

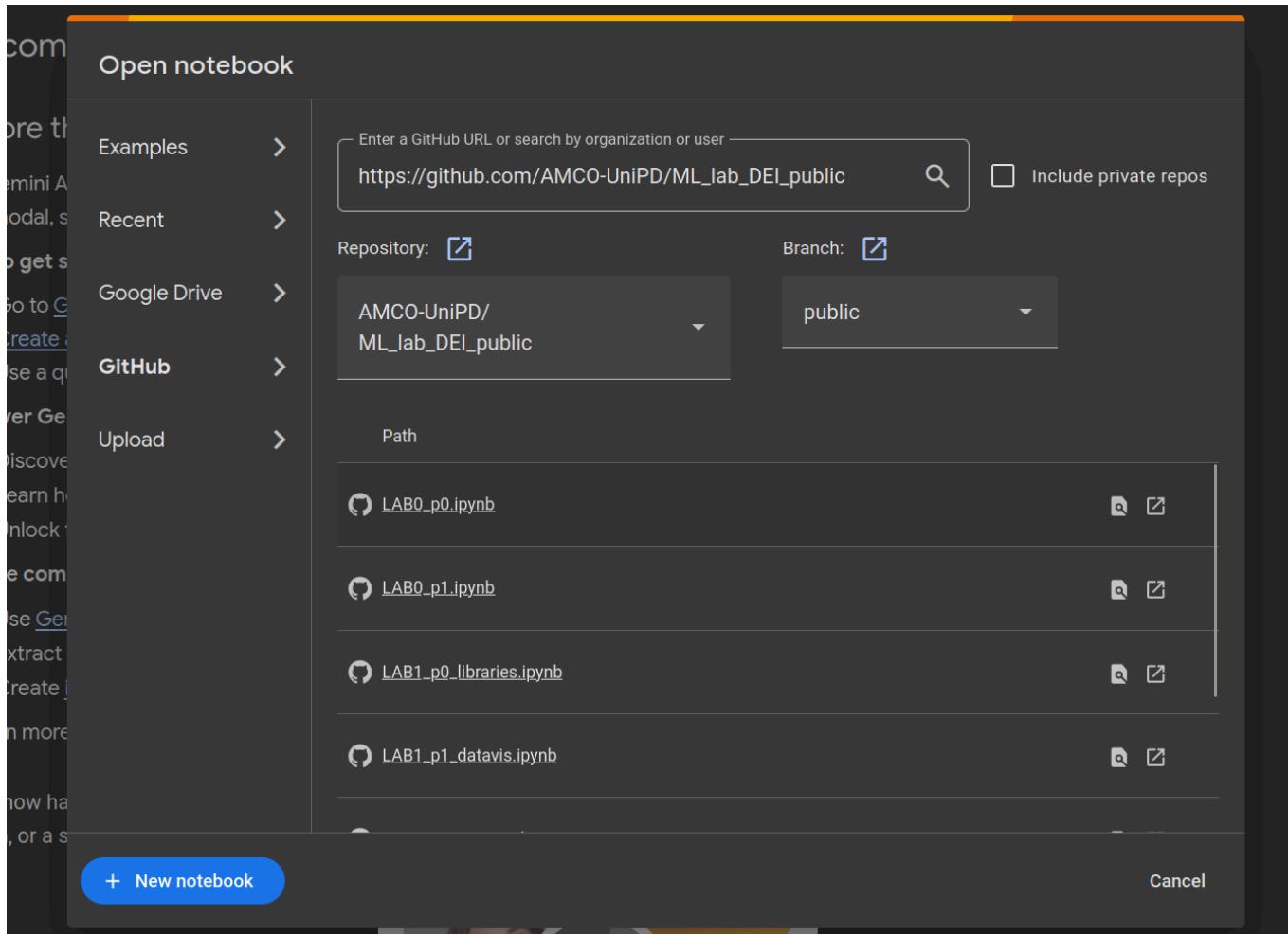
Use Google Colab with GitHub

Usually we just import a single file from a GitHub repository and use it directly in Google Colab.

But sometimes we need other files that contain functions that we write in order to reduce the code inside each notebook.

