Homework 2

Due, Thursday, November 21, 2019

1. (50 points) Implement gradient descent-based logistic regression in Python. Use $\Delta J = 0.00001$ as the stopping criterion.

2. (50 points total distributed as below) Apply your code from question 2 to the iris virginica and virsicolor flowers. Specifically, randomly select 99 of these flowers for training your logistic model and use the remaining one flower for testing. You only need to do training once and testing once with your specific choice of the training flowers and testing flowers. That is to say, you don't need to do the leave-one-out cross validation 100 times.

   (a) (15 points) After your training, plot the total cost J vs iterations for your 99 training flowers for four scenarios.

   (b) (20 points) Predict the flower type of your testing flower for each of the four scenarios.

   (c) (15 points) Apply `sklearn.linear_model.LogisticRegression` to your specific choice of training flowers. With the intercept and coefficients produced by sklearn, calculate the total final cost J for your 99 flowers.