HW 2 Write Up

1. This assignment was written in R. I decided to start a package I could use going forward with any other assignments. I also decided to write the main perceptron function such that all I have to do is to pass different parameters for the different versions of the function. I took the time to write a generalized cross-validation function so I can pass any algorithm and run cross validation. R makes data representation easy, I use a mix of data frames, lists and numeric matrices.
   1. One comment here, I think something may be a little messed up as the accuracy doesn’t strictly improve after each epoch. I’m not sure what is going on there, it merits more time than I have right now to figure out.
2. + 1 is the most common label in the response data set. In that case we would see 57% accuracy in the test set and 54.9% in the dev set.
3. As follows
   1. Simple Perceptron
      1. Best hyper-parameters: r = 0.1
      2. Avg of 91.3%
      3. I didn’t save the number of updates and am too late to run through it all again.
      4. 91.3%
      5. Test set was used for cross-validation tests. See (ii)
      6. Image below.
   2. Dynamic Perceptron
      1. r = 1
      2. 92.3%
      3. same as (a)
      4. 90.8%
      5. same as ii (test set used for cross-validation)
      6. image below.
   3. Margin Perceptron
      1. r = 1, mu = 1
      2. 93.3%
      3. same as (a)
      4. 91.3%
      5. same as ii
      6. image below
   4. Averaged Perceptron
      1. r = 1
      2. 92.8%
      3. same as (a)
      4. 91.0%
      5. same as ii
      6. image below







