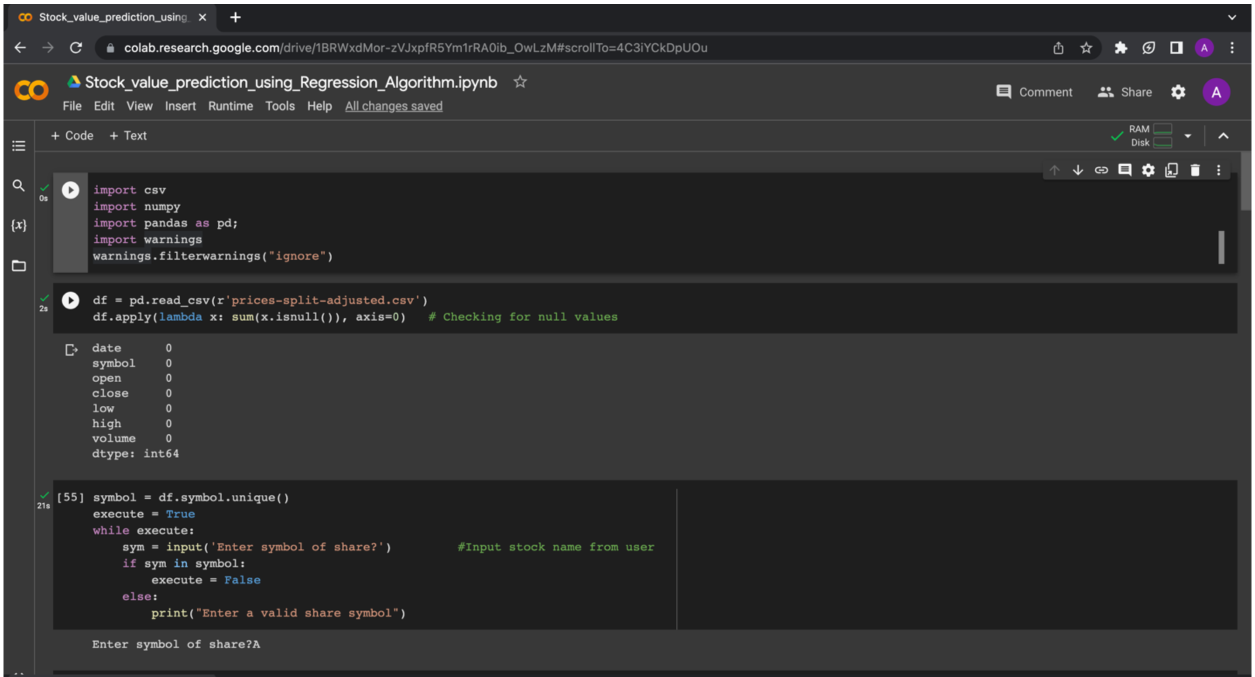
Stock Value Prediction Using Regression Algorithm

Output Screenshots:


Stock_value_prediction_using
colab.research.google.com/drive/1BRWxdMor-zVJxpfR5Ym1rRA0ib_OwLzM#scrollTo=4C3iYCkDpUOu
Stock_value_prediction_using_Regression_Algorithm.ipynb
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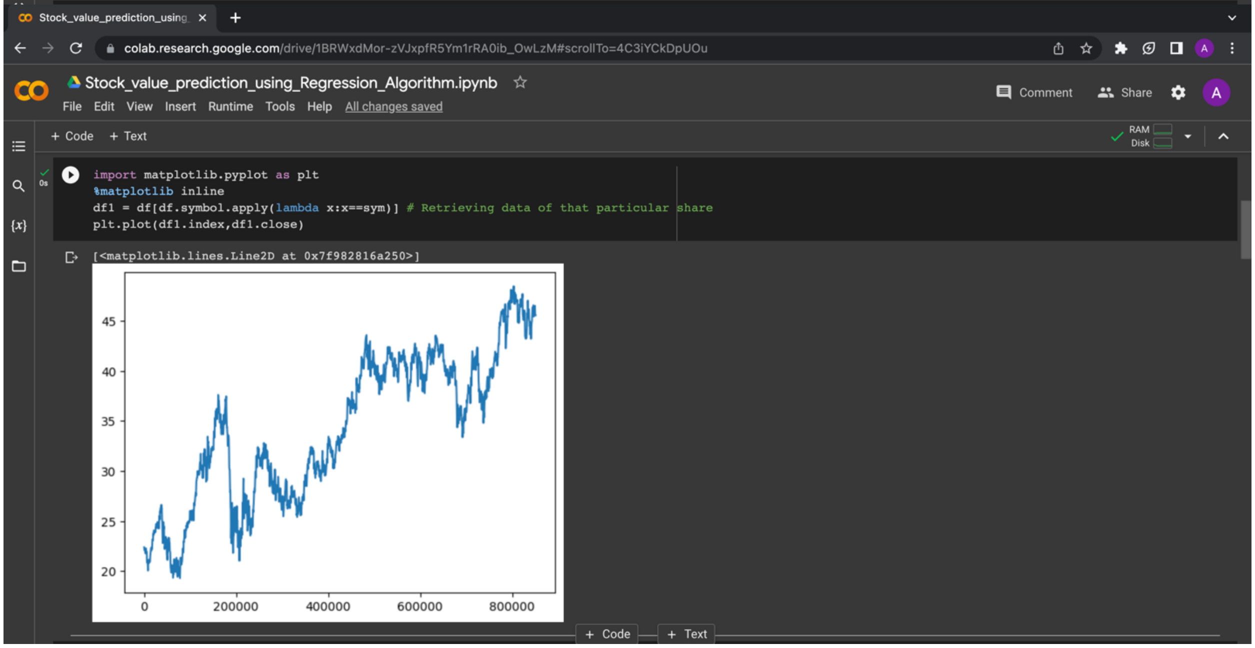
```
import csv
import numpy
import pandas as pd;
import warnings
warnings.filterwarnings("ignore")
```

```
df = pd.read_csv(r'prices-split-adjusted.csv')
df.apply(lambda x: sum(x.isnull()), axis=0)   # Checking for null values
```

```
date      0
symbol    0
open      0
close     0
low       0
high      0
volume    0
dtype: int64
```

```
[55] symbol = df.symbol.unique()
     execute = True
     while execute:
         sym = input('Enter symbol of share?')          #Input stock name from user
         if sym in symbol:
             execute = False
         else:
             print("Enter a valid share symbol")
```

```
Enter symbol of share?A
```


