Assignment: CNN and MNIST

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1 Inspecting the data

The MNIST dataset contains 70,000 images of handwritten digits (zero to nine) that have been size-normalized and centered in a square grid of pixels. Each image is a $28 \times 28 \times 1$ array of floating-point numbers representing grayscale intensities ranging from 0 (black) to 1 (white). The target data consists of one-hot binary vectors of size 10, corresponding to the digit classification categories zero through nine. Figure 1 shows the data distribution for both training and test datasets.

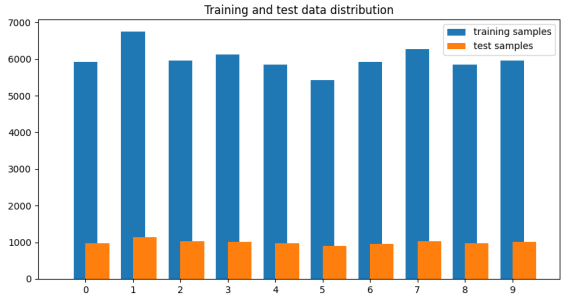

Figure 1: Histogram of the dataset

The training population presents a distribution with mean $\mu = 6\,000$ and standard deviation $\sigma \simeq 340$ and thus we didn't notice any important unbalance in the data.

2 Preparing the data

3 Building the network and training

3.1 Data split

3.2 Network