

Codebook Programming Tasks

1 Overview

1. Open the notebook *codebook_ex*.
2. Make yourself familiar with the created dataset.
3. Run the KMeans algorithm with different parametrizations.
4. Run the classification of the dataset. What do you observe? Can you explain it?

2 K-Means Algorithm

1. Open the notebook *codebook_ex_diy*.
2. Here, you will use the same dataset as in the overview task.
3. Complete the section with the helper functions. You will later use these functions to implement the k-means Algorithm. Test your functions before you go on to the next task.
4. Complete the *kmeans_custom* function.
5. Test your algorithm with the provided test section.

3 LBG-Algorithm

1. Continue in the notebook *codebook_ex_diy*.
2. Complete the *lgb_custom* function.
3. Test your algorithm with the provided test section. You may change both algorithm and dataset parameters (mean, variance, ...) to analyse the performance. Also compare to your own k-means algorithm.
4. In the template, the codebook size is doubled each iteration. What other options are there? Feel free to implement them.