CS422/622- HW 5

In HW5, we are going to implement a convolutional neural network for the handwritten digit classification problem with the MNIST data. Please use the same MNIST data with HW4 that includes 100 images on each label of 0 – 9.

You should implement a neural network (NN), compute accuracy using 5-fold CV. You can design the network by yourself. You must clearly explain the architecture of your neural network. You can implement the neural network using any deep learning frameworks (e.g., keras, pytorch, tensorflow)

[Additional Task for CS622]

Task 2: You should implement a convolutional neural network (CNN) and compare the performance with the accuracy of NN. You can design the network by yourself. You must clearly explain the architecture of your convolutional neural network. You can implement the convolutional neural network using any deep learning frameworks (e.g., keras, pytorch, tensorflow)

Submission:

You must submit the followings to WebCampus:

1. MS word file
   - Describe what you have done for the homework assignment.
   - Elucidate and justify your network design and hyper-parameters. (e.g., filter size, filter numbers, pooling, # of layers, # of nodes on each layer, choice of activation functions on each layer, cost function, learning rate, optimizer, and so on)
   - MUST include a Learning curve (from an experiment)
   - MUST include five accuracy and their average.
   - Compare the averaged accuracy of CNN with of NN.
2. Source code file(s)
   - Must be well organized (comments, indentation, …)
   - You need to upload the "original python file (*.py)" after changing to "*.py.txt". For example, "*.py" to "*.py.txt"

You must submit the files SEPERATELY. DO NOT compress into a ZIP file. If you fail to provide all required information or files, you may be given zero score without grading.

Once you submit, Webcampus will perform similarity check for your submission and show you the result. Your similarity score must be lower than 50% unless something essential is described in the report. Otherwise, (the score -50%) will be deducted. Detecting any attempts to bypass the similarity check may result in receiving zero points.