

**BAYESIAN**

**CURVE**

**FITTING**

Assignment-3

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Software Engineering-II

Software Engineering Web Applications

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## Assignment-3

### Performance Evaluation of the predictions

The assignment involves prediction of price using the data collected. I have used python program for computing the prediction. I have used a total of 20 data sets consisting nearly 30 values each as training data and a Test data MSFT for which the prediction was evaluated.

Working of the Program:

The program reads the data stored in a csv file and stores the target and x values. If the target values present in a CSV file is N, then the program uses the first N-1 values for curve fitting based on the values of  $\alpha$  and  $\beta$ . Once the Curve fitting is done, the program tries to predict the Nth value of the stock.

I have taken the closed values of each stock as the target value. By running random experiments on the values of  $\alpha$  and  $\beta$ , I have selected  $\alpha = 0.647$  and  $\beta = 12$ . The order of the polynomial is selected as '5' for this case as it gives the best predicted values for the selected constants. The main reason to select these values is that as mentioned  $\alpha$  and  $\beta$  are fixed and for these values for almost all the training data I was able to achieve the lowest absolute errors (Can have better values other than these).

I have calculated the mean of these absolute and relative errors for the data sets so that I can get the performance evaluation of the predicted values.

#### **Results from the Prediction:**

For the Company ID: AAPL

Actual Price is 171.389999 Predicted Price is 171.8059567471273

Absolute error is: 0.41595774712732236 and Relative error is 0.002426966273144808

For the Company ID: AMZN

Actual Price is 1436.219971 Predicted Price is 1433.8036331101569

Absolute error is: 2.4163378898431347 and Relative error is 0.0016824288330712363

For the Company ID: FB

Actual Price is 165.039993 Predicted Price is 157.46931827740275

Absolute error is: 7.570674722597261 and Relative error is 0.045871758626391

For the Company ID: GOOGL

Actual Price is 1397.810059 Predicted Price is 1346.6973213615715

Absolute error is: 51.11273763842837 and Relative error is 0.03656629690803246

For the Company ID: MA

Actual Price is 192.990005 Predicted Price is 190.26023219716163

Absolute error is: 2.7297728028383688 and Relative error is 0.014144633048941414

For the Company ID: NFLX

Actual Price is 331.619995 Predicted Price is 331.41710548472867

Absolute error is: 0.20288951527135168 and Relative error is 0.0006118132752259153

For the Company ID: TRIP

Actual Price is 48.220001 Predicted Price is 47.91602903790272

Absolute error is: 0.30397196209728605 and Relative error is 0.006303856403845492

For the Company ID: TSLA

Actual Price is 279.070007 Predicted Price is 287.079099211934

Absolute error is: 8.009092211934046 and Relative error is 0.02869922245687279

For the Company ID: TWTR

Actual Price is 33.419998 Predicted Price is 32.59588214895618

Absolute error is: 0.8241158510438211 and Relative error is 0.02465936266793975

For the Company ID: VAC

Actual Price is 118.580002 Predicted Price is 118.04030742469516

Absolute error is: 0.5396945753048357 and Relative error is 0.0045513119092782245

For the Company ID: AAPLtest

Actual Price is 189.830002 Predicted Price is 188.06985794812888

Absolute error is: 1.7601440518711229 and Relative error is 0.009272212154699987

For the Company ID: AMZNtst

Actual Price is 1601.859985 Predicted Price is 1579.8851861993517

Absolute error is: 21.974798800648387 and Relative error is 0.013718301853110081

For the Company ID: FBtst

Actual Price is 186.899994 Predicted Price is 182.574278847219

Absolute error is: 4.325715152780987 and Relative error is 0.023144544096566355

For the Company ID: GOOGLtest

Actual Price is 1524.869995 Predicted Price is 1524.851031348997

Absolute error is: 0.018963651003105042 and Relative error is 1.2436241165008327e-05

For the Company ID: MATst

Actual Price is 174.720001 Predicted Price is 172.7035835006438

Absolute error is: 2.0164174993562085 and Relative error is 0.011540851006269217

For the Company ID: NFLXtst

Actual Price is 298.070007 Predicted Price is 291.6892477233796

Absolute error is: 6.380759276620381 and Relative error is 0.02140691490848451

For the Company ID: TRIPTst

Actual Price is 40.830002 Predicted Price is 40.53116076014057

Absolute error is: 0.2988412398594278 and Relative error is 0.007319158099953749

For the Company ID: TSLAtst

Actual Price is 304.700012 Predicted Price is 285.7946475345512

Absolute error is: 18.905364465448827 and Relative error is 0.062045827767964856

For the Company ID: TWTRtst

Actual Price is 29.530001 Predicted Price is 28.75059488809771

Absolute error is: 0.7794061119022899 and Relative error is 0.02639370421634222

For the Company ID: VACtst

Actual Price is 129.190002 Predicted Price is 132.55270216574382

Absolute error is: 3.3627001657438313 and Relative error is 0.026029105299834515

For the Company ID: MSFT

Actual Price is 170.229996 Predicted Price is 165.9454689353389

Absolute error is: 4.284527064661091 and Relative error is 0.025169048730172627

For total Estimation:

Absolute error is: 6.5825182093514965 and Relative error is 0.018646178798919343

Here we can observe that the mean of absolute error is around 6.58 and relative error is 0.0186 which shows that the prediction is almost nearly equal to the original value. The first 20 data sets are used as training data. The data set MSFT.csv is used as the testing data for the prediction.