

CS212 Topics in Computing 2 2019, Term 2 Second Half: Lab 3

Weights in your Mark

Details can be found in Lab 2. This assignment is 5% worth of your cs212 mark.

Assessment & Submission

The report for this lab assignment with your screenshots needs to be uploaded to myPlace before 12pm on Monday March 18th as a single PDF file. Get in touch with the lecturer ASAP if you are unable to meet those requirements due to your individual circumstances or technical glitches on our lab computers.

You can work on this assignment in the groups of your choice no larger than 3 students. But make sure everyone retains the copy of the code and uploads the report, which will be marked individually. You don't need to state the names of the students in the group.

Assessment Criteria

See lab 1.

Instructions

Task 1. (50%)

Using our Lecture 4 slides as guidance, combine your code from Lab 2 that can train a perceptron with your code that can work with MNIST images to create a program that can learn to tell between the two groups of digits {0,1,2,3,4} and {5,6,7,8,9}. Use the files *train.txt* and *test.txt* for training and testing accordingly. The format of your output should look similar to slide 12. It is sufficient to obtain any performance better than 50% (random guessing) on the test set. Take the screenshots covering your code and your output and add them to your report.

Task 2. (25%)

Using slides 20-23, verify that the training set and testing set do not have any images in common (no "memorization" effect). Include a screenshot similar to slide 22 in your report.

Task 3. (25%)

Add a bias to your model implemented in Task 1 if it already does not have one. Compare the performances with and without the bias. You can vary other parameters such as learning rate, number of epochs, etc. Which one do you think works better? State your answer in no more than 300 words.