Import the file

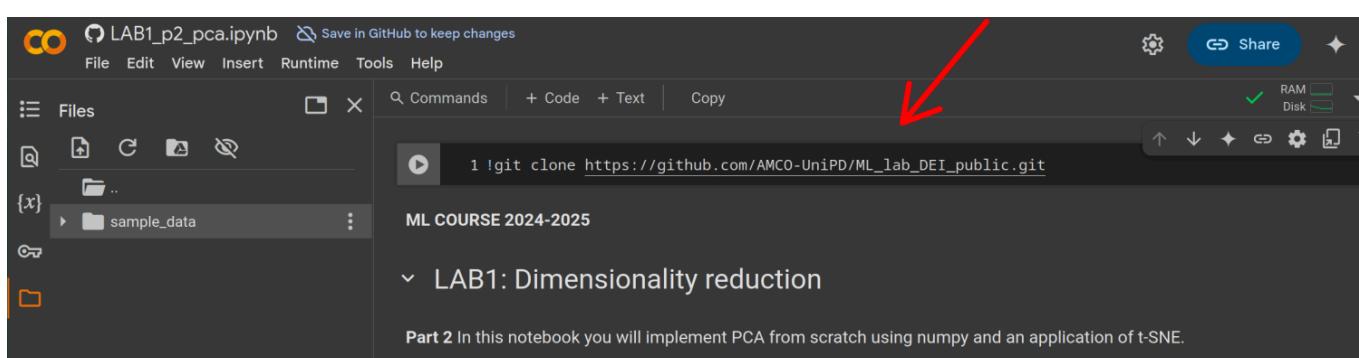
As usual we start by importing the notebook we want to use in Google Colab, by pasting the link to the GitHub repository in the GitHub panel.



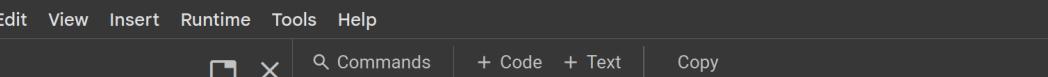
Clone the repository

Open the notebook you are interested in and create a code cell at the beginning, and write the following line of code:

```
!git clone https://github.com/AMCO-UniPD/ML_lab_DEI_public.git
```



Execute the cell by clicking the play (▶) button. An output similar to this will appear under the cell:



The screenshot shows a Jupyter Notebook interface with a terminal output. The terminal output shows the command `!git clone https://github.com/AMCO-UniPD/ML_lab_DEI_public.git` being run, followed by the progress of the cloning process:

```
1 !git clone https://github.com/AMCO-UniPD/ML_lab_DEI_public.git
Cloning into 'ML_lab_DEI_public'...
remote: Enumerating objects: 80, done.
remote: Counting objects: 100% (80/80), done.
remote: Compressing objects: 100% (60/60), done.
remote: Total 80 (delta 25), reused 57 (delta 11), pack-reused 0 (from 0)
Receiving objects: 100% (80/80), 10.97 MiB | 22.16 MiB/s, done.
Resolving deltas: 100% (25/25), done.
```

Also, note that the directory `ML_lab_DEI_public` appeared in the file explorer to the left.

Extract the files

Now we need to put all the files in the main directory, to do that we can execute the following command in another code cell:

```
!mv ML_lab_DEI_public/* .
```

As you can see, many files appeared in the file explorer to the left:

File Edit View Insert Runtime Tools Help

Files

- ..
- ML_lab_DEI_public
- drive
- sample_data
- LAB0_p0.ipynb
- LAB0_p1.ipynb
- LAB1_p0_libraries.ipynb
- LAB1_p1_datavis.ipynb
- LAB1_p2_pca.ipynb
- ML_lecture 07.pdf
- README.md
- git_intro.ipynb
- jupyter_docker_install.md
- update.sh
- utils.py

Commands + Code + Text Copy

```
2s [1] 1 !git clone https://github.com/AMCO-UniPD/ML_lab_DEI_public.git
→ Cloning into 'ML_lab_DEI_public'...
remote: Enumerating objects: 80, done.
remote: Counting objects: 100% (80/80), done.
remote: Compressing objects: 100% (60/60), done.
remote: Total 80 (delta 25), reused 57 (delta 11), pack-reused 0 (from 0)
Receiving objects: 100% (80/80), 10.97 MiB | 22.16 MiB/s, done.
Resolving deltas: 100% (25/25), done.
```

```
0s 1 !mv ML_lab_DEI_public/* .|
```

ML COURSE 2024-2025

LAB1: Dimensionality reduction

Part 2

In this notebook you will implement PCA from scratch using numpy and an application on

Summary

- Part 0: Data Structures, introduction to NumPy, pandas, matplotlib and seaborn.
- Part 1: Datasets analysis, statistics and visualizations.
- Part 2: PCA from scratch