Machine Learning 2
Exercise Sheet 6

Prof. Dr. Dr. Lars Schmidt-Thieme, Nicolas Schilling
Information Systems and Machine Learning Lab
University of Hildesheim

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Exercise 10: Boosting of Linear Models (6 Points)

a) Derive the parameter updates for boosting a linear regression model optimized for least-squares loss using Stochastic Gradient Descent.

b) Derive the parameter updates for boosting a logistic regression model optimized for exponential loss using Stochastic Gradient Descent.

c) For features $x \in [0, 2]$ create some toy data using:

$$y(x) = -1 + 2x + \mathcal{N}(0, 0.5)$$

Learn a linear regression using the closed form solution. Then, boost it with another linear regression also with the closed form solution. Explain what happens.

Exercise 11: AdaBoost in R (4 Points)

Install the package 'adabag' in R. Check the 'biopsy' data set in R, remove the 'ID' column and then split the data into 70% Training and 30% Testing Data. Use AdaBoost of adabag with an ensemble of 10 models and print the resulting test accuracy.