EE 580 Lab3 Part 1

Summer 2017   Nazarian   Score:___/

Student ID: _____   **Name: _____**
Assigned: Tuesday, May 23
Due: Thursday, June 1 at 11:59pm [Note: Lab3 will have more parts.]
Late submissions will be accepted two days after the deadline with a maximum penalty of 15% per day: For each day, submissions between 12 and 1am: 2%, 1 and 2am: 4%, 2 and 3am: 8% and after 3am: 15%.

- **All assignments including this lab are based on individual work. No collaborations (including no discussions) are allowed.**
- **We may pick some students in random to demonstrate their design and simulations. Please watch the first lecture of this course regarding the academic integrity policies and also refer to the syllabus for a summary of AI policies (including the penalties for any violation).**
- **If you have any concerns or doubts about what is or is not allowed or prohibited in this course, please contact the instructor.**

Motivation

In this lab you will practice a simple machine learning flow based on regression. This to learn a model for a scalar dependent variable y based on one or more explanatory variables (or independent variables) denoted by X.

Machine Learning in Python

Following our lectures,

1) Given a sample data (tuples (x,y)), you are first required to read them into lists (x into a list and y into another. This serves as datasets for regression.
2) Randomly choose part of the data for training and keep the rest for testing. Note that in reality, datasets could be very large, however your sample for this lab may not as large the realistic sets.
3) Use a linear regression or higher orders (quadratic, etc.) to train your machine learning system.
4) Calculate the error measure (e.g., based on SSE) of the test data.
5) Repeat steps 2 to 4 several times and choose the best regression.
6) Present your work graphically, using one of the methods stated in class.

Example: The following shows an example linear regression for the given data points.
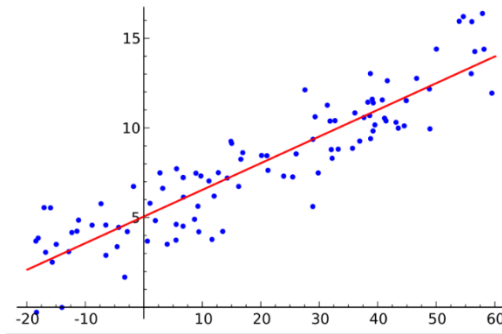
Submission

1. Zip all the files you need to submit into a zip file named: "firstname_lastname_lab3_part1".zip.
2. Your zip file should include all the coding parts the assignment asks for, and also a Readme.pdf. For this assignment it is okay that your zip file would only include one file, i.e., your Readme.pdf.
3. In your Readme.pdf, include any information that you think the course staff, especially the grader should know while grading your assignment: references, any non-working part, any concerns, etc.
    a. Any non-working part should be clearly stated
    b. The citations should be done carefully and clearly, e.g.: *"to write my code, lines 27 to 65, I used the Diijkstra's shortest path algorithm c++ code from the following website: www.SampleWebsite.com/..."*
    c. The Readme file content of labs and PAs can be hand-written or typed. In case you decide to hand-write, then please scan and include in your Readme.pdf.
        NOTE: this policy is different from that of the HW. For HW assignments, the solutions have to be handwritten.

    Use the provided BB submission link to submit your zip file for this assignment