**Exercise 2:**

*This exercise may be done in groups of 2 – 3 people. If so, please explicitly state all group member names on your hand-in!*

For this exercise you should first find a suitable text classification dataset from any source, e.g. from

* <https://www.kaggle.com/datasets>
* <https://archive.ics.uci.edu/ml/index.php>
* <https://www.tensorflow.org/datasets>
* <https://datasetsearch.research.google.com/>
* <https://github.com/niderhoff/nlp-datasets>

Do the following tasks:

* Shortly describe your dataset:
  + Short description in words (source, use case, trivia, etc.).
  + What are the classes? What are the class distributions? What is the baseline for this dataset (what accuracy would a classifier achieve if it only predicted the most frequent class)?
* Split your dataset into a training and test dataset – if that is not already done for you.
  + If you want to optimize hyperparameters later on, you should also make a validation split.
  + If your dataset is very big or if any of the tasks take too long, take a smaller sample of your original dataset.
* Clean up your texts if necessary e.g. removing special characters.
* Preprocess your texts and choose and apply any feature representation (count matrix, TF-IDF, doc2vec, or any other that we did not discuss).
* Cluster the texts in your training and test dataset and show a silhouette plot (for both training and test) of the best clustering you could find.
* Classify the texts in your training and test dataset and show a confusion matrix of the predictions (for both training and test) of the best classifier you could find. **If your group consists of 3 people you are expected to try at least two different kinds of classifiers (e.g. naiveBayes and kNN).**
* Summarize your results. What worked and what didn’t work? (2 – 3 sentences is enough).
  + The performance of your classifier is not influencing the grading of this exercise ;-)

You are expected to hand in a jupyter notebook with at least minimal comments in either .ipynb or .html (preferred) format!

**Hand-in is due 16th of January 2023, 23:59;**

Points: \_\_/12