Stock Price Prediction

Using Machine Learning models

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Problem

We wanted to predict the **Last Traded Price** of the Stock GLAXOSMITH

Solution

We used machine learning **regression** models to predict the stock price of GLAXOSMITH

Implemented the models

Multiple Linear Regression

- ✓ Imported data set
- ✓ Handled missing data: Eliminated rows with 0 (1%)
- ✓ Dataset split: 80% Training & 20% Test
- ✓ Trained MLR model on the training set
- ✓ Predicted test results
- ✓ Evaluated model performance with R^2 and RMSE score
- ✓ Visualised results with plots

Polynomial Linear Regression

- ✓ Imported data set
- ✓ Handled missing data: Eliminated rows with 0 (1%)
- ✓ Dataset split: 80% Training & 20% Test
- ✓ Trained PLR model on the training set
- ✓ Predicted test results
- ✓ Evaluated model performance with R^2 and RMSE score
- ✓ Visualised results with plots

Decision Tree Regression

- ✓ Imported data set
- ✓ Handled missing data: Eliminated rows with 0 (1%)
- ✓ Dataset split: 80% Training & 20% Test [Manual split]
- ✓ Trained Decision tree model on the training set
- ✓ Predicted test results
- ✓ Evaluated model performance with R^2 and RMSE score
- ✓ Visualised results with plots

Implemented the models

Random Forest Regression

- ✓ Imported data set
- ✓ Handled missing data: Eliminated rows with 0 (1%)
- ✓ Dataset split: 80% Training & 20% Test [Manual split]
- ✓ Trained Random forest model on the training set
- ✓ Predicted test results
- ✓ Evaluated model performance with R^2 and RMSE score
- ✓ Visualised results with plots

Support Vector Regression

- ✓ Imported data set
- ✓ Handled missing data: Eliminated rows with 0 (1%)
- ✓ Reshape dependent variable y into vector
- ✓ Dataset split: 80% Training & 20% Test
- ✓ Feature scaling used standard scaler.
- ✓ Trained SVR model on the training set with radial basis function kernel.
- ✓ Predicted test results
- ✓ Evaluated model performance with R^2 and RMSE score
- ✓ Visualised results with plots

K nearest Neighbour Regression

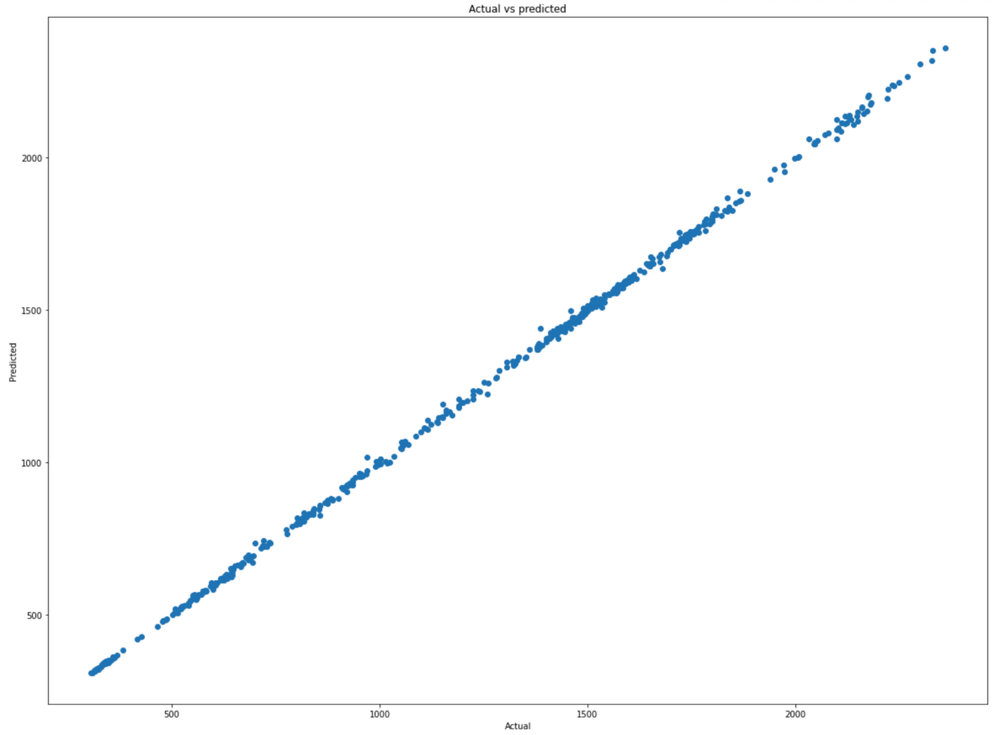
- ✓ Imported data set
- ✓ Handled missing data: Eliminated rows with 0 (1%)
- ✓ Dataset split: 80% Training & 20% Tes
- ✓ Feature scaling used min-max scaler
- ✓ Trained KNN model on the training set
- ✓ Predicted test results
- ✓ Evaluated model performance with R^2 and RMSE score
- ✓ Visualised results with plots

