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# Assignment 3

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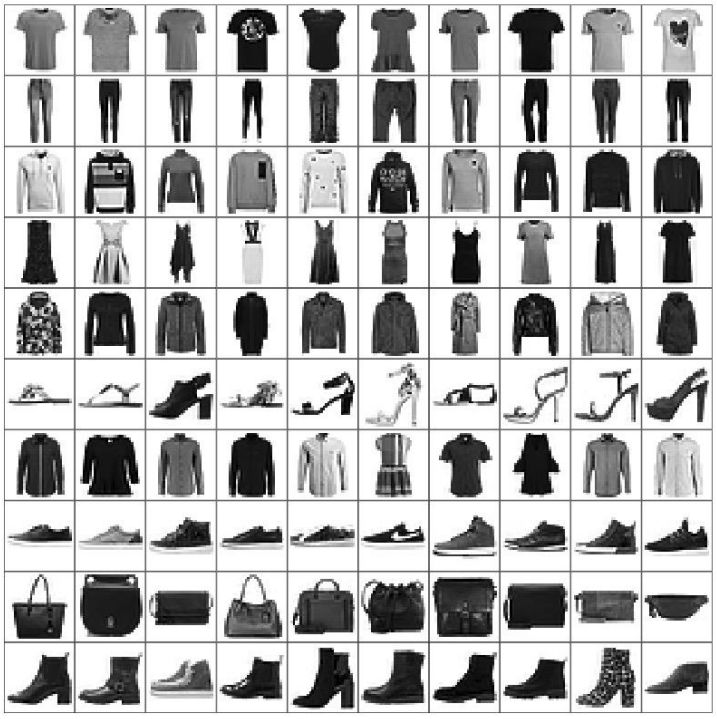
## Instructions

1. Assignments should be submitted electronically, as MS Word, PDF document or Jupyter notebook containing text and embedded graphics. Label each plot, chart or table, add detailed title and reference it in your text (i.e. “Figure 1 shows … “). The document can be written in English or Hebrew.
2. Submitted report, code and data files should be zipped into a single file and uploaded to Moodle. Do not include the data provided to you as part of this assignment.
3. The deadline is firm. Late submissions will not be allowed.

Good luck

1) (50%) Zalando is a multinational e-commerce platform selling fashion goods in many European countries. It released a Fashion MNIST dataset – a set of (60,000 train + 10,000 test, stored in *fashion-mnist_train.zip* and *fashion-mnist_test.zip*) images of 10 types of clothes.

| | |
|---|---|
| 0 | T-shirt/top |
| 1 | Trouser |
| 2 | Pullover |
| 3 | Dress |
| 4 | Coat |
| 5 | Sandal |
| 6 | Shirt |
| 7 | Sneaker |
| 8 | Bag |
| 9 | Ankle boot |



a. Train fully connected neural network with few hidden layers to classify images in Fashion MNIST dataset.
b. "Play" with the number of the hidden layers and size of each layer. For each case, measure:
    i. The total number of network parameters
    ii. The network accuracy on the training and validation set (for each batch).
    iii. Training and inference times.

    What can you learn from these experiments? Can they help you choose the best model? Use the data you have collected to support your answers. You are encouraged to use plots to make your arguments easier to convey.

c. Test performance of the model of your choice using the test set. Compute confusion matrix.

2. (50%) Your task is to train a sentiment analysis model that would be able to infer sentiment of a tweet. The file 'tweet_sentiment.csv' contains 1.4M tweets classified into positive (1) and negative (-1)

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sentiment (polarity). The file ‘tweet_sentiment_test.csv’ contains a sample of 320K tweets without sentiment (polarity=0).

You are asked to train and test your model using ‘tweet_sentiment.csv’ data only. Once you feel confident, compute polarity for the tweets in ‘tweet_sentiment_test.csv’.

Submit:

1. Your predictions for the tweets in the ‘tweet_sentiment_test.csv’ file. The file you submit should be named ‘sentiment_{id}.csv’ where id stands for your teudat zehut number. It should contain a header and two columns: ‘tweet_id’ and ‘polarity’, with polarity values being either 1 or -1.
2. Report the accuracy you’d expect from your model.
3. Also submit your Jupiter notebook.