**Lab 2 Assignment, ECE 614, Spring 2021 - Due date Friday, 3/12/2020**

**This Assignment is done in groups of two students, one submission with two names**

Build a multilayer perceptron-based classifier model for the Fashion-MNIST Image Dataset. Utilize/start from the LAB 2 coding and modify it according to the tasks below. The data source is <https://github.com/zalandoresearch/fashion-mnist>. To become more familiar with the data, accessing and checking this paper will be helpful: [https://arxiv.org/pdf/1708.07747.pdf](https://nam03.safelinks.protection.outlook.com/?url=https%3A%2F%2Farxiv.org%2Fpdf%2F1708.07747.pdf&data=02%7C01%7Cjacek.zurada%40louisville.edu%7Ccabec7296dfe46fbe5fe08d7b92cd5d8%7Cdd246e4a54344e158ae391ad9797b209%7C0%7C0%7C637181475136000503&sdata=ozhpN89mkYzGUQvtzDMNTzAP51BfqAwsThyIYEpaX00%3D&reserved=0)

Review the data first. Use categorical cross entropy for training on 60k data pairs, setting aside 10k pairs for testing, monitor the loss function and accuracy. As this is a more challenging data than in any tasks tried before (incl. digit MNIST data), perform modeling attempts with different architectures and with 10 Softmax output neurons and try the tasks below to achieve the best accuracy.

**Tasks:**

1. Try several architectures, use RELUs and linear layer(s)
2. Explore various learning and momentum constants
3. Explore L2 and L1 regularizations
4. Check if other Keras options (like Dropout or Optimizers) would help for your best models

**Report through BB in the doc or docx format with Report Tables and graphs neatly arranged, sequenced and commented properly for best grade grade.**