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# Lab Session 7

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## ▼ 1. Introduction

In this lab session, you will use a lot of the previously seen classifier on the iris dataset

## 2. Ressources

Libraries Documentation

Python : <https://docs.python.org/3/>

NumPy : <https://numpy.org/doc/>

SciPy : <https://docs.scipy.org/doc/scipy/>

Matplotlib : <https://matplotlib.org/3.5.1/>

Panda : <https://pandas.pydata.org/docs/>

mglearn : <https://libraries.io/pypi/mglearn>

sklearn : <https://scikit-learn.org/stable/>

PyTorch : <https://pytorch.org/docs/stable/index.html>

\*to proceed with the lab session, refer to this section

## 3. Setup

to install pyTorch in UTBM Desktops :

Create and activate your conda environnement (refers to moodle)

Install pytorch packages in conda environment using the following instruction

```
!pip3 install torch torchvision torchaudio
```

## ▼ 4. IRIS dataset

```
from sklearn.datasets import load_iris
from sklearn.model_selection import train_test_split

#load iris dataset
iris = load_iris()

#convert dataset to pandas DataFrame
df = pd.DataFrame(data = np.c_[iris['data'], iris['target']],
                  columns = iris['feature_names'] + ['target'])
df['species'] = pd.Categorical.from_codes(iris.target, iris.target_names)
```

```
df.columns = ['s_length', 's_width', 'p_length', 'p_width', 'target', 'species']

X = df[['s_length', 's_width', 'p_length', 'p_width']]
y = df['species']

#define data to plot
X = iris.data
y = iris.target

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.33,
                                                    random_state=42)
```

## Exercise

Build a prediction model (accuracy above 90%) with :

- KNN
- Decision Tree
- Random Forest
- Naive Bayes
- LDA
- QDA
- Neural Network