Results obtained

Multiple Linear Regression

R^2 Score: 0.99962
RMSE Score: 9.9698

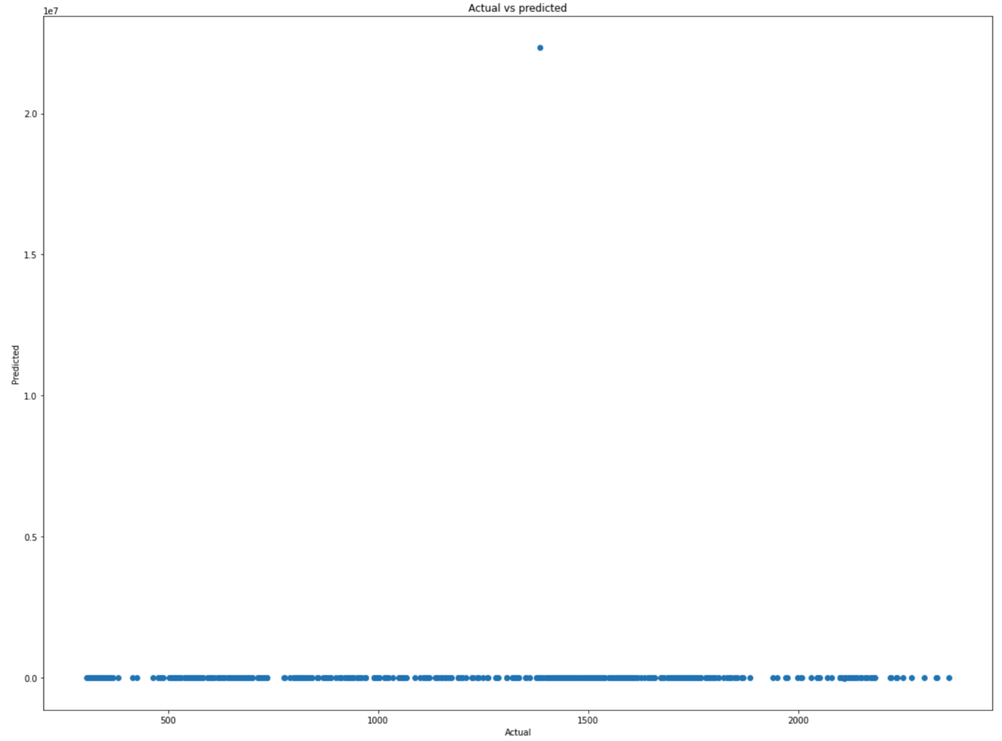
```
Text(0.5, 1.0, 'Actual vs predicted')
```



Polynomial Linear Regression

R^2 Score: -3445515.1010
RMSE Score: 957268.24203

```
Text(0.5, 1.0, 'Actual vs predicted')
```

