Introduction to Data Science

Homework 4: Introduction to Machine Learning (ML)

Exercise 1: Introduction to ML

Explain in a few sentences, what is machine learning, what is

supervised learning (SL) and unsupervised learning (UL).

Exercise 2: Introduction to ML

a) Explain in a few sentences the concepts of classification and regression and give some examples for applications in real life.

b) Explain in a few sentences the concepts of clustering and dimensionality reduction and give some examples for applications in real life.

c) Do the types A) and B) belong to supervised or unsupervised learning? Explain why.

d) What is reinforcement learning? Give an example for application in real life.

Exercise 3: Python tools for ML

Perform simulations and test/play with the python codes using scikit-learn (https://scikit-learn.org/stable/)

for one of the following topics (cf. the lecture slides, part 3):

a) Classification using SVM applied to the Iris data set.

b) Regression using a toy data set (two sine waves with noise) and apply the Multi-layer Perceptron regressor.

c) Clustering using K-means and apply it to the Iris data set.