Brandon Toops, Patrick Phillips, Qingjie Lu

Project 4 – Learning Report

Instructions to get data:

Run each class with the graph header names to get the data. The output should show up in a text file “Output[headerName]”.txt. Copy the data into the respective sheet on the excel document to get a graph of the data. The output.txt files are located in src\learn\lc\examples

Description:

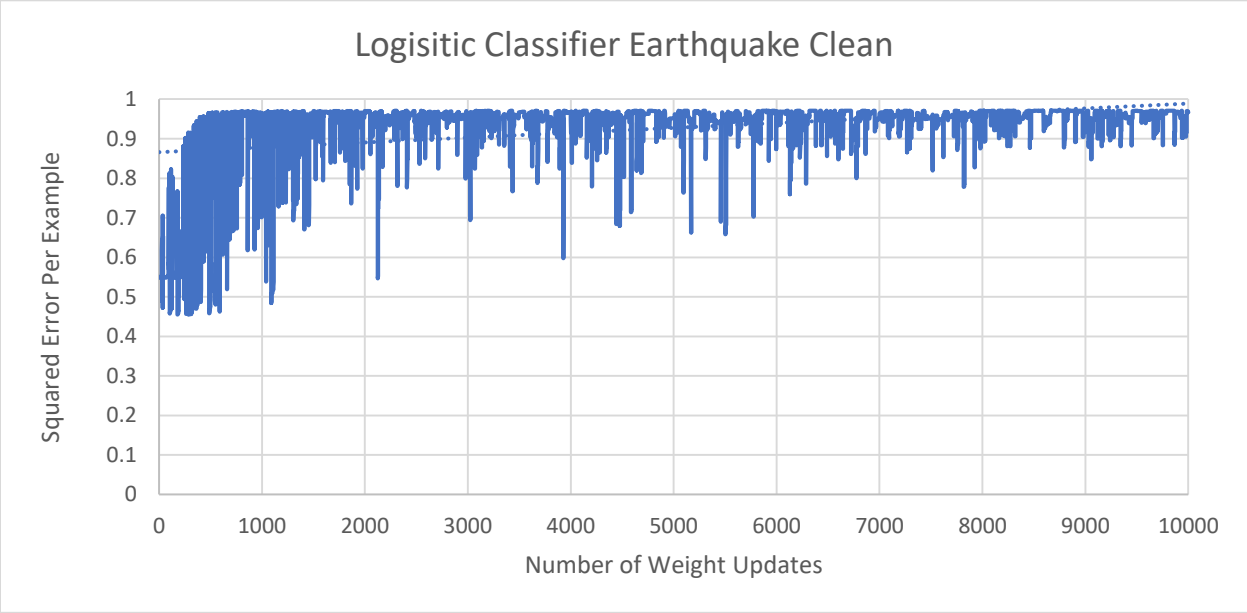
Implemented the sigmoid threshold and update function for the logistic classifier and the hard threshold and update function for the perceptron classifier. Also attempted to implement the Neural Network, however it does not calculate the correct probabilities. It calculates the correct delta[j] and does update the weights though, but the calculated delta[i] is wrong and I can’t for the life of me figure it out. =(

Summary:

