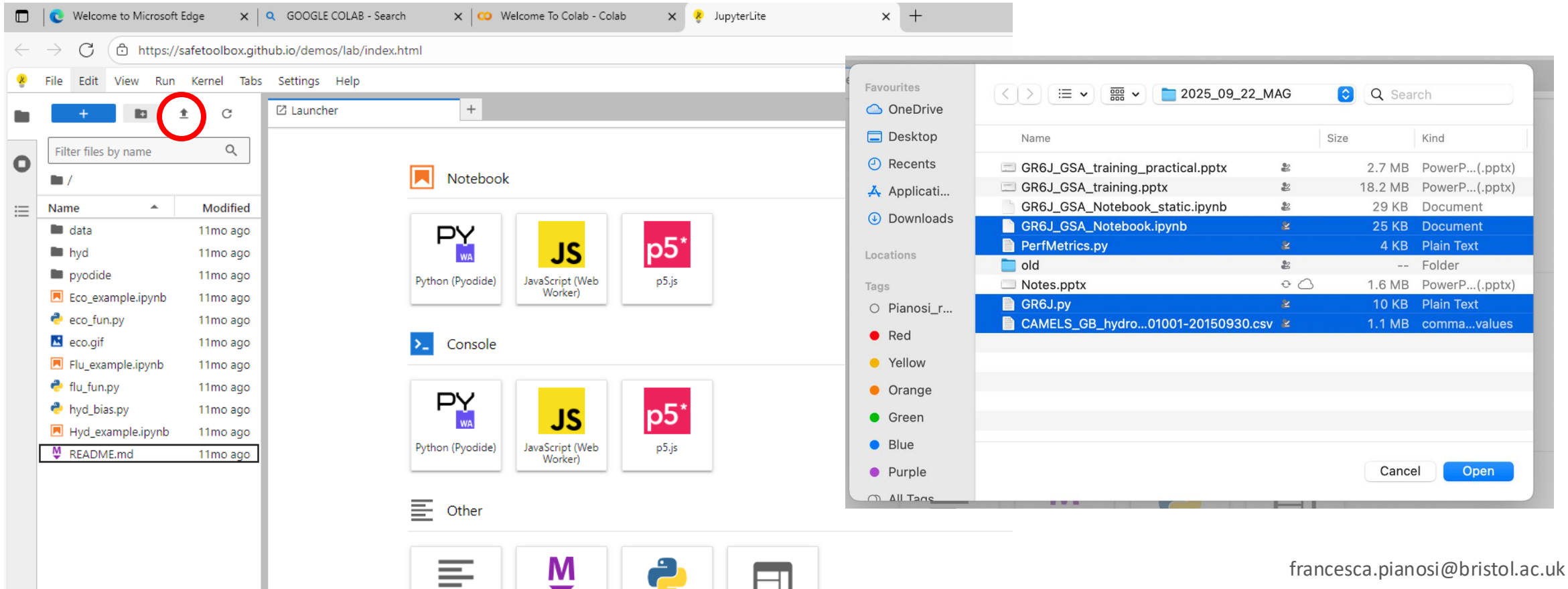
francesca.pianosi@bristol.ac.uk

2. Upload the Jupyter Notebook in your browser using Google Colab

Go to: https://safetoolbox.github.io/demos/lab/index.html

Click on the Upload Files icon on the top left

Find all the files needed on your computer (*GR6J_GSA_Notebook.ipynb* + *GR6J.py* and *PerfMetrics.py* + *.csv* datafile)



