Linear Regression Analysis Report

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Dataset 1

By plotting this dataset as a graph we can get that it is a normal form of Linear Regression. After trying different versions errors are listed below-

Function Type Used	Mean Absolute Error	Mean Squared Error	Root Mean Squared	R-squared
multiLinearReg (my_output)	1.15253739	1.84772271	0.30395088	0.95448323
multiLinearReg (scikit-learn_output)	1.15253739	1.84772271	0.30395088	0.95448323
expoLinearReg (my_output)	1.34586147	2.48731402	0.30395088	0.95448323
expoLinearReg (scikit-learn_output)	1.34586147	2.48731402	0.35265522	0.93866524
polyLinearReg (my_output)	1.12519248	2.3468628	0.30160663	0.95489479
polyLinearReg (scikit-learn_output	1.15253739	1.84772271	0.30395088	0.95448323

For this dataset (multiLinearReg)Normal Linear Regression is the best model because both outputs are the same.

Dataset 2

By plotting this dataset we can observe exponential behaviour of the graph so we will use expoLinearReg-

Function Type Used	Mean Absolute Error	Mean Squared Error	Root Mean Squared	R-squared
expoLinearReg (my_output)	8537.51124713	6^10^8	5578.35228999	0.9188804
expoLinearReg (scikit-learn_output)	8537.51124713	6^10^8	5578.35228999	0.9188804

Dataset 3

After plotting this dataset we are unable to get a clear cut perspective so after different trials we got a function with better fitting

Function Type Used	Mean Absolute Error	Mean Squared Error	Root Mean Squared	R-squared
multiLinearReg (my_output)	0.28848612	0.11112138	0.07453904	0.11860306
expoLinearReg (scikit-learn_output)	0.39251686	0.19883427	0.09970814	-0.12952174

Here we can see that MAE, MSE, RMSE are better than other datasets but R-squared is very bad so I am unable to guess what is suitable for this data.

Dataset 4

This is a 4D dataset and after using different functions and by observing errors given data has less error while using multiLinearReg.

Function Type Used	Mean Absolute Error	Mean Squared Error	Root Mean Squared	R-squared
multiLinearReg (my_output)	32.12918681	5.10251859	1.26746177	0.98580599