Cross-Validation and k-Nearest Neighbor Classification

*Option 1.* Study the *KNeighborsClassifier* class from the *scikit-learn* library. For the *iris* dataset, find the best combination of hyperparameters (*n\_neighbors*, *weights* and *metric*) for the *kNN* classifier according to its *F*1-score of cross-validation. You do not have to check each combination manually. Use lists and for-loops. Also you can use the GridSearchCV to perform this subtask. **70 / 100 points**

*Option 2.* Try to implement K Nearest Neighbors classifier **without** the *scikit-learn,* For the *iris* dataset, find the best combination of hyperparameters (*type of window, h or k,* *metric*) for the *kNN* classifier according to its *F*1-score of cross-validation. You can use the GridSearchCV to perform this subtask. **100 / 100 points**

*Option 3\*.* Try to implement K Nearest Neighbors classifier **with or without** the *scikit-learn,* but for any multiclass dataset. You can use the GridSearchCV to perform this subtask. **150 / 100 points**

For the best combination of parameters (*weights* and *metric*) found, build a plot of quality of classification as a function of the number of nearest neighbors.

https://en.wikipedia.org/wiki/Kernel\_(statistics)