

# PROGRAMMING ASSIGNMENT

- Write a python code to find the best parameters for univariate linear regression problem using the Gradient Descent Algorithm.
- You shall run the program with following command
  - `Python UNI_LR_GD.py`
- The details are given at next slide

# INPUT OF THE PROGRAM

- Enter the Name of Train Data File: data.csv
  - the data.csv file shall have value for x and y. All the values shall be use to find the parameters
- Enter the Value of Learning Rate: 0.9
- Enter the Name of Test Data: test.csv
  - The test.csv shall contain the values that are required to predict.

# OUTPUT OF THE PROGRAM

Output	Explanation
Predictions.csv	<p>This file shall show the prediction values for each example if test.csv- The first row shall show the header and all other rows show the individual values. Finally, the last row shall print the average error</p> <p>X-Value, Actual-Value, Predicted-Value, Lest Square Error</p> <p>4,16,14, 4</p> <p>3,9,12,9</p> <p>Average Error: 6.5</p>
CostFunction_Theta0.csv	<p>The file show the value of cost function with respect to different values of theta 0. the fist row of the file contains header information, all other rows contains the different values till convergence, and last row shall print the learning rate value</p> <p>Theta0_Value, CostFunction</p> <p>0.5,30</p> <p>Learning Rate: 0.9</p>
CostFunction_Theta1.csv	Same as above

# SUBMISSIONS

- Program and files
  - You need to submit the **UNI\_LR\_GD.py** file along with data, test file and output files
- Documentation (A MS Word file that contains)
  - A graph for different theta0 value during the convergence of gradient descent algorithm and values of cost function on y-axis when alpha is 0.9
  - Another graph same as previous one but theta1 at x-axis and cost function at y-axis when alpha is 0.9
  - Add two more graphs same as above two graphs with alpha 0.5
  - **Discussion:** The affect of learning rate on convergence