Banknote Authentication Problem

Learning from Data
Lab Task 2

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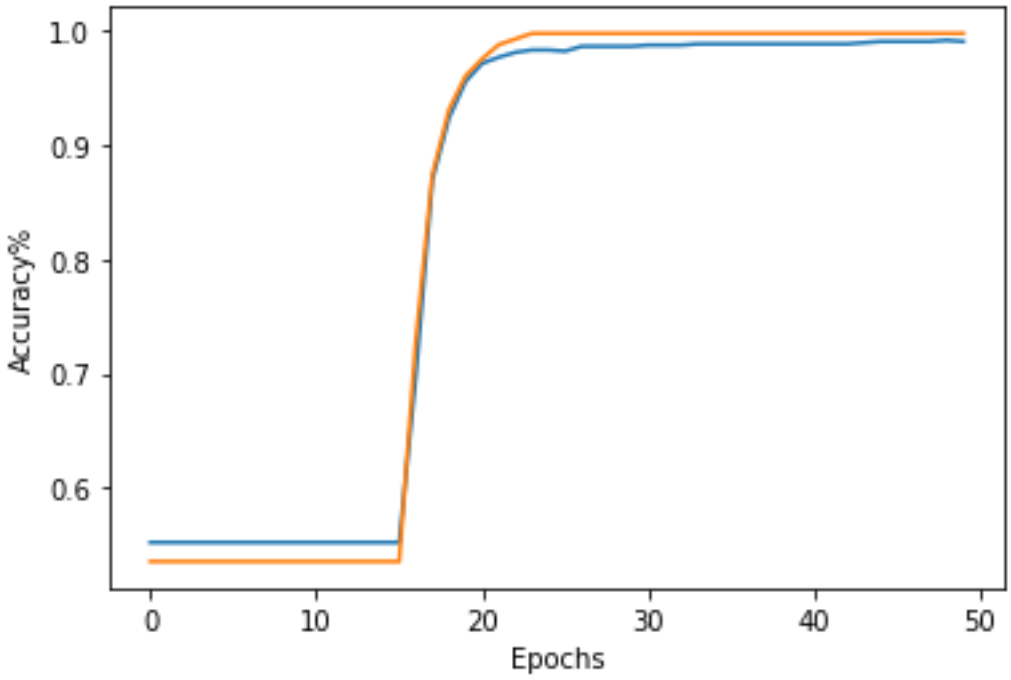
1. ML Structure design

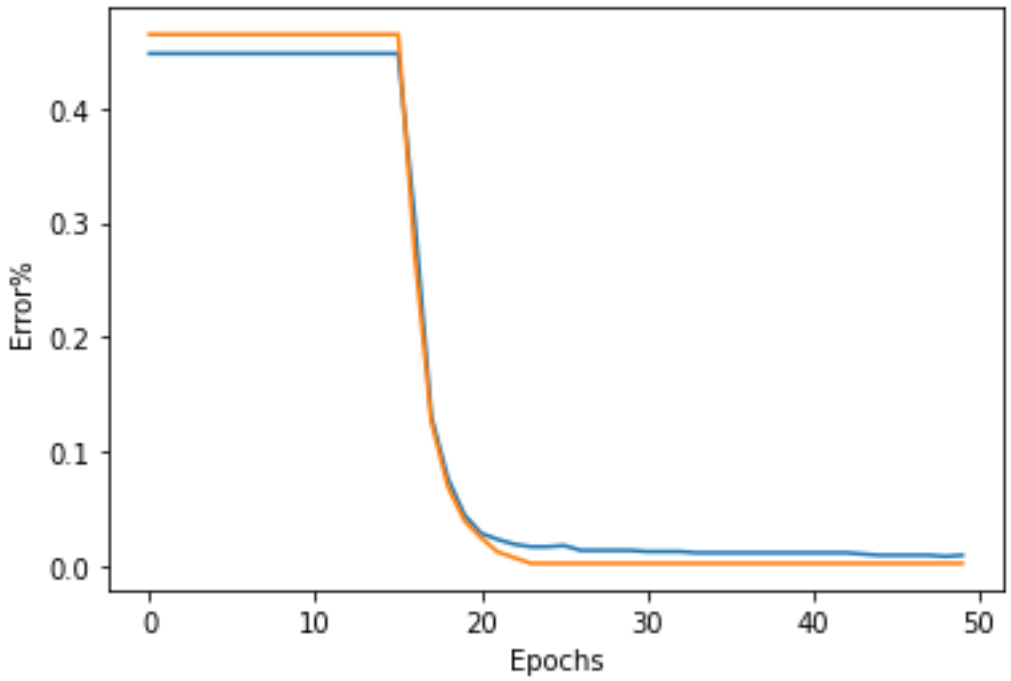
- We have 3 layers:
  Layer 1: contains 4 neurons.
  Layer 2: contains 4 neurons.
  Layer 3: contains 1 neurons.

