**Lab instructions 3**

In this lab you will experiment with SOM.

Download the Banknote authentication dataset from the UCI repository.

It contains 1372, each with four features and one class label.

Read the data using pandas library.

Normalize the data since we will be using Euclidean distance to find the winning neuron and we know that data should be normalized whenever we use a distance-based measure.

Perform a train – test split i.e. set aside 30% of the samples for testing and use only 70% for training. The split between training and testing set should be random.

Recall that the samples are in a 4-dimensional feature space. We want to map them to a 2-dimensional space, preserving their topology, using an SOM. So, we train an SOM that has a 2-dimensional grid of neurons in the output layer. The number of neurons in the output layer is a hyperparameter that needs to be tuned.

Visualize the generated map. Start with 2x2 grid for the output layer and increase the grid size to 3x3, 4x4, … 10x10. Can you see a pattern in the resulting maps?