Tutorial

Send an email at the following address: [samuel.rochette@epfedu.fr](http://samuel.rochette@epfedu.fr)

It must contain a HTML export of the python notebook you’ll create.

Open a new python notebook for each of the 6 sessions we will have together. Please use markdown and make it comfortable to read.

# A first model: LR

1. Install tensorflow and load the CIFAR10 data

| from tensorflow.keras import datasets (train\_images, train\_labels), (test\_images, test\_labels) = datasets.cifar10.load\_data() |
| --- |

1. Display the 3 first images and print their shape
2. Install sklearn and train a [logistic regression](https://scikit-learn.org/stable/modules/generated/sklearn.linear_model.LogisticRegression.html#sklearn.linear_model.LogisticRegression) to classify the data (you’ll need to find a way to adapt the input data)
3. Evaluate the performances on the test data, is it good?

# A first simple CNN

1. Use [this tutorial](https://www.tensorflow.org/tutorials/images/cnn) to train a convolutional neural network
2. Compare the performances with the logistic regression and comment the results
3. Compute and display the probability distributions of the 2 highest probabilities outputted by the model on the test images. Does the model seem confident in itself?
4. Change the architecture (by adding layers) and the hyperparameter to enhance the results

# Custom model

Use the python library of your choice and build a model that outperforms the previous results on this task and dataset.