

# Linear Regression Assignment (Week 3)

Total points 100/100 ?

Greetings from Consulting and Analytics Club, IIT Guwahati.

We hope you had a great learning experience until now. Reaching till Week 3 Assignment is no small feat!

This is your graded assignment/mini project for Week 3.

Here you will apply the algorithms you have learned in week 3 in Python.

You need to write the code in the jupyter notebook. This quiz will thoroughly check your understanding of the Week 3 concepts.

This assignment will check your concepts of Linear Regression, Cost Function, Gradient Descent.

For The Jupyter Notebook refer to the drive link :

<https://drive.google.com/drive/folders/1lvig2bJuvINZiYfWxUmCc3315TUeLn1Q?usp=sharing>

Instructions:

- 1) Go to the Drive link and download 2 files in the same folder(exercise1.ipnyb and ex1data1.txt)
- 2) Complete the jupyter notebook
- 3) You do not have to submit any code.
- 4) After completion of the notebook you can answer the quiz questions

General Guidelines:

- 1) All questions are compulsory and thus should be attempted.
- 2) Each Question has weightage and will contribute in the final grading of the course.
- 3) Please attempt this if you have completed all the 5 days of Week 3.
- 4) Violation of the honor code will lead to harsh actions being taken.

Note: Some questions may require studying certain topics from the web , no support material will be provided for the same, it is up to the participants to study it on their own.



## Warmup Question

10 of 10 points

✓ `numpy.eye(n)` creates an  $n \times n$  unit matrix. \*

10/10

- ☒ True
- ☐ False



## Compute Cost.

40 of 40 points

In the exercise 1 notebook, get the data ready and plot it. Then complete the code for `computeCost(X, y, theta)` function.

✓ Compute the cost with  $\theta = [0, 0]$ . \*

20/20

- ☒ Between 30 and 33.
- ☐ Between 22 and 25.
- ☐ Between 17 and 21.
- ☐ Between 43 and 46.
- ☐ Other: .....



✓ Compute Cost With  $\theta = [-1, 2]$  \*

20/20

☐ Between 78 and 81.

☐ Between 64 and 67.

☒ Between 52 and 55.



☐ Between 47 and 50.

☐ Other: .....

### Gradient Descent

50 of 50 points

Following the steps in the notebook, complete the function for calculating gradientDescent.

✓ With  $\alpha=0.01$ , iterations=1500 and initial  $\theta=[0,0]$ , calculate the  $\theta$  after gradient descent. \*

20/20

☐ [-3.8781, 1.1913]

☒ [-3.6303, 1.1664]



☐ [-1.5810, 0.9605]

☐ [-0.5761, 0.8595]

☐ Other: .....



✓ Using the above theta, after gradient descent calculate profit for sizes 30/30 35000 and 70000. \*

☒ 4519.77 and 45342.45. ✓

☐ 7519.77 and 35342.45.

☐ 3519.77 and 55342.45.

☐ 11519.77 and 35342.45.

☐ Other: .....

### Before Submitting

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THE USER ID AND PASSWORD FOR ALL QUIZZES/ASSIGNMENTS IS SAME THROUGHOUT COURSE

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