4105931 機器學習

Assignment #1 – **Perceptron**
Deadline : 2023/3/28 11:59 pm

1. Use line equation y=mx+*b* with particular parameters *m* and *b* to randomly generate 30 2D data samples. 15 samples in the right of the line are marked as positive samples and the others in the left are used as negative samples. No samples on the line.
2. Implement **Perceptron Learning Algorithm** with your own initial w_0. Discuss if your PLA halts or how many iterations it halts. Generate the data samples three times and calculate the average number of iterations when PLA halts.
3. In Problem 1, generating 1000 positive samples and 1000 negative samples. Implement Pocket Algorithm and compare the execution time to PLA on the same dataset.
4. In Problem 3, mislabel 50 positive and 50 negative samples by incorrect label. Report the accuracy of Pocket Algorithm by this setting and the setting in Problem 3.

Note:
• The assignment should be implemented by Python.
• You need to hand in the python code and the report.
• In your report, it should contain: (請以中文撰寫)
• **Execution description**: steps how to execute your codes.
• **Experimental results**: As specified in the assignment.
• **Conclusion**: The observation from your results.
• **Discussion**: The questions or the difficulties you met during the implementation.
• Assignment format
    • Zip all your files into a single one and upload it to the E-Course2 website.
• Please format the file name as: Student ID_proj1_verNo, ex：602410143_proj1_v1 • No copy! Late policy applies.