Assignment 2

Convolutional Neural Networks

Submission deadline: 25.05.2020

General Instructions:

- Submission via moodle, must include code (and all necessary files to run it) and a written report of no more than two pages long.
- Submission in pairs or solitary (include both participants info in written report)
- The code must be written in Python 3.6 or higher, and must run.

Assignment (Code):

1. Load the MNIST database into your workspace. Tip: You can use the code section from the last practical.
2. Separate the MNIST data into two datasets:
    a. First dataset, digits 0-6
    b. Second dataset, digits 7-9.
3. Train a CNN on the first dataset (0-6). We will refer to the model train in this item as the Base Model.
4. Fine tune the Base Model (in item 3) on the second dataset (digits 7-9). This is done by dividing your network into 3 parts:
    a. Initial layers: these layers have the same values from the training in item 3, and are **frozen**, which means they cannot be trained.
    b. Intermediate layers: these layers have the same values from the training in item 3, but they can be trained further.
    c. Final layers: These layers are initialized normally as if the training step had just begun. They should also be trained.

    Note: The CNN of item 4 should be in the same architecture of the Base Model
5. Train a fresh CNN on the second dataset

    Note: The CNN of item 5 should be in the same architecture of the Base Model

Assignment (Report):

Your report should include:

1. Plot your training and validation loss, and report training and test accuracy of the Base Model (item 3 in the code section)
2. Plot your training and validation loss, and report training and test accuracy of the model in item 4.
3. plot your training and validation loss, and report training and test accuracy of the model in item 5.
4. Compare your results from items 4 and 5 of the code section. Can a conclusion be drawn from your findings?
5. Compare the training time of item 4 and item 5 of the code section. Can you explain the difference?

Good luck!