## Description of the session

The goals of this lab will be the following:

1. Using Numpy, implement the training process of a basic Multi Layer Perceptron to solve regression problems on toy datasets.
2. Implement custom optimizers to perform gradient-descent and train the MLP.
3. Introduce automatic differentiation (AutoGrad) on PyTorch and implement the basic MLPs using it.

### Lab preparation:

1. Create a folder P1 in DeepLearning\_2023 and upload all the material included in P1.zip that you can find in Moodle.
2. Read and run some examples in the P1.Examples.pynb file to familiarize with the different topics that we will see in the session.

### Material:

* 1. P1-Examples.pynb: Examples that will be explained at the beginning of the session
  2. P1-Questions.pynb: Description of the exercices that you will need to do and deliver (see below)
  3. Data folder: Different files used in the examples and exercises.
  4. Results folder:

### Delivery :

Solve the exercises in P1-Question.pynb, and write a report showing and discussing the relevant results in each question and how you have solved it. Save the results in the “Results'' folder when necessary.

Submit a zip file to moodle on the corresponding Seminar/Practice Slot as:

**P1\_NIA1\_NIA2\_NIA3\_LASTNAME1\_LASTNAME2\_LASTNAME3.zip**

Include the following files in the zip:

* **P1-Questions\_Answers.pynb:** Your code to solve each of the questions,
* **P1-Report.pdf:** A pdf with the report for the lab as described before
* **Results folder:** Including all the data that you have generated solving the results

The score in this lab represents the 10% of the total lab sessions mark. **Delivery data is indicated in Moodle.** Any delay will be considered as a non-delivered lab and **no extensions will be given**.