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Assignment - 4

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Question - 1

Linear Regression:

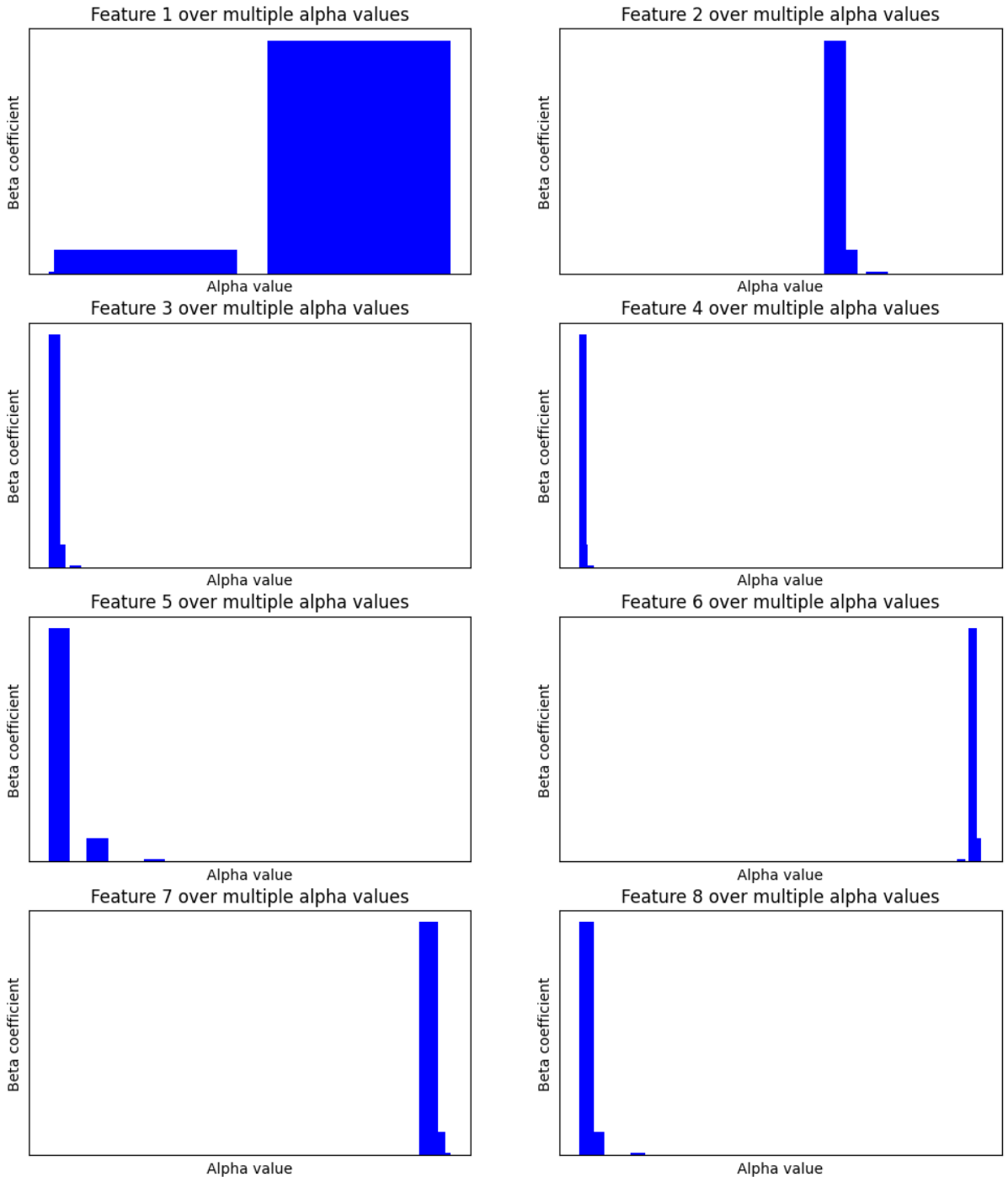
Train Mean Squared Error: 4.773808603984102
Validation Mean Squared Error: 4.564933800320933
Test Mean Squared Error: 5.358162932581064

Test Mean Squared Error: 5.358162932581064

Ridge Regression:

Alpha: 0.0001, Validation MSE: 4.5650
Alpha: 0.0010, Validation MSE: 4.5651
Alpha: 0.0100, Validation MSE: 4.5667
Alpha: 0.1000, Validation MSE: 4.5860
Alpha: 1.0000, Validation MSE: 4.7461
Alpha: 10.0000, Validation MSE: 5.5304
Alpha: 100.0000, Validation MSE: 6.7724
Alpha: 1000.0000, Validation MSE: 7.7514
Alpha: 10000.0000, Validation MSE: 9.3977

Test Mean Squared Error for alpha = 0.0001:4.7465



Question - 2

Screenshots shows the training, testing and run time of the PCA and LDA for question A and B.

A)

	Training Time	Training Accuracy using PCA	Testing Accuracy using PCA	Running Time	Training Accuracy using LDA	Testing Accuracy using LDA	Running Time
0	5	0.877612	0.434701	0.172461	0.859701	0.396455	0.340593
1	10	0.943284	0.500678	0.300681	0.929851	0.473541	0.575368
2	15	0.981095	0.975124	0.299624	0.981095	0.972637	0.603167

B)

	Training Time	Training Accuracy using PCA	Testing Accuracy using PCA	Running Time	Training Accuracy using LDA	Testing Accuracy using LDA	Running Time
0	5	0.910448	0.448694	0.106400	1.0	0.527985	0.224739
1	10	0.947761	0.515604	0.123593	1.0	0.754410	0.356384
2	15	0.986070	0.980100	0.144407	1.0	0.985075	0.430748

C)

We have visualised Eigen Face, by utilising the initial five primary eigenvectors obtained through PCA.