Stock_value_prediction_using
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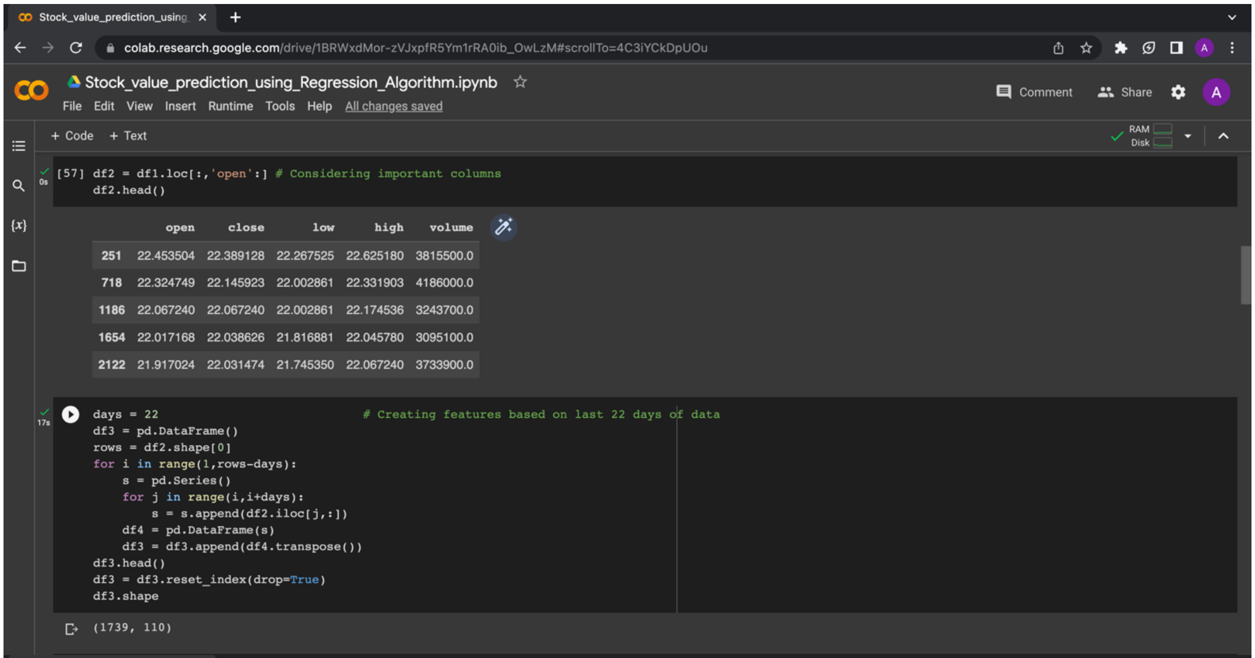
```
import matplotlib.pyplot as plt
%matplotlib inline
df1 = df[df.symbol.apply(lambda x:x==sym)] # Retrieving data of that particular share
plt.plot(df1.index,df1.close)
```

```
[<matplotlib.lines.Line2D at 0x7f982816a250>]
```


