CSCI4155/CSCI6505: Assignment 1

Assignments must be submitted on paper at the beginning of next class, September 22, or left in my mailbox (talk to Barbara at the front desk in the CS building). Late submissions are not accepted.

1. In this assignment you should practice working with Matlab. To do this, write a matlab program that regresses linear data. The 10 training data $x^{(i)}, i = 1, ..., 10$ should be generated with the following code

```
x=rand(1,10);
y=0.5*x+1+0.1*randn(size(x));
```

To do the regression you should use an update rule for the slope parameter m and the offset parameter b which is given by

$$m \quad \leftarrow \quad m + 0.1 \sum_i (y^{(i)} - mx^{(i)} - b)x^{(i)} \tag{1}$$

$$b \quad \leftarrow \quad b + 0.1 \sum_i (y^{(i)} - mx^{(i)} - b) \tag{2}$$

The program should plot two graphs. The first one should show the data points and the final regression line. The second graph should shows the development of the relative mean square error (scaled so that the maximum value of the error over iterations is 1) and the evolution of the parameter values for m and b.

The program is only allowed to have one explicit loop in the program over the iteration of the update rule in equations (1) and (2). The rest of the code should only use references to the whole data arrays.

You must submit your assignment on paper (I will try to plant another tree) before class on Sept 22. Late assignments are not accepted. Your submission must include your code and the two graphs in a reasonably readable form (including axis labels), and everything has to fit on a single page that includes your name and Banner number.