- The activation function for each layer :
  'sigmoid' with kernel initializer 'uniform'.
- Initial set of weights:
  get_weights() built-in function returns the weights of the layer as a list of Numpy arrays in a uniform random values.

2. Experimental Design and analysis of the results

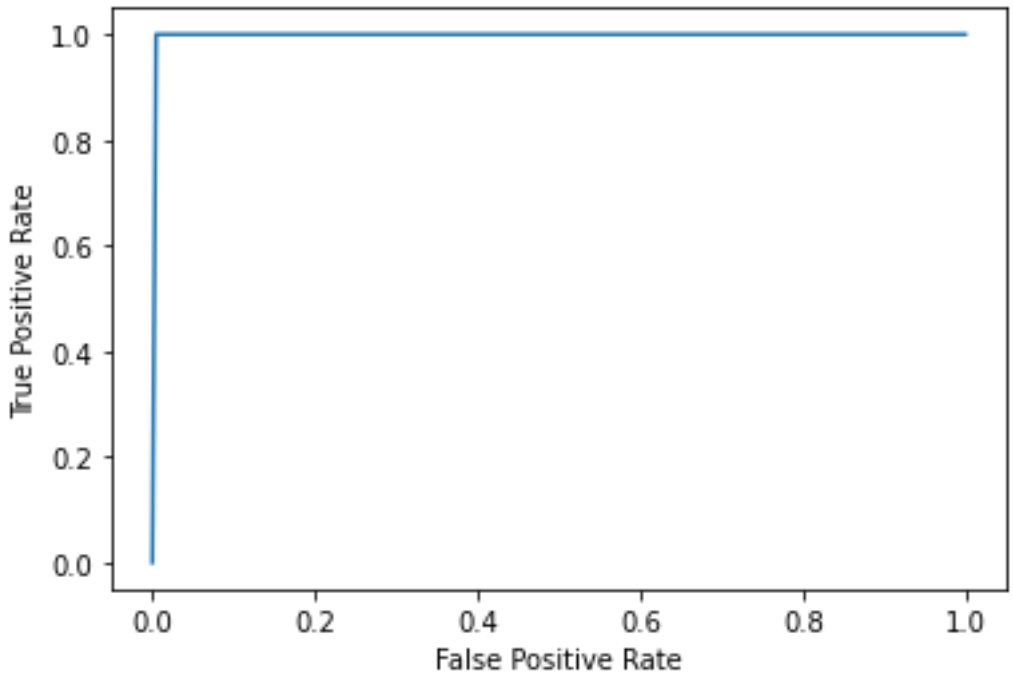
- With running 50 epochs of training on the training set. We got accuracy=99.75308641975309



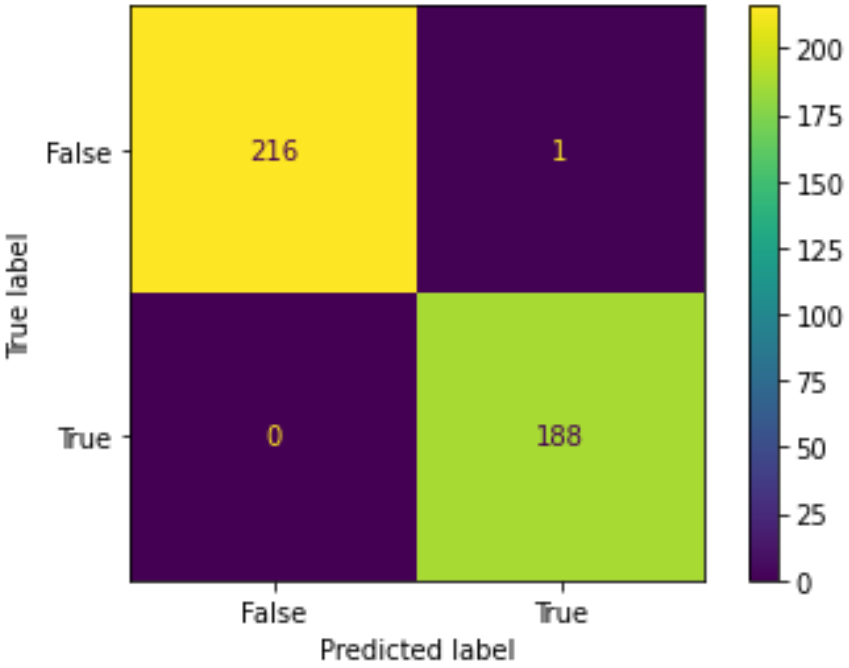


3. ROC curve and recommended the best weight

- The Multilayer neural network is better than Single layer neural network Because the dataset cannot be separated with a linear equation (one line) we need to spirit it with more than one line to get a good classification



- **the performance of a classification algorithm**.



- **Recommened the best weigths**

	precision	recall	f1-score	support
0	1.00	1.00	1.00	217
1	0.99	1.00	1.00	188
accuracy			1.00	405
macro avg	1.00	1.00	1.00	405
weighted avg	1.00	1.00	1.00	405