UNIVERSITAT DE BARCELONA

Introduction to Machine Learning

Master in Artificial Intelligence

UPC, UB, URV

Course. Introduction to Machine Learning

Work 1. Level Exercise

Course 2024-2025

Dr. Maria Salamó Llorente

Dept. Mathematics and Informatics,

Faculty of Mathematics and Informatics,
University of Barcelona

Contents

Introduction

Code and Packages

- You need to implement the code using **Python 3.9** and **Pycharm IDE**
- **This work is individual, you are not working in groups yet.**

- Packages allowed in this exercise:
  - numpy
  - pandas
  - scipy
  - scikit-learn (only for some parts)
  - matplotlib
  - seaborn

Exercise 1

Elementary Python Exercise

Elementary Python exercise

- You will find a code in Racó, called `Exercise_1.py`, that you need to fill in the gaps of code to complete it
- It is an elementary exercise to practice with ***numpy***

- Steps:
  - Install Python and SciPy platform
  - Install PyCharm IDE
  - Create a PyCharm project
  - Include the file `Exercise_1.py` to the PyCharm project
  - Complete the code and run it
    - it should extract the same results as described at the end of the file

Exercise 2

Hello World in Machine Learning

Hello World Machine Learning Exercise

- Read, understand and create a python file in a PyCharm project with all the code to do your first Hello World in Machine Learning
- Process:
  - Install Python and SciPy platform
  - Include a new file in the previous PyCharm project, `Exercise_2.py`
  - Follow the instructions made in the video
    - Import the Data
    - Clean the Data
    - Split the Data into Training/Test Sets
    - Create a Model
    - Train the Model
    - Make Predictions
    - Evaluate and Improve

Look at the video:

https://youtu.be/7eh4d6sabA0

and replicate the example in PyCharm

Exercise 3

Overview to the Machine Learning Process

Overview to ML process

- Follow the instructions described in:
  - https://machinelearningmastery.com/machine-learning-in-python-step-by-step/

A machine learning project may not be linear, but it has a number of well known steps:

- Define Problem
- Prepare Data
- Evaluate Algorithms
- Improve Results
- Present Results

How to deliver

- Deliver the PyCharm project with exercise 1, exercise 2, and exercise 3 in Campus Virtual at UB (`campusvirtual.ub.edu`) in a **zip file** with your name and surname and the number of the work
  - Example: **LisaSimpsonWork1.zip**

- **DELIVERY DATE: September, 29th**