Stock_value_prediction_using
colab.research.google.com/drive/1BRWxdMor-zVJxpfR5Ym1rRA0ib_OwLzM#scrollTo=4C3iYCkDpUOu
Stock_value_prediction_using_Regression_Algorithm.ipynb
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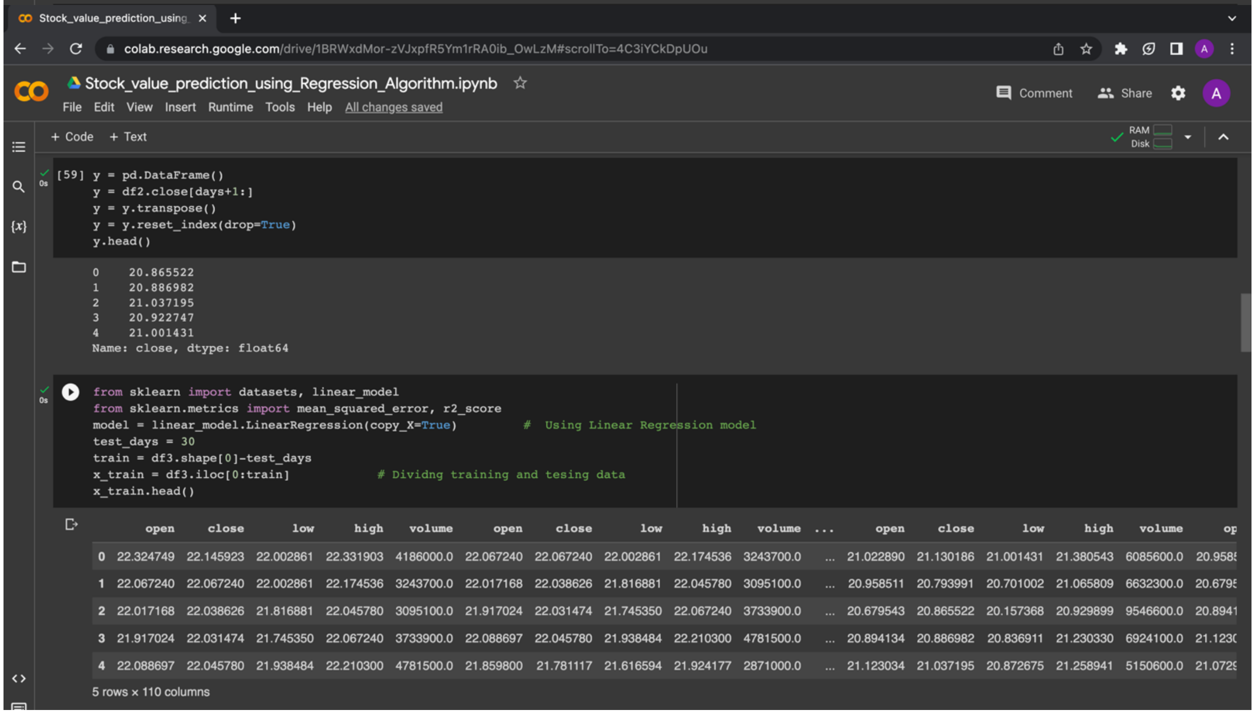
```
[57] df2 = df1.loc[:,'open':] # Considering important columns
     df2.head()
```

	open	close	low	high	volume
251	22.453504	22.389128	22.267525	22.625180	3815500.0
718	22.324749	22.145923	22.002861	22.331903	4186000.0
1186	22.067240	22.067240	22.002861	22.174536	3243700.0
1654	22.017168	22.038626	21.816881	22.045780	3095100.0
2122	21.917024	22.031474	21.745350	22.067240	3733900.0

```
days = 22                                     # Creating features based on last 22 days of data
df3 = pd.DataFrame()
rows = df2.shape[0]
for i in range(1,rows-days):
    s = pd.Series()
    for j in range(i,i+days):
        s = s.append(df2.iloc[j,:])
    df4 = pd.DataFrame(s)
    df3 = df3.append(df4.transpose())
df3.head()
df3 = df3.reset_index(drop=True)
df3.shape
```

```
(1739, 110)
```


Stock_value_prediction_using
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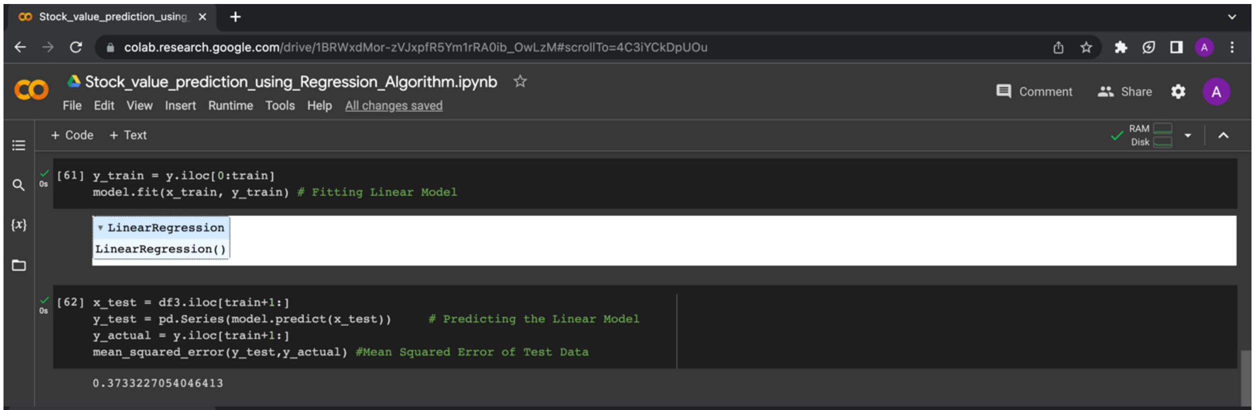
```
[59] y = pd.DataFrame()
     y = df2.close[days+1:]
     y = y.transpose()
     y = y.reset_index(drop=True)
     y.head()
```

```
0    20.865522
1    20.886982
2    21.037195
3    20.922747
4    21.001431
Name: close, dtype: float64
```

```
from sklearn import datasets, linear_model
from sklearn.metrics import mean_squared_error, r2_score
model = linear_model.LinearRegression(copy_X=True)         #  Using Linear Regression model
test_days = 30
train = df3.shape[0]-test_days
x_train = df3.iloc[0:train]            # Dividng training and tesing data
x_train.head()
```