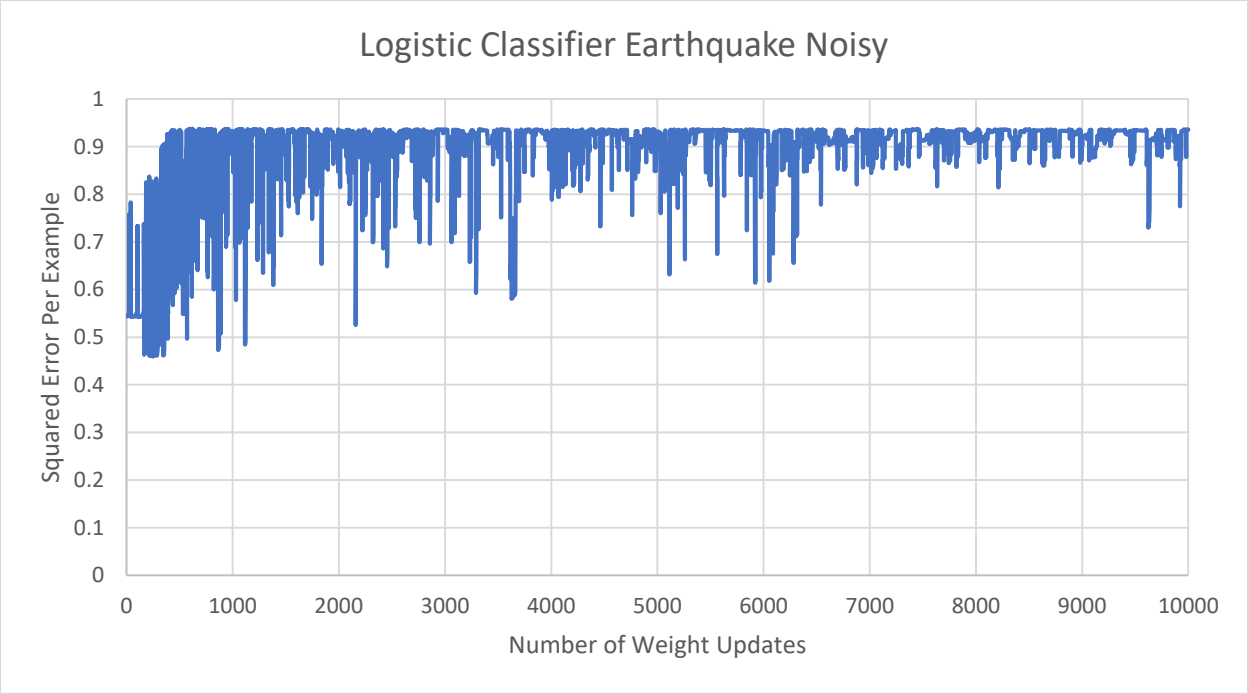
In general, we found that the logistic classifiers have less variability in their learning curves, with a decaying alpha having the minimum loss. For perceptron classifiers, noisy decaying in general produced a training curve with less variability. The reasons for the large jumps (and high variability) in the perceptron classifiers was due to the hard threshold of 0 or 1 while the logistic classifiers used a soft sigmoid threshold with values between 0 and 1. Overall, the logistic classifiers appear to be a more accurate way of learning.

Graphs:

