**Programming Assignment-1 Univariate Linear Regression**

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**Introduction**

In this programming assignment, you will implement the gradient descent algorithm and test how learning rate α will impact the learning process.

**Part-I:**

1. The Jupyter notebook file, “Univariate Linear Regression-PartI-Incomplete.ipynb”, is provided.

Please fill in the blanks, where you can find the indications -- “Your code starts from here”.

1. Two files, “train.csv” and “test.csv” are provided. Please put down the following information after training:

*w*0 = 6.968712318098739

*w*1 = 2.0903326295089353

**Part-II:**

1. The Jupyter notebook file, “Univariate Linear Regression-PartII-Incomplete.ipynb”, is provided.

Please fill in the blanks, where you can find the indications -- “Your code starts from here”.

1. The provided program will output a figure showing the curves of hypothesis functions at every 200 iterations (epochs). Please experiment with the learning rate . Please attach figures for each learning rate in this document.

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1. Will the program work well with each of the learning rates? If not, which one(s) doesn’t return a valid answer?

**Answer**

The model will not work well with each of the learning rates. The model starts to diverge when learning rete = 0.05. But the divergence is so small that it is not noticeable. However, when learning rate = 0.1 it diverges quickly.

**Submission:**

* **Rule1:**
  + If you work with a partner, please name your zipped file as follows:

PA1\_LNAME1\_LNAME2.Zip for folder and PA1\_LNAME1\_LNAME2.docx for a word document, i.e., the file names should include both LAST NAMEs.

* + If you work on your own, the format should be

PA1\_LNAME.Zip for folder and PA1\_LNAME.docx for a word document.

* **Rule2:**
  + Put your FULL names whether working in a group or individually in the word document.
* **Rule3:**
  + **EVERYONE** in the class should submit this Assignment, which should provide all files (such as **ipynb** files etc.. ) that are necessary for the execution of code in the submission folder.
* **Rule4:**
  + Please submit two Jupyter files, each of which is corresponding to Part I and Part II, respectively.