	open	close	low	high	volume	open	close	low	high	volume	...	open	close	low	high	volume	op
0	22.324749	22.145923	22.002861	22.331903	4186000.0	22.067240	22.067240	22.002861	22.174536	3243700.0	...	21.022890	21.130186	21.001431	21.380543	6085600.0	20.958
1	22.067240	22.067240	22.002861	22.174536	3243700.0	22.017168	22.038626	21.816881	22.045780	3095100.0	...	20.958511	20.793991	20.701002	21.065809	6632300.0	20.679
2	22.017168	22.038626	21.816881	22.045780	3095100.0	21.917024	22.031474	21.745350	22.067240	3733900.0	...	20.679543	20.865522	20.157368	20.929899	9546600.0	20.8941
3	21.917024	22.031474	21.745350	22.067240	3733900.0	22.088697	22.045780	21.938484	22.210300	4781500.0	...	20.894134	20.886982	20.836911	21.230330	6924100.0	21.123
4	22.088697	22.045780	21.938484	22.210300	4781500.0	21.859800	21.781117	21.616594	21.924177	2871000.0	...	21.123034	21.037195	20.872675	21.258941	5150600.0	21.072

5 rows × 110 columns


Stock_value_prediction_using
colab.research.google.com/drive/1BRWxdMor-zVJxpfR5Ym1rRA0ib_OwLzM#scrollTo=4C3iYCkDpUOu
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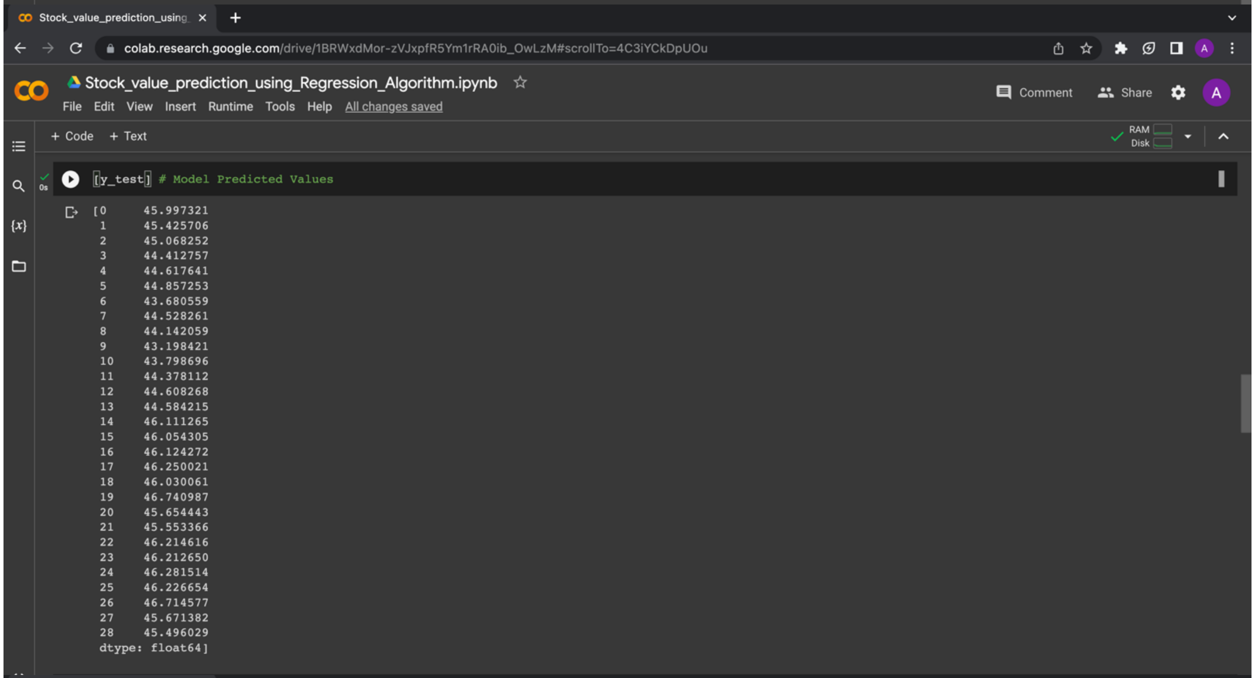
```
[61] y_train = y.iloc[0:train]
     model.fit(x_train, y_train) # Fitting Linear Model
```

```
▾ LinearRegression
LinearRegression()
```

```
[62] x_test = df3.iloc[train+1:]
     y_test = pd.Series(model.predict(x_test))     # Predicting the Linear Model
     y_actual = y.iloc[train+1:]
     mean_squared_error(y_test,y_actual) #Mean Squared Error of Test Data
```

```
0.3733227054046413
```