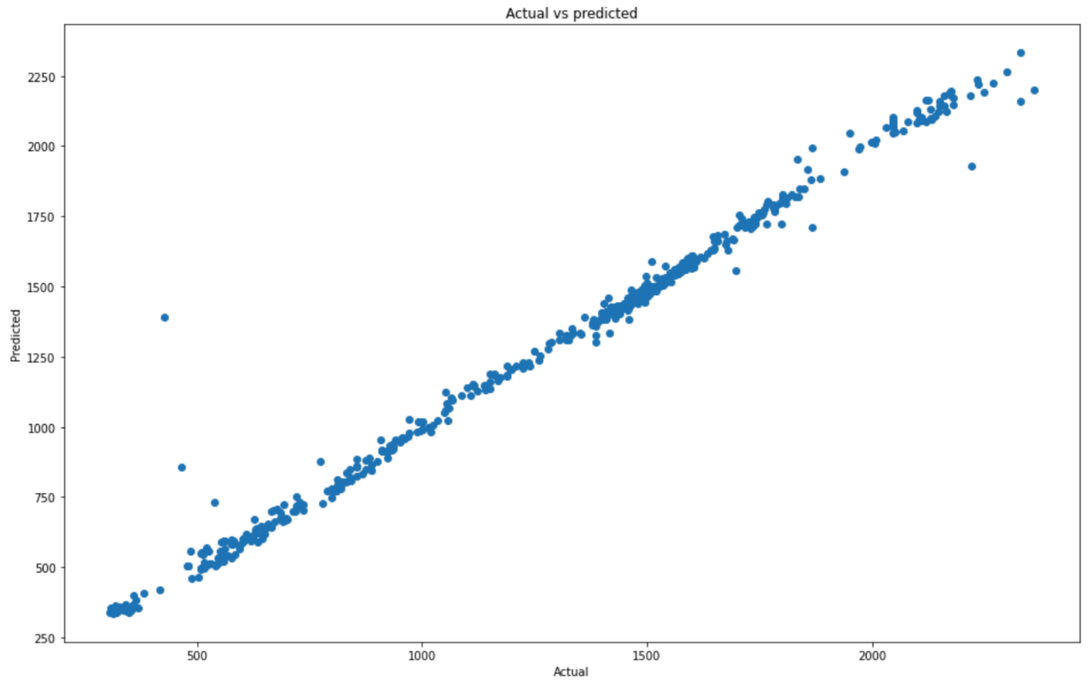


Results obtained

Support Vector Regression

R^2 Score: 0.9885
RMSE Score: 724.819

```
Text(0.5, 1.0, 'Actual vs predicted')
```

