ECE 50024

Homework 3

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## Exercise 1:

Chart, line chart

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* 1. If the two classes of data are linearly separable, then with increasing iterations, the sigmoid function would tend to a step curve.

As the angle of w would tend to and hence of slope of would tend closer to Consequently, the transition of the sigmoid hyperplane would tend closer and closer to be parallel to the y-axis, resulting in the y-intercept to tend to

* 1. If we restrict and , then the iterations would stop after some finite number, causing the algorithm to converge. We can also counter non-convergence by:
     1. Stopping the algorithm by a finite number of iterations
     2. Applying a threshold on the maximum permissible error
     3. Adding a regularization term to penalize

* 1. No, conversely, linear separability promotes convergence for linear-classifiers and convex problems, as in such cases, an analytical solution exists that can derive the optimal in a singular step.

## Exercise 2:

Text

Description automatically generated with low confidence

Theta is given by:

Background pattern

Description automatically generatedChart, scatter chart

Description automatically generated

## Exercise 3:

Text

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A picture containing chart

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Alpha is given by:

Chart, scatter chart

Description automatically generated

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# APPENDIX