Stock_value_prediction_using
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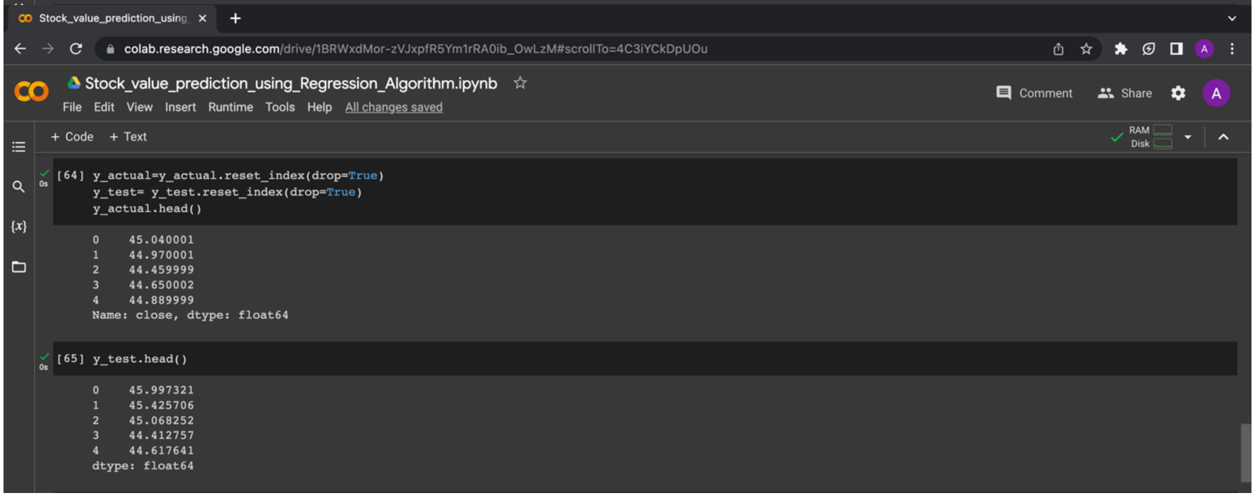
```
[y_test] # Model Predicted Values
```

```
[0     45.997321
 1     45.425706
 2     45.068252
 3     44.412757
 4     44.617641
 5     44.857253
 6     43.680559
 7     44.528261
 8     44.142059
 9     43.198421
 10    43.798696
 11    44.378112
 12    44.608268
 13    44.584215
 14    46.111265
 15    46.054305
 16    46.124272
 17    46.250021
 18    46.030061
 19    46.740987
 20    45.654443
 21    45.553366
 22    46.214616
 23    46.212650
 24    46.281514
 25    46.226654
 26    46.714577
 27    45.671382
 28    45.496029
 dtype: float64]
```


Stock_value_prediction_using
colab.research.google.com/drive/1BRWxdMor-zVJxpfR5Ym1rRA0ib_OwLzM#scrollTo=4C3iYCkDpUOu
Stock_value_prediction_using_Regression_Algorithm.ipynb
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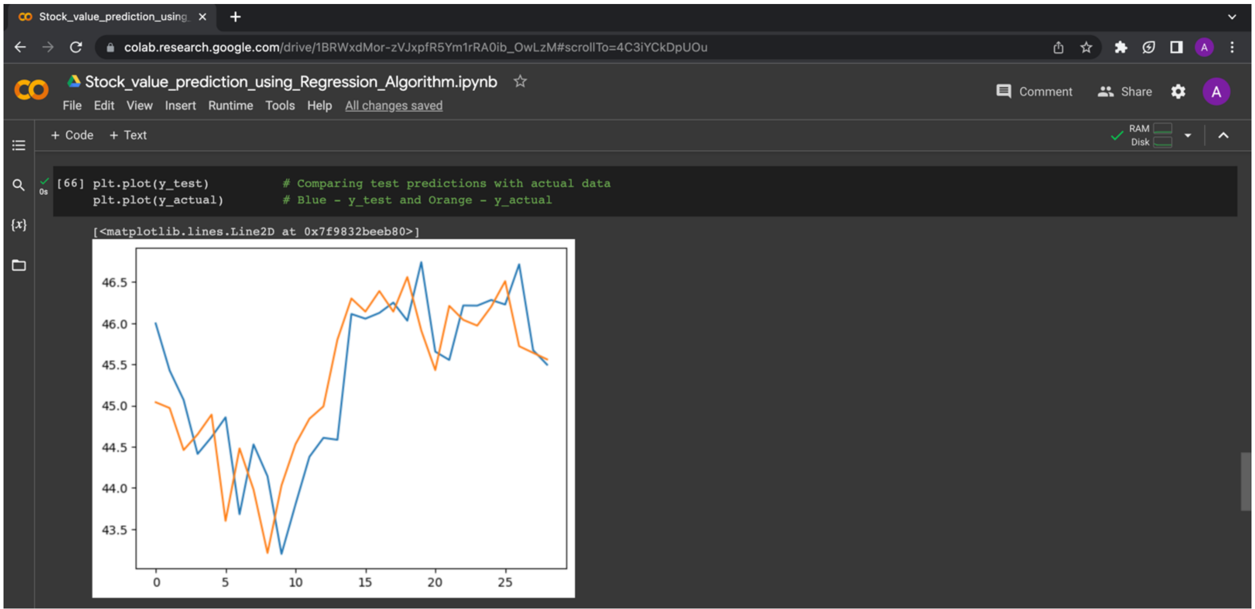
```
[64] y_actual=y_actual.reset_index(drop=True)
     y_test= y_test.reset_index(drop=True)
     y_actual.head()
```

```
0    45.040001
1    44.970001
2    44.459999
3    44.650002
4    44.889999
Name: close, dtype: float64
```

```
[65] y_test.head()
```

```
0    45.997321
1    45.425706
2    45.068252
3    44.412757
4    44.617641
dtype: float64
```


