Machine Learning **Universität Hamburg**
Spring 2023 Sören Laue

Exercise Sheet 8

On this exercise sheet, you are asked to run a number of regression and classification tasks. You are allowed (and encouraged) to use scitkit-learn for all of them.

Exercise 1

Run regression using the k-nearest neighbors approach on the dataset R. You find the corresponding training and test data set under `dataset_R_train.npy` and `dataset_R_test.npy`.

Exercise 2

Run the k-nearest neighbors algorithm to classify the datasets E, G, and O. You find the corresponding training and test data set under `dataset_E`, `dataset_G`, and `dataset_O` with the corresponding ending `_train.npy` and `_test.npy`.

Exercise 3

Run the same classification tasks as in Exercise 2 but now using linear discriminant analysis (LDA).

Exercise 4

Run the same classification tasks as in Exercise 2 but now using quadratic discriminant analysis (QDA).

Exercise 5

Solve the classification task on the digits dataset (`load_digits()` and `train_test_split()`). Use the following methods and report their train and test scores for each method: k-nearest neighbors classifier, LDA, and QDA.

Please turn in your solutions by Wednesday, June 14th.