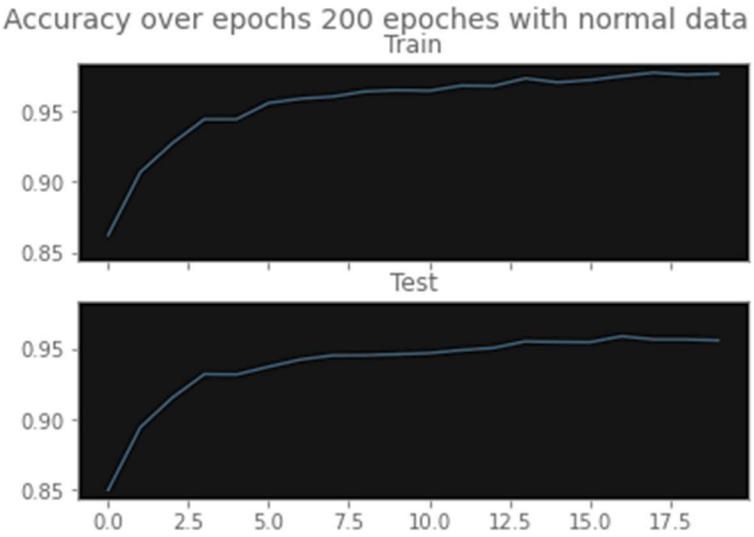
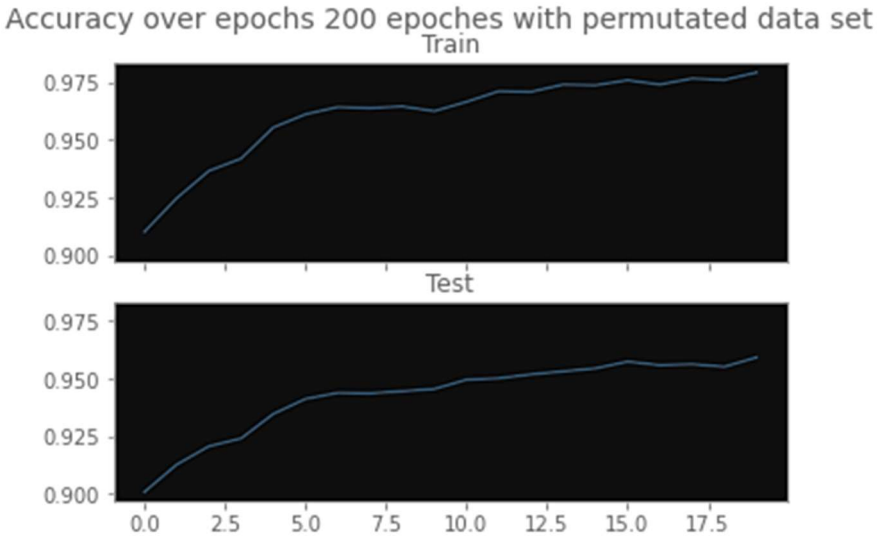
First Team Task (Permutated MNIST)

Comparing MLP with the normal and permutated set

First, we compare the accuracy of the MLP output with the two different sets. For this we use 100 neurons, learning rate 0.001 and 200 maximal iterations (divided in 20 times 10 iterations).

We acquire the following results:



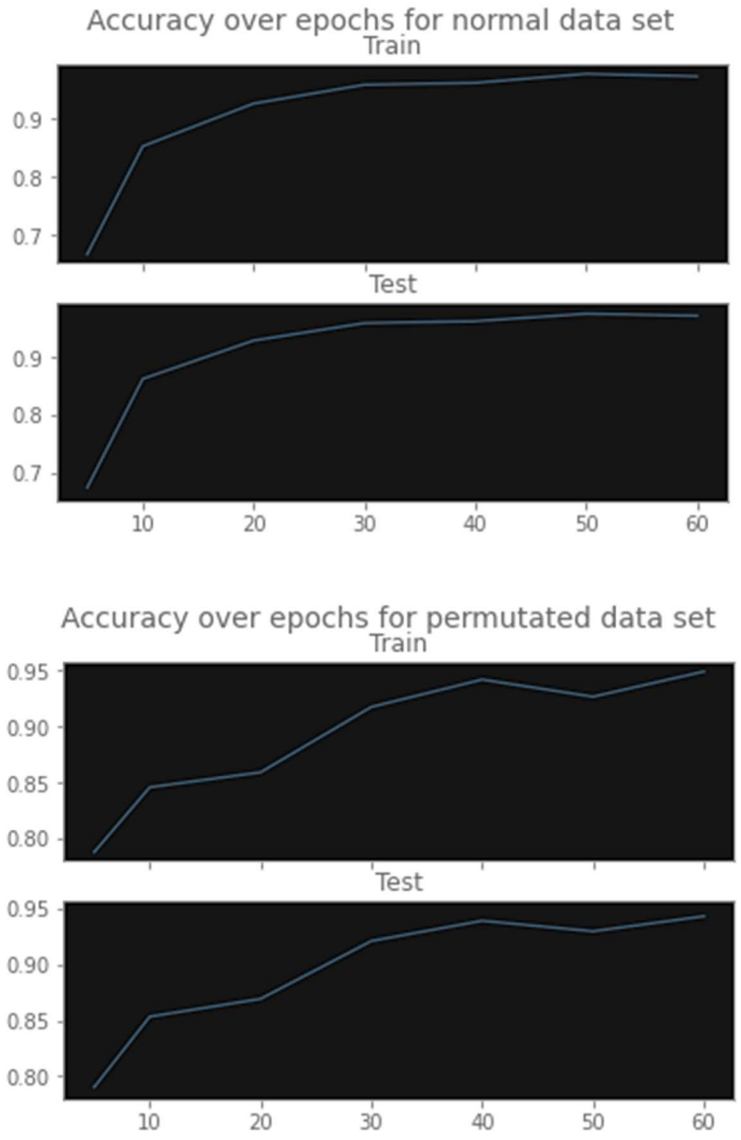


We see that the two are very similar, the accuracy is almost the same. This of course is expected, since MLP is permutation invariant and therefore should not be affected much by any permutations.

Comparing CNN with the normal and permutated set

For CNN we do have other expectations. Here during the convolution process the nearest neighborhoods are merged together, and therefore the process is not permutation invariant.

We get the following:



As expected, the curves are different. The CNN trained with the permutated set is less accurate, even though the difference smaller than we expected.