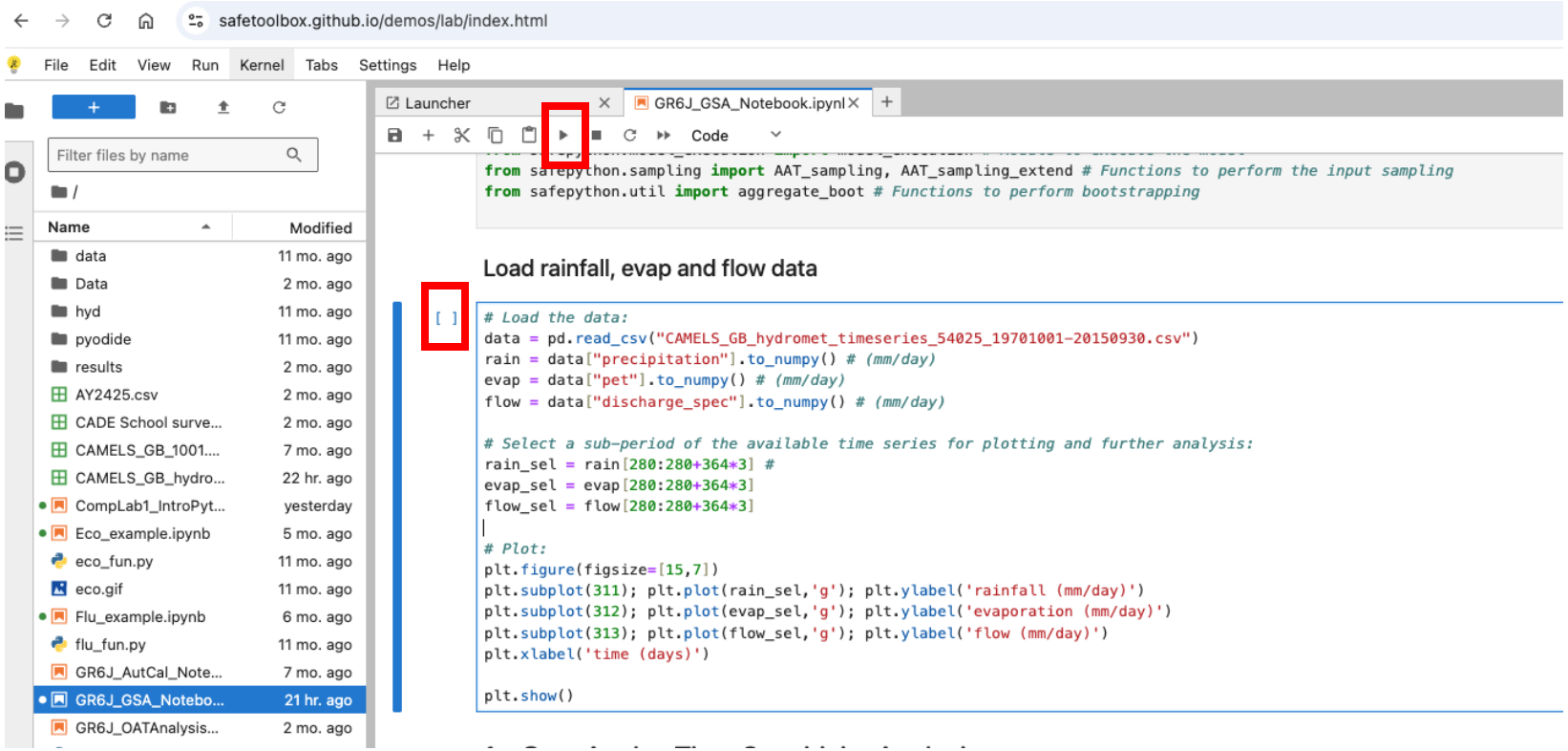
francesca.pianosi@bristol.ac.uk

3. Run the code

The Jupyter Notebook includes cells of executable code and cells of text with explanations of what is going on.

The cells of code can be executed one at the time by selecting the cell with the mouse and clicking the “run” icon at the top (or *shift+enter*).