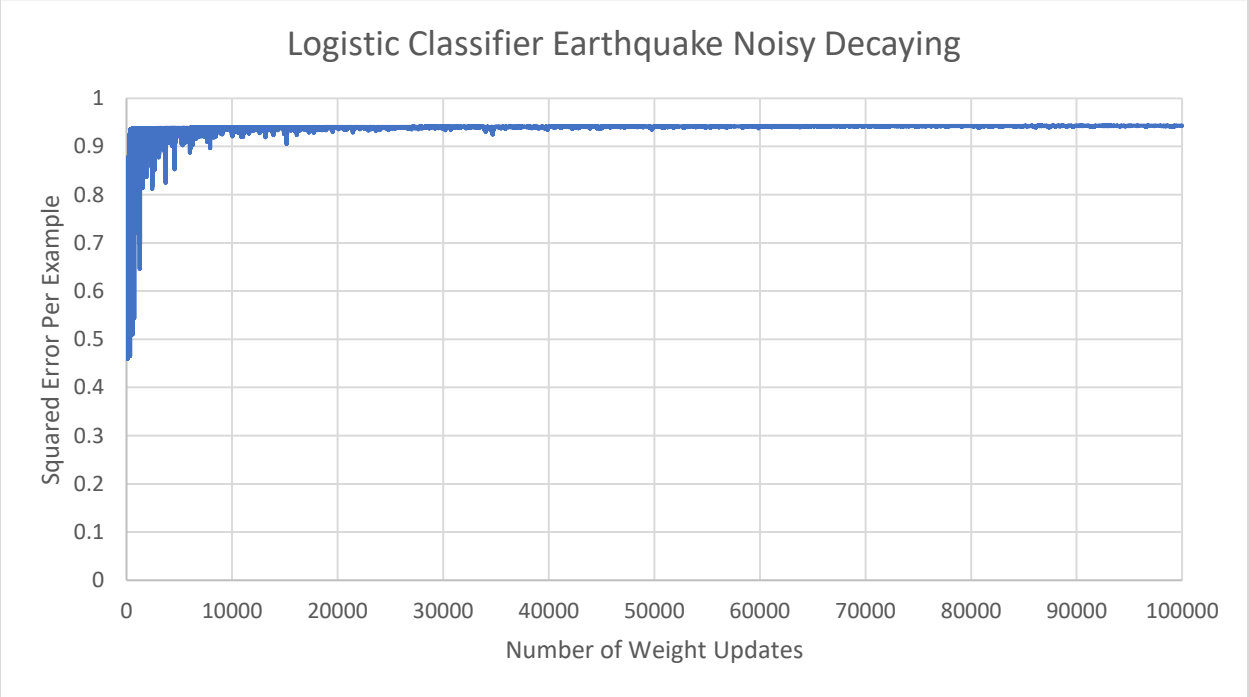
Logistic Classifier Earthquake Clean



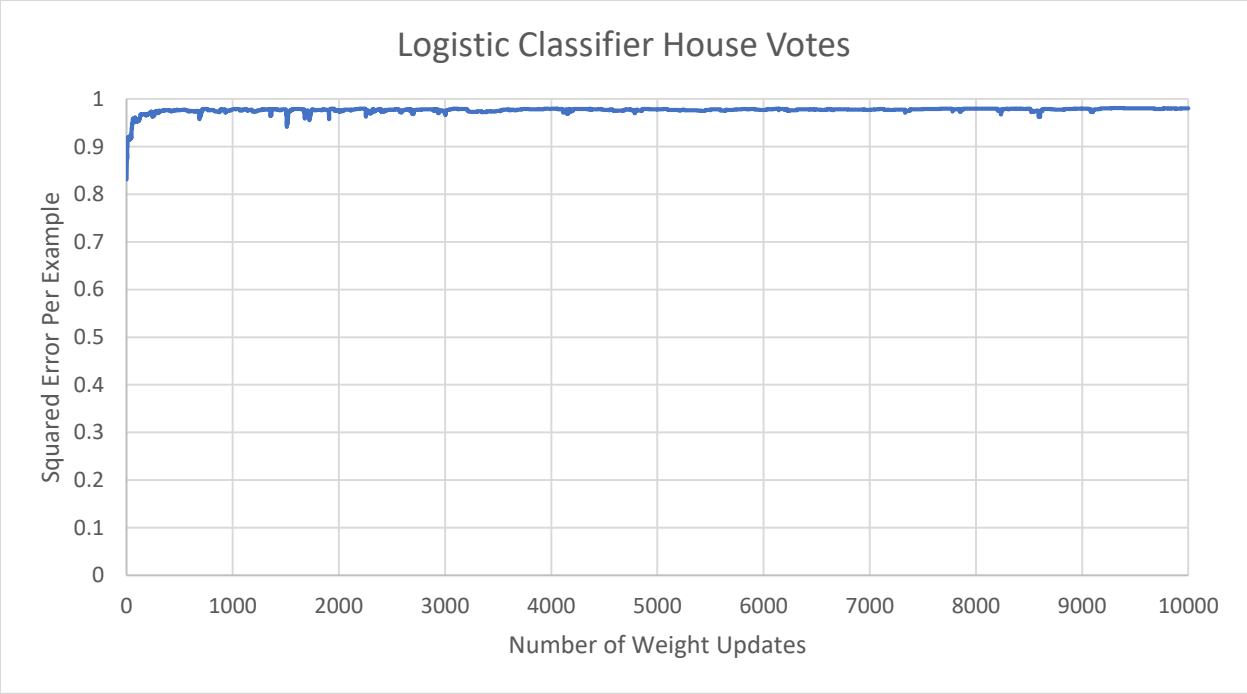
Logistic Classifier Earthquake Noisy