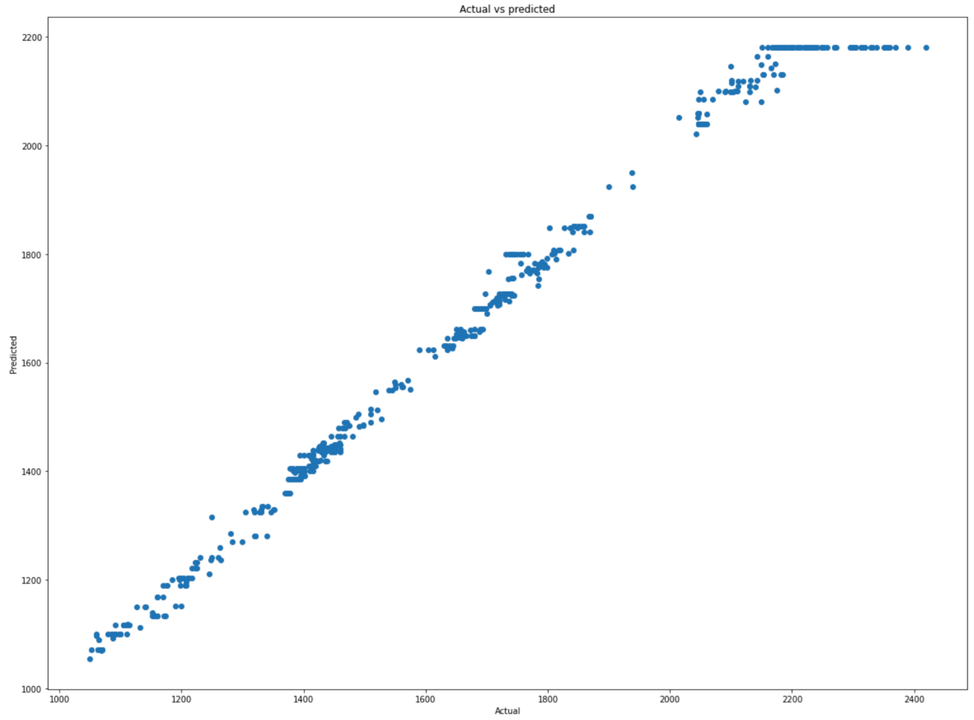


Results obtained

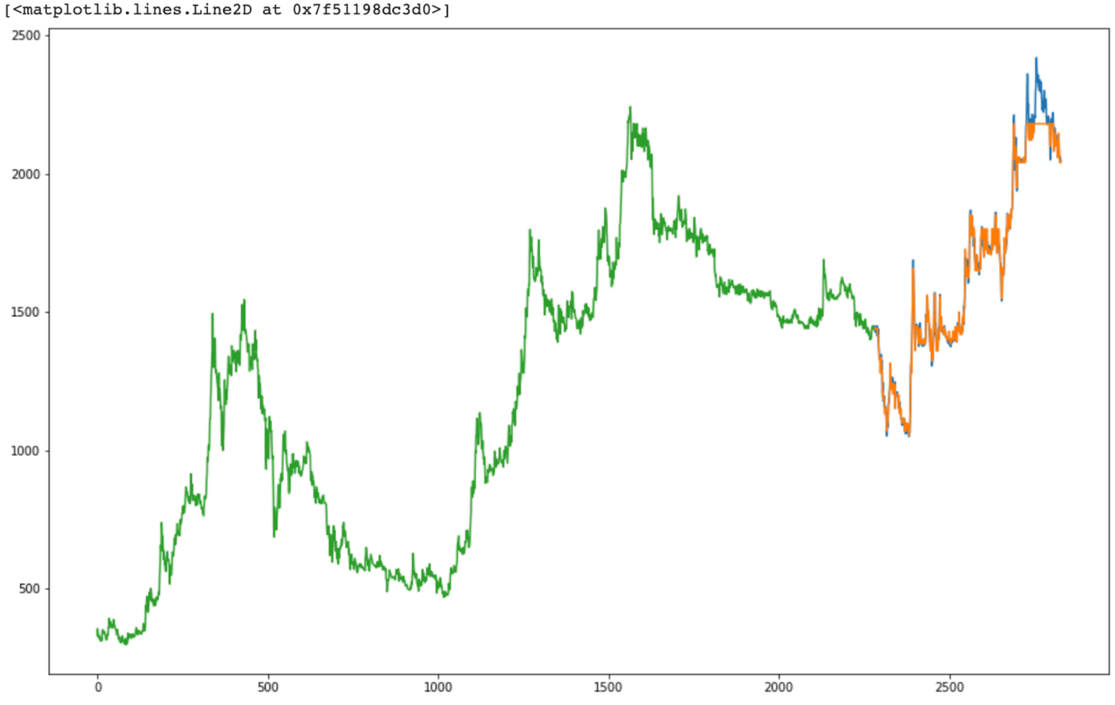
Decision Tree Regression

R^2 Score: 0.9886
RMSE Score: 38.34132

Text(0.5, 1.0, 'Actual vs predicted')



[<matplotlib.lines.Line2D at 0x7f51198dc3d0>]

