Homework4, Due Date: Fri, May 10

Instructor: Dr. Mohammad Pourhomayoun

Write and submit your python codes in "Jupyter Notebook" to perform the following tasks. Make sure to provide proper descriptions as MarkDown for each section of your code.

Fashion Image Recognition using Deep Convolutional Neural Networks:

In this question, we try to improve the accuracy of the Fashion Image Recognition system that we developed in the class in Lab5. Download and open the Lab5 ipython tutorial file (it is on CSNS under Lectures). Add the following lines on the top of your code to fix random seed for reproducibility:

```
import numpy as np
np.random.seed(0)
```

Now, Modify the CNN structure and parameters to increase the testing accuracy as much as you can, but I expect **At LEAST 92% Accuracy on the TESTING Set**.

I want you to be creative and use all knowledge you have gained from this class to improve the results (don't change the dataset, you can only change the CNN structure or learning parameters). Here are some ideas that you may want to use:

1- Changing the structure or parameters of the CNN including all layers (Conv Layers, Pooling layers, Dropout Layers, Fully Connected Layers, …).
2- Making the Network more complex (when it is underfit), or less complex (when it is overfit).
3- Improve the training process (e.g. changing the epochs, changing the optimization or loss)

Please Notice:

I- Of course there are infinite number ways to change the code to improve the results. Thus, I expect to receive a Unique code from each student.

II- You need to do a lot of Trial & Error. That is why I decided to use the Fashion Dataset since it includes small grayscale images, and everyone can process that on personal laptops. However, make sure to start early enough!

III- One student, who achieves the highest accuracy in the class (the winning student), will get 10% bonus on the overall grade of the course!