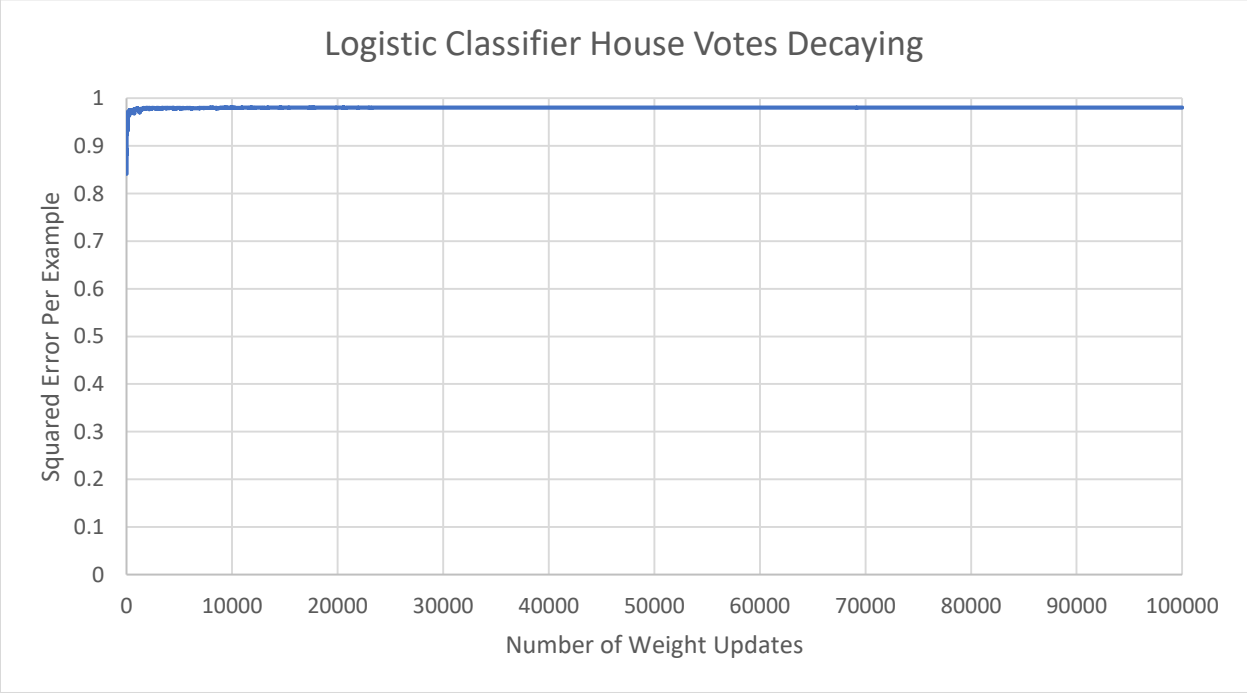

Logistic Classifier Earthquake Noisy Decaying



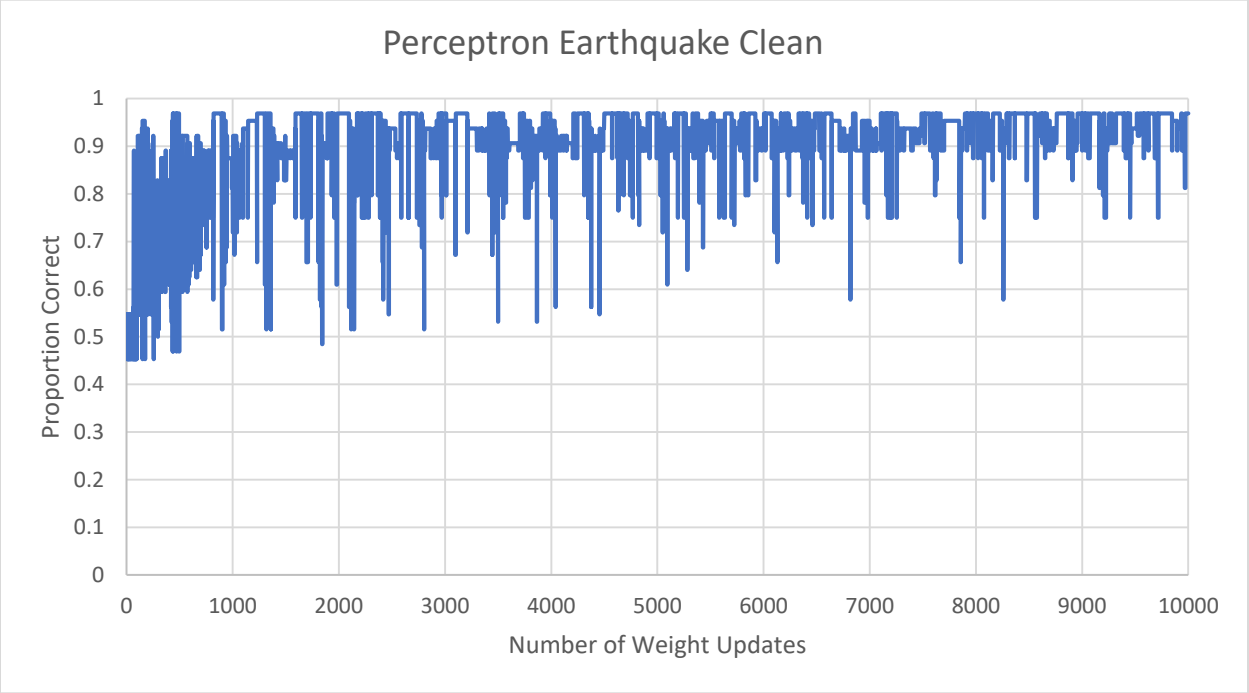
Logistic Classifier House Votes



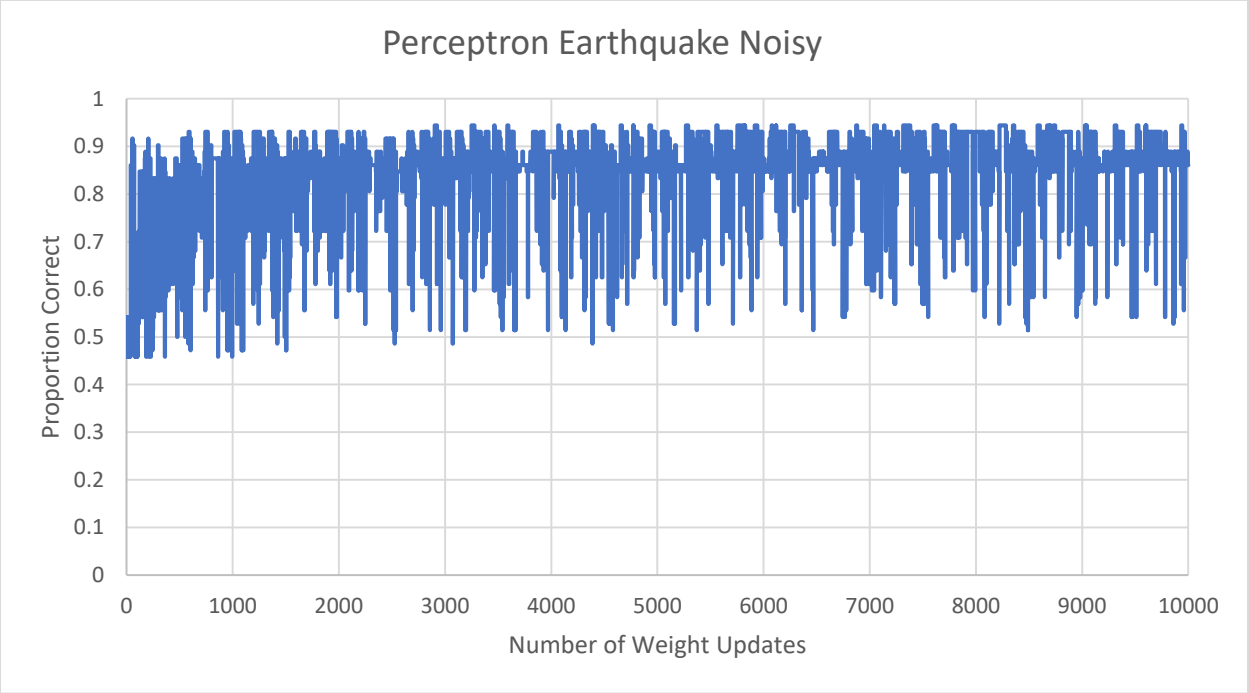

