Least Square Regression:

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A) ***Lasso Regularisation(L1)***:

Here, the hyperparameter is Alpha.

When Alpha = 0.001, accuracy = 0.701923

When Alpha = 0.1, accuracy =0.677884615385

When Alpha = 100, accuracy = 0.639423076923

When Alpha = 100000, accuracy = 0.639423076923

When Alpha = 10000000, accuracy = 0.639423076923

Here, as Alpha tends to 0, accuracy increases, and when Alpha is 0, it is equivalent to No regularization case, which has an accuracy of 0.730769230769

The optimal value of Alpha which can be used to consider the effect of Lasso is 0.01.

B) ***Ridge Regularisation(L2)***:

Here, hyperparameter is Alpha

When Alpha = 0.001, we get an accuracy of 0.716346153846

When Alpha = 0.1, we get an accuracy of 0.716346153846

When Alpha = 100, we get an accuracy of 0.701923076923

When Alpha = 100000, we get an accuracy of 0.639423076923

When Alpha = 10000000, we get an accuracy of 0.639423076923

Here, as Alpha tends to 0, accuracy increases, and when Alpha is 0, it is equivalent to No regularization case, which has an accuracy of 0.730769230769

The optimal value of Alpha which can be used to consider the effect of Ridge is 0.01.

C) ***Elastic Net Regularisation***:

Here, regularisation is of type a * L1 + b * L2 where L1ratio= a/(a+b) and alpha = a+b

So, hyperparameters are Alpha, L1ratio.

When Alpha = 0.002 and L1ratio = 0.5, we get an accuracy of 0.697115384615

When Alpha = 0.001 and L1ratio = 0.3, we get an accuracy of 0.701923076923

When Alpha = 0.001 and L1ratio = 0.1, we get an accuracy of 0.706730769231

When Alpha = 0.001 and L1ratio = 0.001, we get an accuracy of 0.706730769231

Here, as Alpha tends to 0, accuracy increases, and when Alpha is 0, it is equivalent to No regularization case, which has an accuracy of 0.730769230769

The optimal value of Alpha which can be used to consider the effect of Elastic is 0.001 and L1ratio is 0.1

D) ***No Regularisation***:

Here, it has no hyperparameters.

Accuracy is 0.730769230769