Practice Exercise: Fashion MNIST

Q1. Consider the Fashion-MNIST dataset that contains Zalando's article images – consisting of a training set of $60,000$ examples and a test set of $10,000$ examples. Each example is a 28×28 grayscale image, associated with a label from 10 classes: (1) T-shirt/top, (2) Trouser, (3) Pullover, (4) Dress, (5) Coat, (6) Sandal, (7) Shirt, (8) Sneaker, (9) Bag, (10) Ankle boot. Fashion-MNIST is also available as a dataset within the collection of built-in datasets of PyTorch; please check `datasets.FashionMNIST`. Using PyTorch, train a neural network with three hidden layers each with 2048 hidden units, with `nn.ReLU` and `nn.Dropout` layers that can learn to classify the images from the Fashion-MNIST dataset.

(a) Plot the confusion matrix.

(b) Plot 10 correctly classified examples and 10 incorrectly classified examples.

(c) Compute class-wise accuracy.

Hint: Please have a look on the neural network classifier implemented for learning a multi-class classifier for the MNIST dataset in Workshop 3: Neural Network Tutorial.