Exercise 0 - Introduction to Python Programming

This exercise, whose maximum mark would be 5 points, is a practical reinforcement of the knowledge acquired in the first practical sessions of the Machine Learning subject, where we introduced the basics of Python, Matplotlib, Numpy and Scikit-learn.

Deadline: **5th of April 2021**
Submission site: PRADO

In this exercise, the students will have to:

1. Part 1
   - Read the iris database in scikit-learn.
   - Get the feature vectors (input data X) and their class (y).
   - Extract features 1 and 3 (first and third columns of X).
   - Visualize the data with a Scatter Plot, coloring each class with a different color (orange, black and green), and indicating the class for each color in a legend.
2. Part 2
   - Split randomly the sample into two sets: training (75 % of data) and test (25 %), but preserving the proportion of labels in both training and test to avoid underrepresented classes.
3. Part 3
   - Obtain 100 equispaced values between 0 and 4π.
   - Obtain the value of $\sin(x)$, $\cos(x)$ and $\tanh(\sin(x) + \cos(x))$ for the 100 previously calculated values.
   - View the three curves simultaneously on the same plot (with dashed lines in green, black, and red).