**Hands-on Assignment 2**

Due Date: See Web

(For students choosing Option 1 only. HA1 and HA2 are mutually exclusive.)

**Objective:** The “programming-assignment2.py” file contains a program for learning a two-layer neural network on the iris dataset (included). The first layer is a hidden layer using ReLU as the activation function, and the second is the output layer that outputs the probability distribution of the classification result with Softmax.

In the program, there is a function, ***compute\_neural\_net\_loss***, for calculating the cross-entropy loss with regularization and its gradient w.r.t the parameters of the neural network. It is designed to apply the forward propagation to derive the loss and the backward propagation to give the gradient. They are left out. In this assignment, you are asked to finish this function. (Note that you usually do not need to code backpropagation when writing deep learning programs. You can do it by simply calling the backward() method in Pytorch. See Tutorial 2 for an example. )

When you run your finished program, it should print out something like the following:

Epoch 0: loss = 1.10, train\_acc = 0.3500, test\_acc = 0.2667   
Epoch 10: loss = 0.72, train\_acc = 0.7000, test\_acc = 0.5333   
Epoch 20: loss = 0.32, train\_acc = 0.8583, test\_acc = 0.8000

…

The numbers might be different due to randomness in parameter initialization and data batching.

The TA will test-run your code. The grading will be based on correctness of program and clarity of code structure, variable names and comments. Code conciseness will also be considered.

**Notes**:

1. **Submission format**: A single zip file with your .py file(s). No need to include the dataset. The zip file should be named Student\_ID\_Assign#.zip, i.e. 1234567\_Assign2.zip. Include a README.md file for any general comment and / or online reference used.
2. **headers:** Add the following headers at the beginning of your submission code:

"""

Student Name:

Student ID:

Student Email:

"""

1. **Comments:** If your variable / function name is not self-explanatory, please add a comment

i.e. zn1 = np.argmax(score, axis=1)   #zn1 is my network output prediction

1. Make sure to use Python3 instead of Python2
2. Do not use additional libraries other than those imported in the given code.
3. If you need help or made mistakes on submission, please email TAs directly.
4. Similarity penalty will not be applied to this assignment. However, the Turnitin report will be used as clues for manual plagiarism detection.

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