Assignment 1
Report

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Data1.csv:

I applied linear regression on this dataset and found that it is following the linear graph. I also took a look by scattering it on the matplotlib.
Now, Let's have a look at observations made by my code and the given sklearn code.

Details	My_Model	Sklearn_Model
m (Slope)	2.3840600660571796	[2.38406007]
C (Intercept)	5.68078712676124	[5.68078713]
MAE	1.2805559784291458	1.2805559784291458
MSE	2.078525401777327	2.078525401777327
RMSE	1.441709194594155	1.441709194594155

Equation for hyperplane would be:

Y = 2.38x + 5.68

Data2.csv:

I scattered the data on the matplotlib and found a guess as it might be an exponential graph. Then I took a log(y) an applied linear regression and the result followed my guess.
Now, Let's have a look at observations made by my code and the given sklearn code.

Details	My_Model	Sklearn_Model
gama	`0.9729974518460563`	`[0.97299745]`
beta	`39.73063951776823`	`[39.73063952]`
MAE	`0.2349883528902 57`	`0.23498835289025738`
MSE	`0.07643342704351969`	`0.07643342704351966`
RMSE	`0.2764659600086775`	`0.2764659600867746`

Equation for hyperplane would be:

$$\mathbf{Y = 0.973x + log(39.73)}$$

Data3.csv:

After plotting all the points given in the data I found that the given data is not following any linear or exponential pattern. I also verified it via exponential and linear both regression but linear regression gave better results than exponential. Now, Let's have a look at observations made by my code and the given sklearn code.

Details	My_Model	Sklearn_Model
m (Slope)	`0.09419021414817913`	`[0.09419021]`
C (Intercept)	`1.1770620783119958`	`[1.17706208]`
MAE	`0.2946779330131 0363`	`0.2946779330131 0363`
MSE	`0.16173044143088558`	`0.1617304414308 8558`
RMSE	`0.4021572347116058`	`0.4021572347116058`

Equation for hyperplane would be:

Y = 0.0941x + 1.177

Data4.csv:

I applied linear regression on this dataset and found that it is following the linear graph. I also took a look by scattering it on the matplotlib.
Now, Let's have a look at observations made by my Linear regression model, my gradient descent model and the given sklearn code.

Details	My_Model_LinearRegression	By_Grad_Descent	Sklearn_Model
m1 (Slope)	6.13243763	6.100823243679714	6.13243763
m2	2.39226554	2.4155596448457 67	2.39226554
m3	7.74681038	7.7556003814915 9	7.74681038
C (Intercept)	13.23947782	13.215822857145 014	13.23947782444535 9
MAE	5.1555056303756 59	5.1552927609958 12	5.15550562646378
MSE	34.62048082924 357	34.620545885491 13	34.6204808292435 6
RMSE	5.883917133104 745	5.8839226614131 44	5.8839171331047 45

Equation for hyperplane would be:

Y = 6.13x1 + 2.39x2 + 7.74x3 + 13.239