Stock_value_prediction_using
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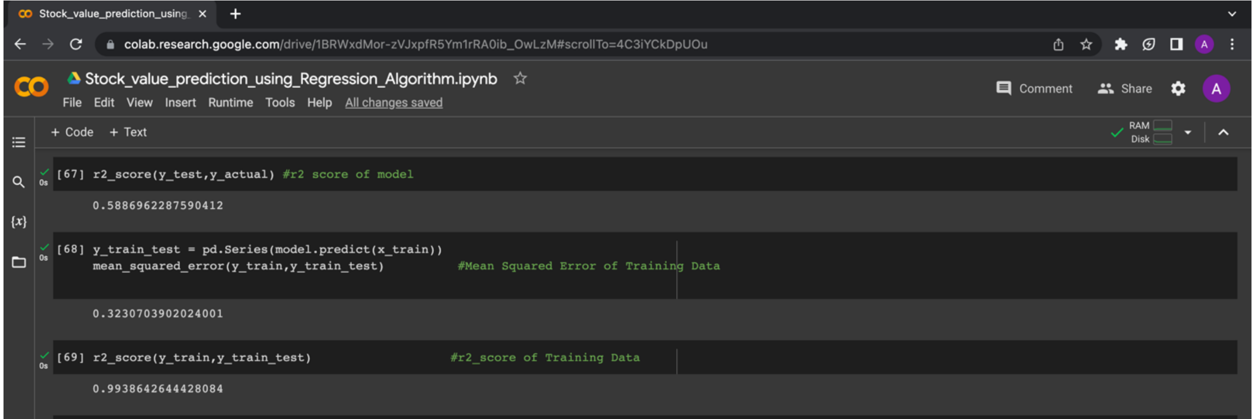
```
[66] plt.plot(y_test)          # Comparing test predictions with actual data
     plt.plot(y_actual)        # Blue - y_test and Orange - y_actual

[<matplotlib.lines.Line2D at 0x7f9832beeb80>]
```


Stock_value_prediction_using
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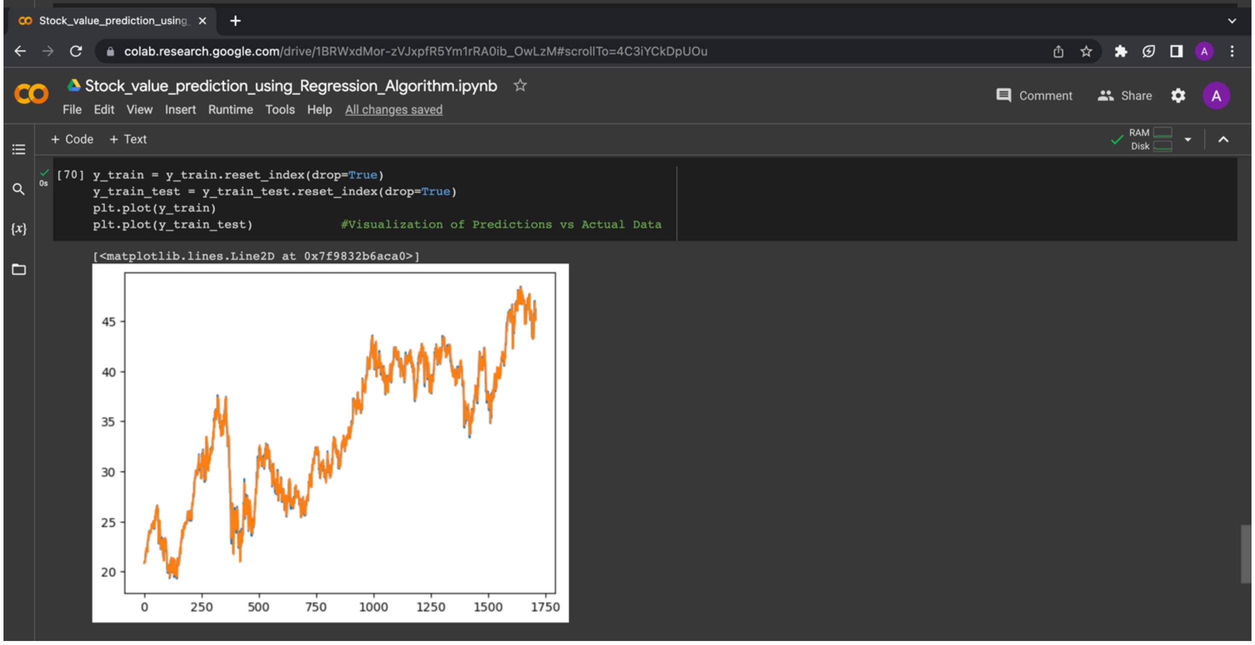
```
[67] r2_score(y_test,y_actual) #r2 score of model

0.5886962287590412

[68] y_train_test = pd.Series(model.predict(x_train))
     mean_squared_error(y_train,y_train_test)          #Mean Squared Error of Training Data

0.3230703902024001

[69] r2_score(y_train,y_train_test)                  #r2_score of Training Data

0.9938642644428084
```


