CS 6375

ASSIGNMENT 1

Names of students in your group:

1. Saketh Madishetty (SXM230092)
2. Krishna Rohith Vemulapalli (KXV220041)

Number of free late days used: \_\_\_\_\_0\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   
Note: You are allowed a **total** of 4 free late days for the **entire semester**. You can use at most 2 for each assignment. After that, there will be a penalty of 10% for each late day.

Please list clearly all the sources/references that you have used in this assignment.

PART 1:

Q. Are you satisfied that you have found the best solution? Explain.

No we are not satisfied with the results.

The R2 error that we got after running our model is ~0.52. We know that the values between 0-0.3 is weak, 0.3-0.6 is moderate and 0.6 to 1 is a strong model. Hence the model that we built is moderate.

*Run log with different parameters:*

Run 1:

Learning Rate – 0.001

No of iterations – 10

Starting weights – 0

Starting bias – 0

Predicted weights : [0.03137718 0.22493841 0.21104102 0.29182847]

Predicted bias : 0.41210605642029174

Training MSE : 1734.664909228198

Testing MSE : 1546.9954453664427

Run 2:

Learning Rate – 0.001

No of iterations – 100

Starting weights – 0

Starting bias – 0

Predicted weights : [0.34064697 1.81421838 1.62269213 2.41404189]

Predicted bias : 3.388348621132103

Training MSE : 1115.2888425945196

Testing MSE : 1167.060803944442

Run 3:

Learning Rate – 0.001

No of iterations – 1000

Starting weights – 0

Starting bias – 0

Predicted weights : [-2.67782586 8.13157048 15.63447024 13.69306678]

Predicted bias : 20.879279368974135

Training MSE : 266.94626537479223

Testing MSE : 91.99274654054703

Run 4:

Learning Rate – 0.01

No of iterations – 1000

Starting weights – 0.5

Starting bias – 0.5

Predicted weights : [-4.50189294 15.82959668 13.21883492 15.39621468]

Predicted bias : 16.099944406034176

Training MSE : 83.9677901696656

Testing MSE : 98.70003337088473

Run 5:

Learning Rate – 0.01

No of iterations – 2000

Starting weights – 0.05

Starting bias – 0.05

Predicted weights : [-2.70963587 14.71242976 9.68571584 17.89007216]

Predicted bias : 20.839670328903658

Training MSE : 100.86387617582777

Testing MSE : 121.58100108406356

Run 6:

Learning Rate – 0.05

No of iterations – 2000

Starting weights – 0

Starting bias – 0

Predicted weights : [-30.88804594 -0.51120372 26.18508528 -0.44101163]

Predicted bias : 33.448323801139686

Training MSE : 201.1282349223704

Testing MSE : 88.0896304560742

**Run 7:**

Learning Rate – 0.05

No of iterations – 2000

Starting weights – 0.05

Starting bias – 0.05

Predicted weights : [-13.95756545 11.71214245 18.28035882 13.81858411]

Predicted bias : 17.05512310056812

Training MSE : 81.55056874566806

Testing MSE : 93.933740199287

**Run 8:**

Learning Rate – 0.5

No of iterations – 2000

Starting weights – 0.05

Starting bias – 0.05

Predicted weights : [-18.650522 13.53987526 12.96526438 10.64895617]

Predicted bias : 22.357327571163015

**Training MSE : 56.05018976699618**

**Testing MSE : 94.50796901907331**