1e)
Maximum posterior weight estimation -

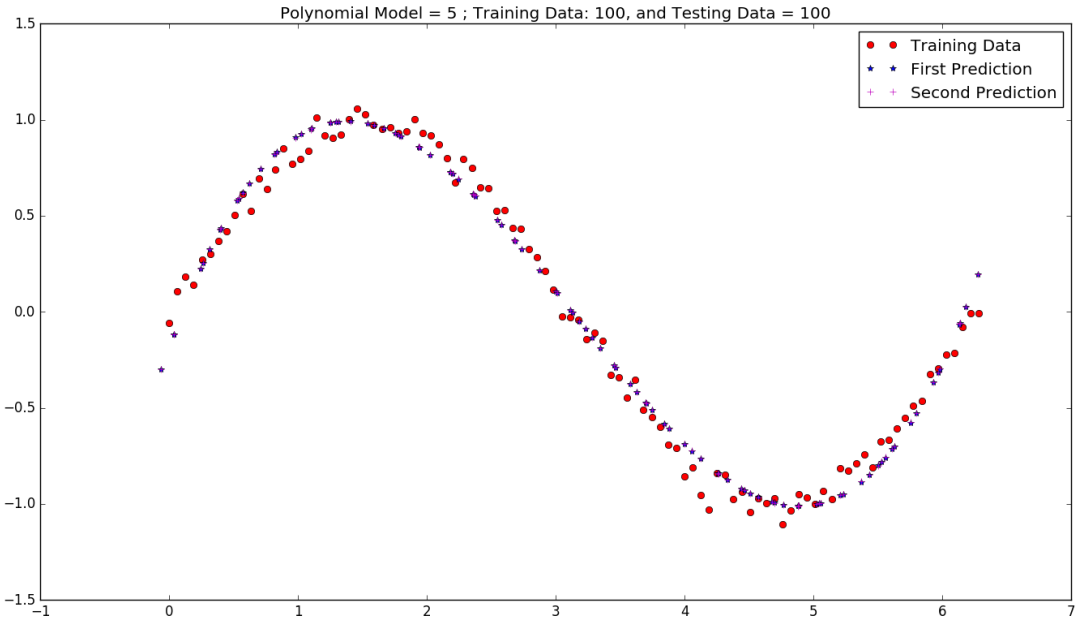
The parameters based on which the output calculation varies in this case is Polynomial model, No.of Training Samples and hyperparameter α.

Important : We can find that we get the better accuracy by adding the gaussian with variance y_variance than without adding to the y_test predicted.

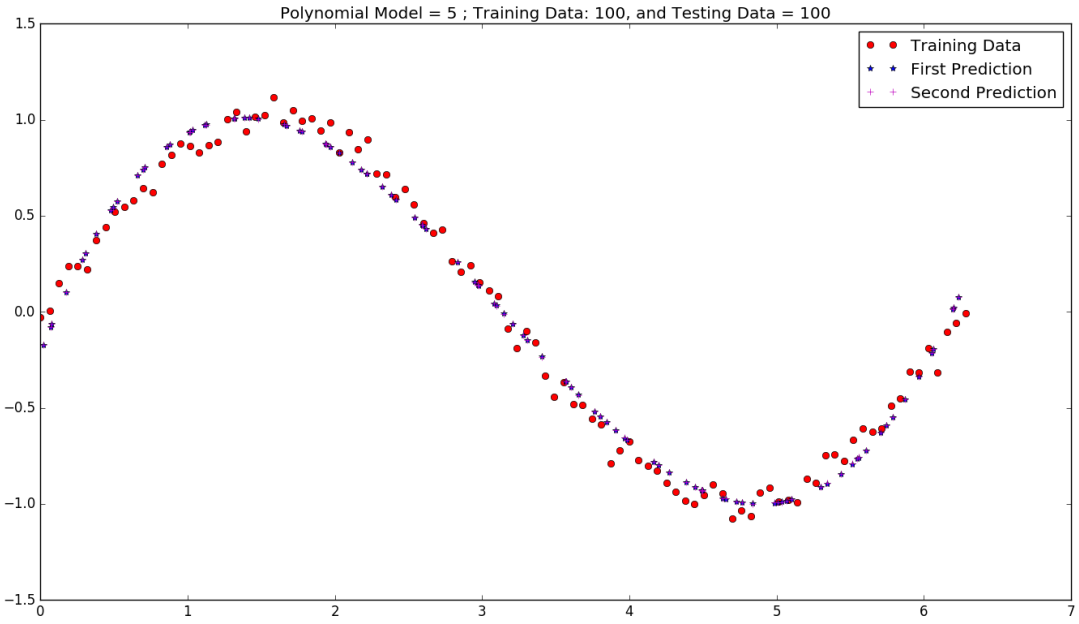
- For M = 5

We can observe that as the hyperparameter changes, the error is changing which means the accuracy of prediction of data is changing. We need to find such a hyperparameter which gives best accuracy.

Also by increasing samples of training data, accuracy is increasing in better way.



