Lab-3 (Perceptron)
CSL7670 - Fundamentals of Machine Learning

NOTE:

1. This assignment contains 2 problems. Please go through the references carefully before starting the lab assignment.
2. Objective of this assignment is to gain familiarity with perceptron.
3. Submit a brief report in the lab report template that is already shared.
4. **Deadline:** August 29, 2023, 10:30 PM.

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1. **(Playing with Perceptron)** You are given a code for perceptron. Please modify it so that (a) It works for labels given as (+1,-1).

   (b) it works for the data provided in the attached CSV file. For create a CSV file with three features and two classes manually. Read this CSV file and executive the Perceptron code.

2. **(Handwritten problem)** The following training samples are given:

x_1	x_2	Class
1	1	+1
-1	-1	-1
0	0.5	-1
0.1	0.5	-1
0.2	0.2	+1
0.9	0.5	+1

Table 1: Sample data

Assuming weight vector of initial decision boundary $\mathbf{w}^T\mathbf{x} = 0$ as w=[1, 1], solve the following:

(a) In how many steps perception learning algorithm will converge?

(b) What will be the final decision boundary? Show step-wise-step update of the weight vector using computation and the hand-drawn plot. (Submit the handwritten solution before the beginning of Monday's class).

End of Paper