Stock_value_prediction_using
colab.research.google.com/drive/1BRWxdMor-zVJxpfR5Ym1rRA0ib_OwLzM#scrollTo=4C3iYCkDpUOu
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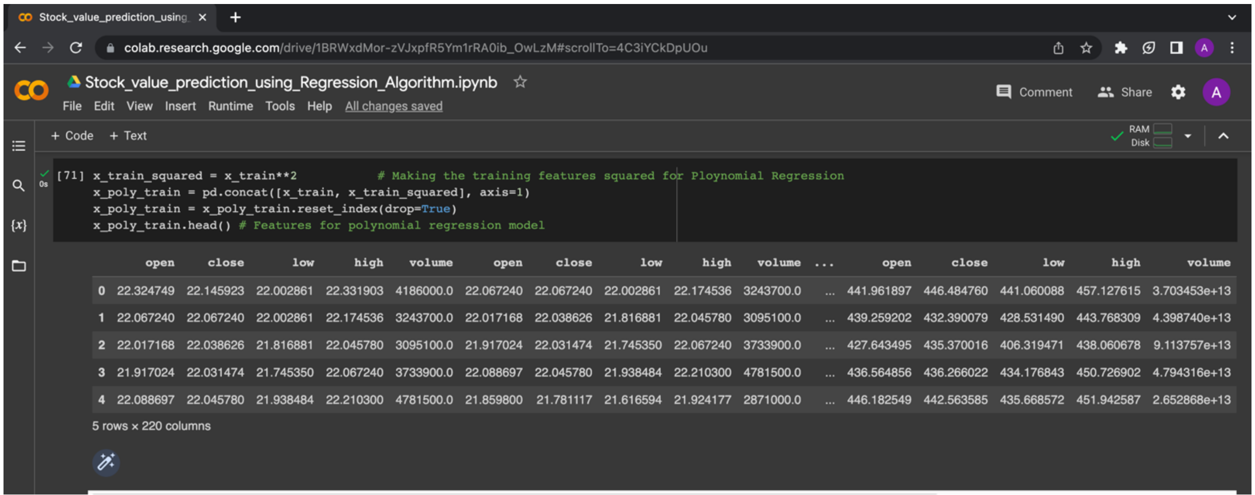
```
[70] y_train = y_train.reset_index(drop=True)
     y_train_test = y_train_test.reset_index(drop=True)
     plt.plot(y_train)
     plt.plot(y_train_test)           #Visualization of Predictions vs Actual Data

[<matplotlib.lines.Line2D at 0x7f9832b6aca0>]
```