While the code is running, an asterisk will appear in the brackets next to the cell code. If the code has been executed correctly, the asterisk will be replaced by a number.
If the execution produces any plot or numerical results, they will appear under the cell

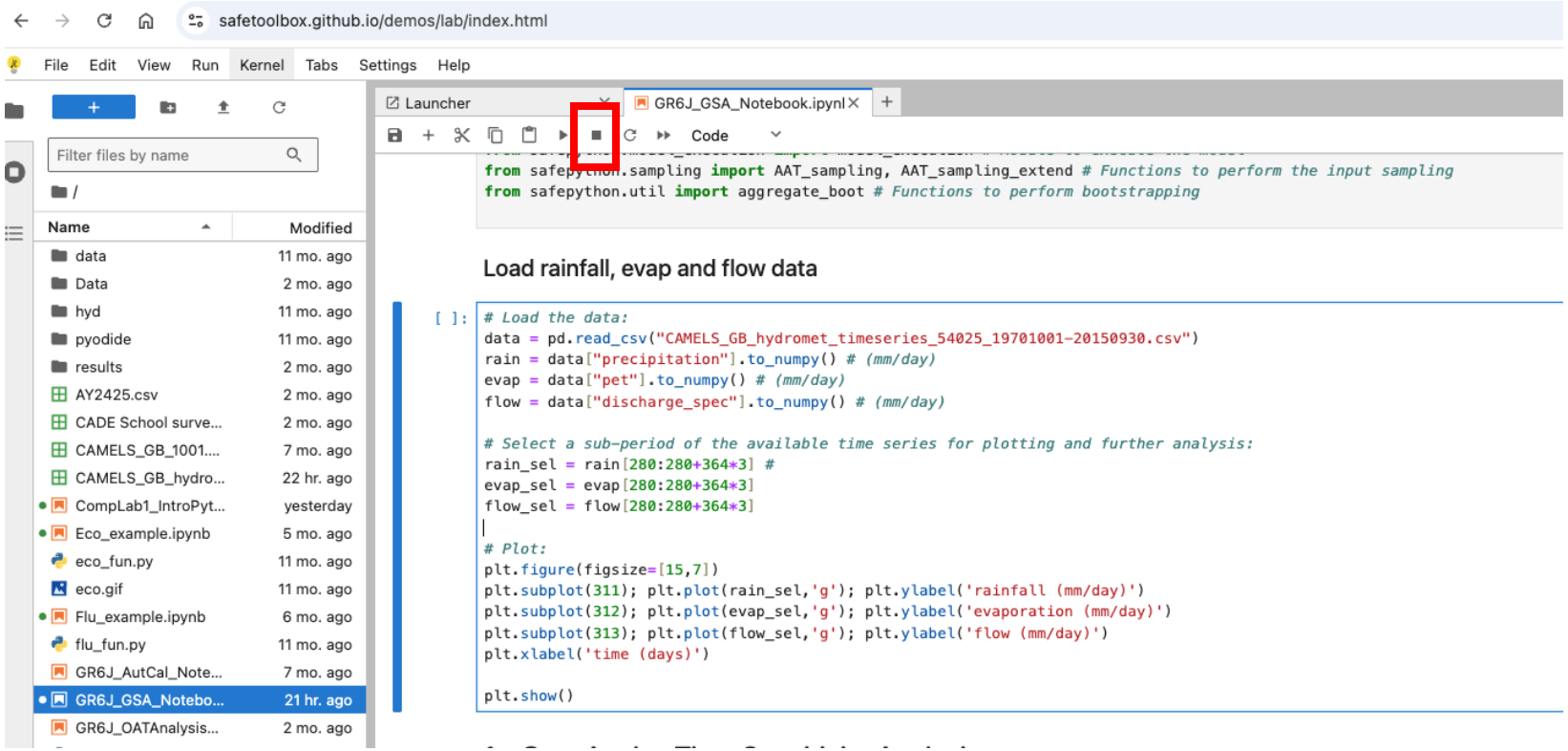


francesca.pianosi@bristol.ac.uk

3. Run the code - *Troubleshooting*

Normally all commands should run in less than a minute

If it takes longer than that, the system may be stuck and you may need to interrupt the execution and repeat



francesca.pianosi@bristol.ac.uk