ECE 7650 Applied Computational Intelligence

Project 2

Non-vectorized Implementation of Newton's Method

P2 Due Date: 6:00PM, Thursday 11 October 2018.

1. Do "Exercise 4: Logistic Regression" from Andrew's Ng's OpenClassroom online course: http://openclassroom.stanford.edu/MainFolder/DocumentPage.php?course=MachineLearning&doc=exercises/ex4/ex4.html

   a. Implement and test the solution as given by the web site, i.e., use the vectorized method to implement logistic regression using Newton's method.
   b. Create a non-vectorized implementation to implement logistic regression using Newton's method using the same data set.
   c. Compare your non-vectorized implementation with the vectorized implementation. You should get the same set of weights when both vectorized and non-vectorized implementation run for the same number of iterations.
      i. Compare weight values for iterations 1 and iterations 10.
      ii. Compare the time of execution of the vectorized and non-vectorized implementations.

   Note: you probably will not get the same result, because there may be a problem with the derivation of the non-vectorized equations. Can you solve the problem? Suggestion: try a simple example on pen and paper (1 feature, 2 training example (one positive and the other negative).

SUBMISSION: Submit a written report for grading. Give Matlab code, which outputs the values requested for questions i, and ii. Explain why the non-vectorized version does not work.