Homework 2

For this homework you will build your own ML models using the Perceptron and Adaline algorithms. Please implement your own version of the Perceptron algorithm and compare it to the text book implementation (available via the author's github site). You can also implement your own version of Adaline, but it is perfectly acceptable to use the author's (or any other) implementation.

Once you have the implementations ready:

1. Create your own dataset (at least 10 examples) that is linearly separable. Now train a Perceptron model. Provide evidence that Perceptron found a decision boundary. [undergrads: 25 points; grads: 20 points]
2. Create your own small dataset (at least 10 examples) that is *not* linearly seperable. Now train a Perceptron model. Did the algorithm converge? Provide evidence. [undergrads: 25 points; grads: 20 points]
3. Download the Titanic dataset and randomly split it into training (70%) and test (30%) sets. Train an Adaline model using the training data. Now evaluate it on your test data. Please report your performance. You are free to use either the SGD or the batch version of Adaline. [40 points]
4. What were the most predictive features of your Titanic model? Provide evidence. [undergrads: 10 points; grads: 20 points]

Please submit via Sakai (1) a report addressing the questions in each problem, and (2) your code and datasets you created. Please see the general guidelines for homework submission in the syllabus.

Good luck!