Logistic Classifier House Votes Decaying



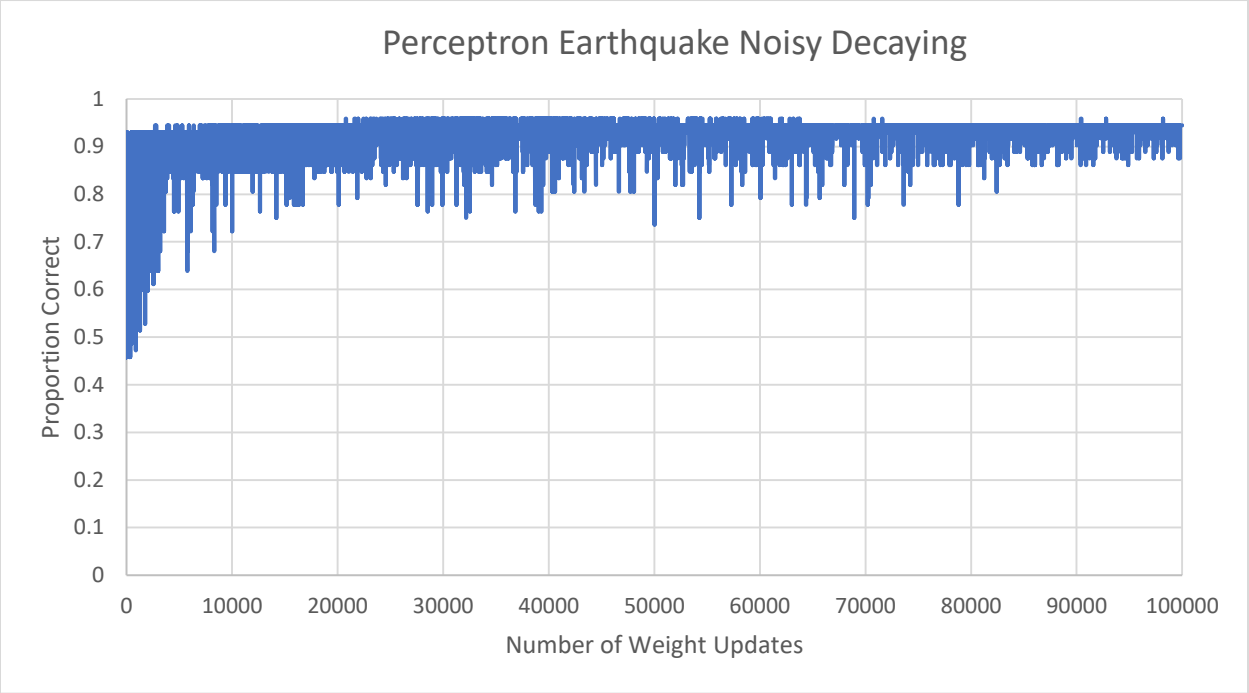
Perceptron Classifier Earthquake Clean



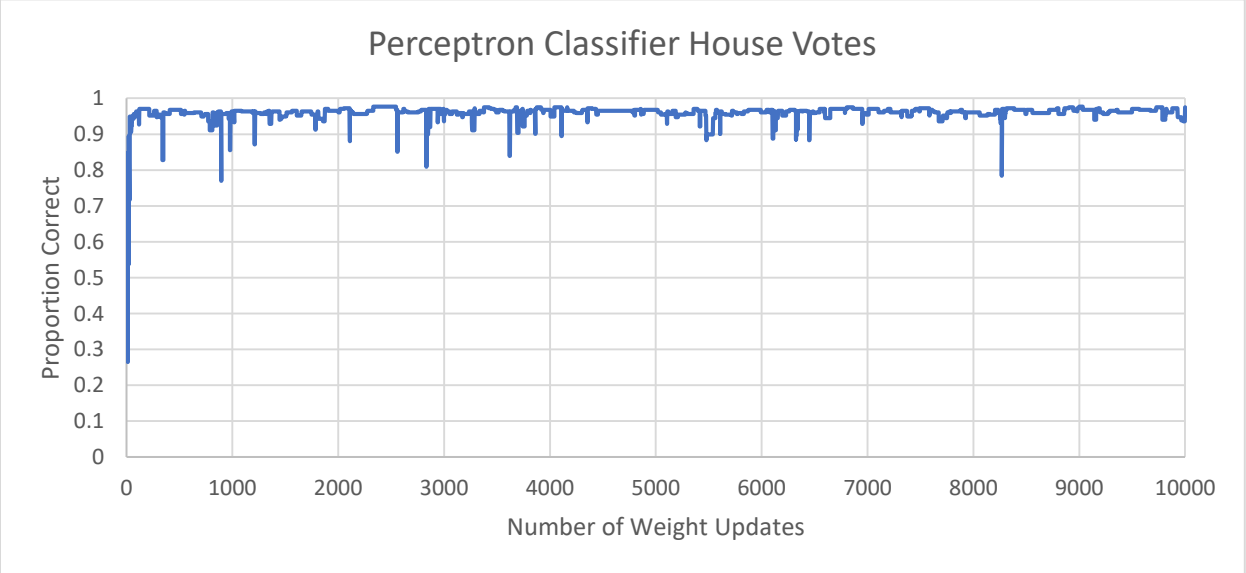

Perceptron Classifier Earthquake Noisy



Perceptron Classifier Earthquake Noisy Decaying




Perceptron Classifier House Votes



Perceptron Classifier House Votes Noisy Decaying