Average error(adding variance): 0.00517540270669
Average error: 0.00520283046087



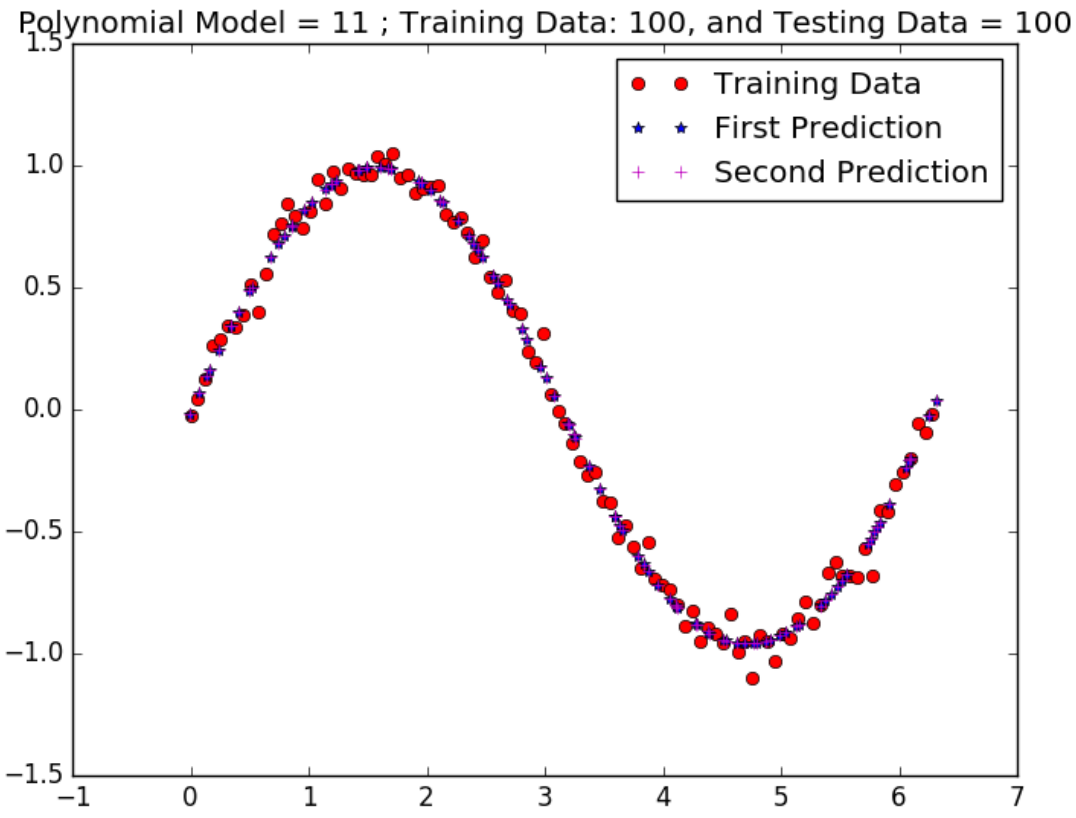
Average error(adding variance): 0.00476508312082
Average error: 0.00477542423307

- For M = 11

Even in this case, we can observe that as the Lagrangian multiplier changes, the error is changing which means the accuracy of prediction of data is changing. We need to find such a Lagrangian multiplier which gives best accuracy.

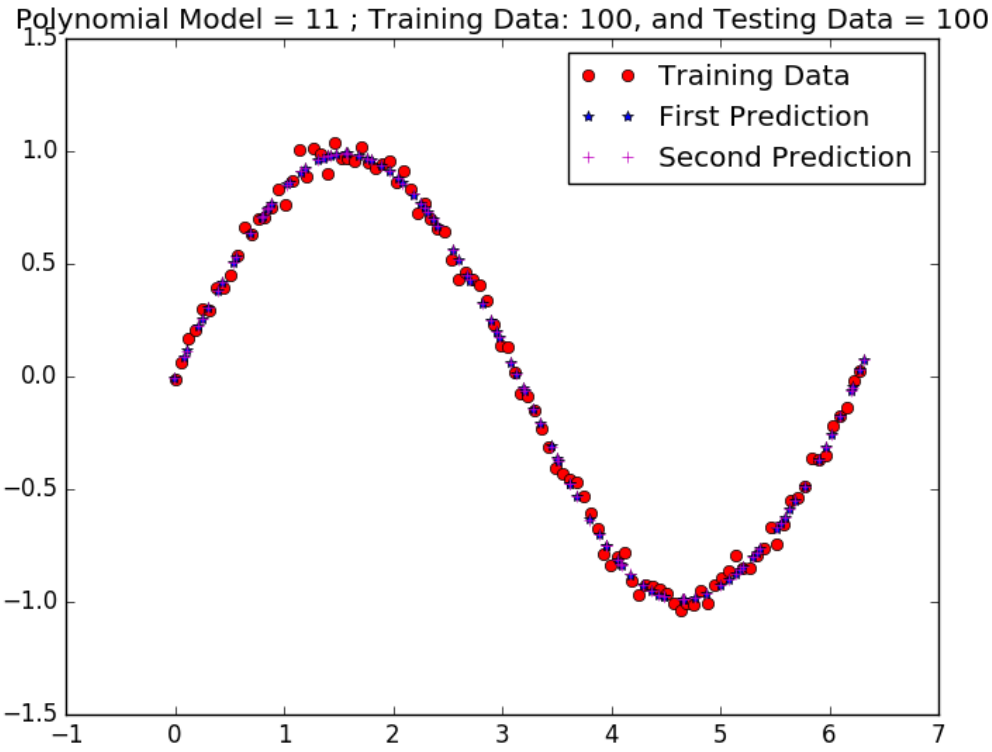
Also by increasing samples of training data, accuracy is increasing in better way.

Important : In case of problem 1b), we did not get the correct prediction with M=11. But by regularisation, we can observe it. It is because of having control over weights. We need to find a proper hyperparameter to get the best accuracy.



Average error(adding variance): 0.000278191608012

Average error: 0.00027910136243



Average error(adding variance): 0.000218654886015
Average error: 0.000221411140107