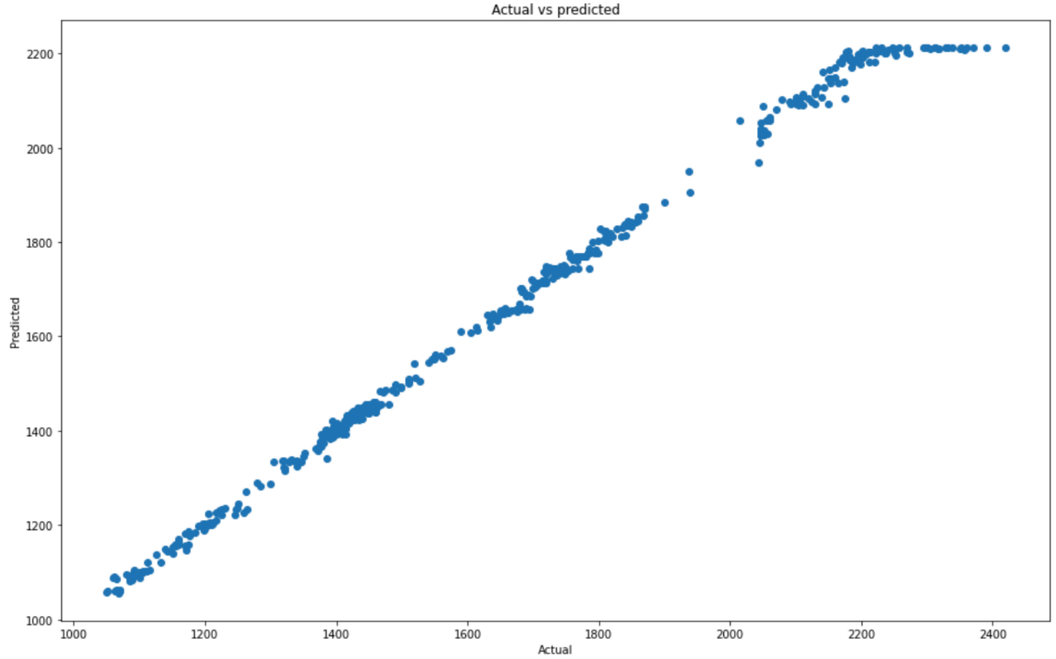


Results obtained

Random Forest Regression

R^2 Score: 0.9934
RMSE Score: 29.14876

```
Text(0.5, 1.0, 'Actual vs predicted')
```



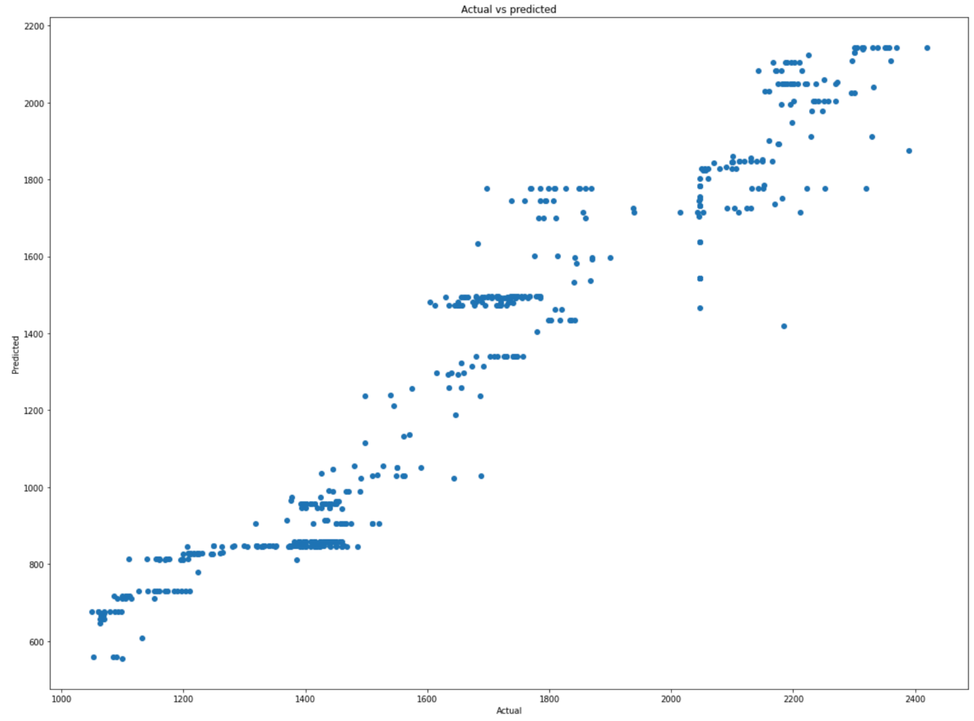

```
[<matplotlib.lines.Line2D at 0x7f0c9b226110>]
```

Results obtained

K nearest Neighbour Regression

R^2 Score: -0.2316
RMSE Score: 398.5962

```
Text(0.5, 1.0, 'Actual vs predicted')
```

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```

Conclusion

Successfully predicted the future traded price of the Stock of GLAXOSMITH

Best Results

1. Multiple Linear Regression
2. Random forest Regression
3. Decision tree Regression

Unsatisfactory results

1. Polynomial Linear Regression
2. K nearest neighbour
3. Support vector Regression