Learning with Artificial Neural Networks

Practical Work 01 – Data Exploration

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Goals:

- Refreshing your knowledge of data exploration, data visualization and performance evaluation with python, numpy, sklearn and matplotlib.
- Discovering feature extraction with Fourier transforms of EEG data.

Introduction

The first step of a Machine learning project is getting knowledge about the data you are going to use for modeling (e.g., for building a classifier). This process is often called "exploratory data analysis".

In this practical work, we will explore a dataset about mice's sleep obtained from CHUV. This dataset includes the Electroencephalogram (EEG) of a mouse, as well as its state. In the long run the objective would be to be able to recognize mice sleep stages from their EEG.

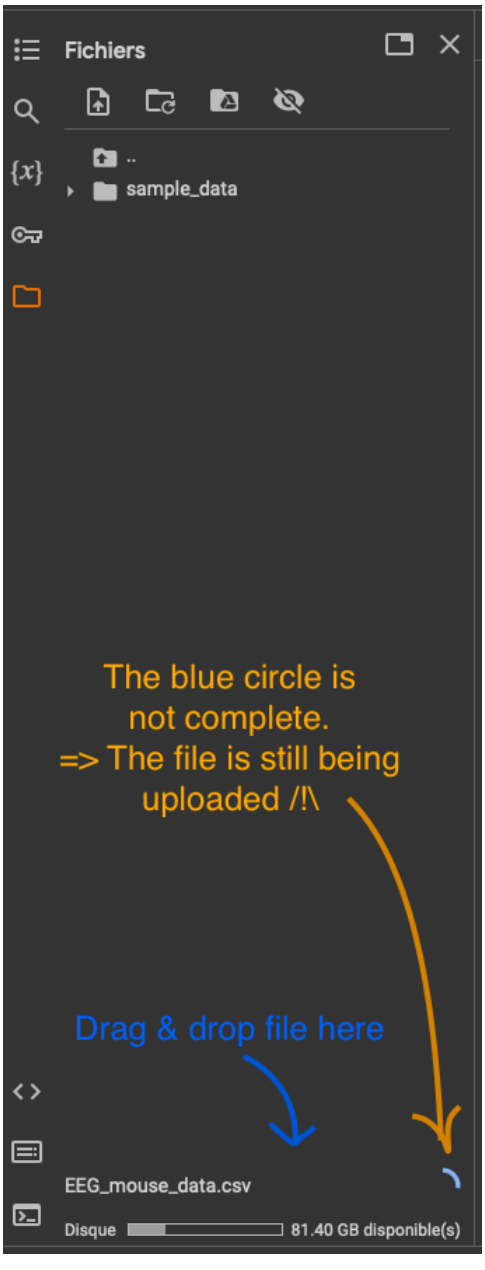
You will both need to analyse the data and to write some code. You can use an LLM (i.e. ChatGPT), especially for the code, but make sure you verify and understand the output it gives you.

First steps

We tested this notebook on Google Colab. To ensure that everything work correctly, we recommend you to use it too.

You will need have a Google account to use Colab.

Make sure you upload the data file *EEG_mouse_data.csv* in your Colab environment and wait until the file is entirely uploaded before executing the code. Look at the image on the right to see how to do it.



Report

You don't need to write a report. Please answer the questions as an exercise to refresh your knowledge of data exploration and data visualisation. You will also get familiar with this dataset that will be used in an upcoming practical work.

Nonetheless if you have constructive feedbacks concerning this practical work, please let us know.