CLL 788

Assignment 1

You are CEO of a clothing company with outlets in many cities. You have decided to open an outlet in a new city. To help with the decision of selecting a city, you decide to look at population vs profit data and apply linear regression to see if any relation exists between population & profit with population being the independent variable.

1. Apply Batch LMS. Using the parameters obtained, predict profit using population training data. Plot a graph (population vs profit) of the obtained results and the training data. Use learning rate of 0.1. Analyze the results.
2. Apply Stochastic LMS. Using the parameters obtained, predict profit using population training data. Plot a graph (population vs profit) of the obtained results and the training data. Use learning rate of 0.1. Analyze the results.
3. Use least squares closed form solution and use the parameters obtained to predict profit using population training data.
4. Compare the results obtained using batch LMS, stochastic LMS & least squares closed form solution. Report your observations (Convergence time, accuracy etc.)
5. Suggest some other technique to perform LMS.
6. Manually (no use of computer code) perform locally weighted linear regression using the first four data points given in excel sheet. Query point is 7.576 and bandwidth parameter is 0.5. Use stochastic LMS for the same.

Note: Data is provided in the excel file “Assn1.xlsx”. Negative values in the profit column mean a loss.

Submission Instructions

1. Submit a zip file on moodle named “EntryNumber.zip” with all the code files and a pdf with all the graphs and analysis. Only Matlab & python are allowed.
2. Deadline for the submission is 20th January 11:59 PM.
3. For any doubts in the assignment, contact: Milan Roy: roymilaniitd@gmail.com