TIES 4911 (2024): Guidelines for the Task 2

Your surname:
Your first name:

Study lecture materials… Refer to the examples in the materials to complete following sub-tasks:

Task 2-1: Compare performance (loss, accuracy, and examples of predictions of trained model) of several implementations for MNIST dataset classification mentioned in the lecture materials: *single-layer neural network and Multi-Layer Perceptron (MLP)* (at least in TF2, but if you what, you may also try TF1 version as well). But this time, use Fashion-MNIST dataset instead. Play with training hyper-parameters (e.g. network architecture, learning rates, optimizers, etc.) and compare performance… Present comparison results in a table (including corresponding hyper-parameters settings).

Task 2-2: Taking Iris dataset classification as an example, implement classification for some other similar dataset (find existing dataset). Play with data preprocessing, training hyper-parameters and network architecture to gain better performance (place corresponding settings and performance results into a table).

Task 2-3: Take Fashion-MNIST Classification example from the lecture materials and make a predictions of 5 input samples (on your chose) from the test set using simple "Single layer with 1 unit" and improved "Multiple layers" (with and without dropout) models. Use TensorBoard to detect possible overfitting. Visualize input images and show corresponding predicted categories (e.g. T-shirt, Trouser, Pullover, etc.)

Extra task for those who are aiming higher (optional):
Task 2-4 (extra): Implement classifier for XOR Gate.

Files to include in the demo results (archive file ties4911-task02-(*your_surname*).zip):

o *Task2-instructions.doc (this file)*

o *PPT presentation with (comparisons, corresponding screenshots, dataset examples, etc.)*

o *source codes (.py files, Jyputer Notebooks, etc.)*

Send the demo results as an archive to lecturer (oleksiy . khriyenko @ jyu . fi) before the deadline (end of 01.02.2024).

Be ready to present and comment your results during the Demo-2 Session. Be sure that you have all the necessary adapters to connect your computer in the classroom (if applicable).