# Week 5 – Clustering - DBSCAN (formative assignment)

In this assignment you will implement a clustering method, DBSCAN, efficiently in Python using numpy.

As part of the assignment you will create, as specified in the rubric (criterium 4 only):

1. *an original implementation of a simple machine learning model.*

Work out your answers to the assignment in the given Jupyter Notebook. Clearly separate natural text in Markdown cells (used for explanations, justifications, conclusions and reflections) from program code (used for analysis or visualisations).

### Assignment Description

Implementation the DBSCAN algorithm, step by step, as instructed in the notebook. The intended end result is a (reasonably) efficient implementation of the DBSCAN algorithm. The implementation allows the user to provide a (numerical) dataset with at least one row (sample / point) and at least one feature, and a value for both hyperparameters, and . The performance (speed) of the implementation needs to meet the levels mentioned in the notebook.

### Assignment deliverables

Please submit the following three components:

1. **Implementation**  
   Submit a compressed (zipped) folder containing your Python script or Jupyter notebook.
   * Do not include the dataset, output files generated in the script or your virtual environment.
   * If you have used a virtual environment, include a requirements.txt file listing all required libraries.

**Format**: .zip

1. **Printable Version of Your Code**

Provide a PDF version of your code (either notebooks or stand-alone scripts). This helps us offer detailed, line-by-line feedback.

1. Ensure code readability: use landscape orientation if needed to accommodate longer lines.

**Format**: .pdf

1. **Individual Contribution & AI Usage Report**

Write a short document addressing the following points:

1. **Individual Contribution**: Describe which parts of the assignment you completed and what responsibilities you took on.
2. **AI Usage**: Specify whether you used AI tools and, if so, how. Be transparent about the extent and purpose of any AI support.

**Format**:.pdf

### Important Notes

1. Before submitting your notebook, restart the kernel and run all cells to ensure it executes cleanly from top to bottom. Remove any error messages or irrelevant outputs.
2. As with all your written assignments, you may build upon external ideas (including those from chatbots or AI tools), provided you cite your sources. Use APA or IEEE referencing style.
3. AI usage must be clearly documented. You may use AI tools as a source of feedback or inspiration, but the final work **must** be your own.