Stock_value_prediction_using
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Stock_value_prediction_using_Regression_Algorithm.ipynb
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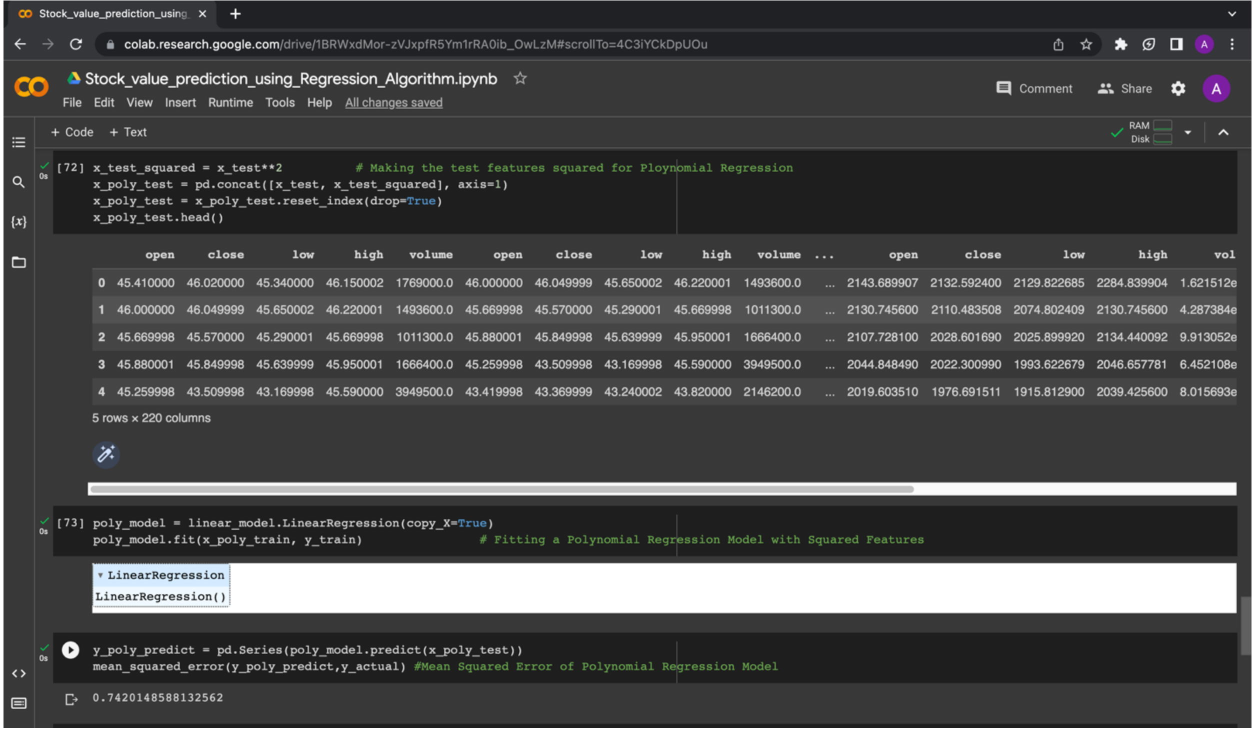
```
[71] x_train_squared = x_train**2           # Making the training features squared for Ploynomial Regression
     x_poly_train = pd.concat([x_train, x_train_squared], axis=1)
     x_poly_train = x_poly_train.reset_index(drop=True)
     x_poly_train.head() # Features for polynomial regression model
```

	open	close	low	high	volume	open	close	low	high	volume	...	open	close	low	high	volume
0	22.324749	22.145923	22.002861	22.331903	4186000.0	22.067240	22.067240	22.002861	22.174536	3243700.0	...	441.961897	446.484760	441.060088	457.127615	3.703453e+13
1	22.067240	22.067240	22.002861	22.174536	3243700.0	22.017168	22.038626	21.816881	22.045780	3095100.0	...	439.259202	432.390079	428.531490	443.768309	4.398740e+13
2	22.017168	22.038626	21.816881	22.045780	3095100.0	21.917024	22.031474	21.745350	22.067240	3733900.0	...	427.643495	435.370016	406.319471	438.060678	9.113757e+13
3	21.917024	22.031474	21.745350	22.067240	3733900.0	22.088697	22.045780	21.938484	22.210300	4781500.0	...	436.564856	436.266022	434.176843	450.726902	4.794316e+13
4	22.088697	22.045780	21.938484	22.210300	4781500.0	21.859800	21.781117	21.616594	21.924177	2871000.0	...	446.182549	442.563585	435.668572	451.942587	2.652868e+13

5 rows × 220 columns


Stock_value_prediction_using
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Stock_value_prediction_using_Regression_Algorithm.ipynb
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Comment
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```
[72] x_test_squared = x_test**2           # Making the test features squared for Ploynomial Regression
     x_poly_test = pd.concat([x_test, x_test_squared], axis=1)
     x_poly_test = x_poly_test.reset_index(drop=True)
     x_poly_test.head()
```

	open	close	low	high	volume	open	close	low	high	volume	...	open	close	low	high	vol
0	45.410000	46.020000	45.340000	46.150002	1769000.0	46.000000	46.049999	45.650002	46.220001	1493600.0	...	2143.689907	2132.592400	2129.822685	2284.839904	1.621512e
1	46.000000	46.049999	45.650002	46.220001	1493600.0	45.669998	45.570000	45.290001	45.669998	1011300.0	...	2130.745600	2110.483508	2074.802409	2130.745600	4.287384e
2	45.669998	45.570000	45.290001	45.669998	1011300.0	45.880001	45.849998	45.639999	45.950001	1666400.0	...	2107.728100	2028.601690	2025.899920	2134.440092	9.913052e
3	45.880001	45.849998	45.639999	45.950001	1666400.0	45.259998	43.509998	43.169998	45.590000	3949500.0	...	2044.848490	2022.300990	1993.622679	2046.657781	6.452108e
4	45.259998	43.509998	43.169998	45.590000	3949500.0	43.419998	43.369999	43.240002	43.820000	2146200.0	...	2019.603510	1976.691511	1915.812900	2039.425600	8.015693e

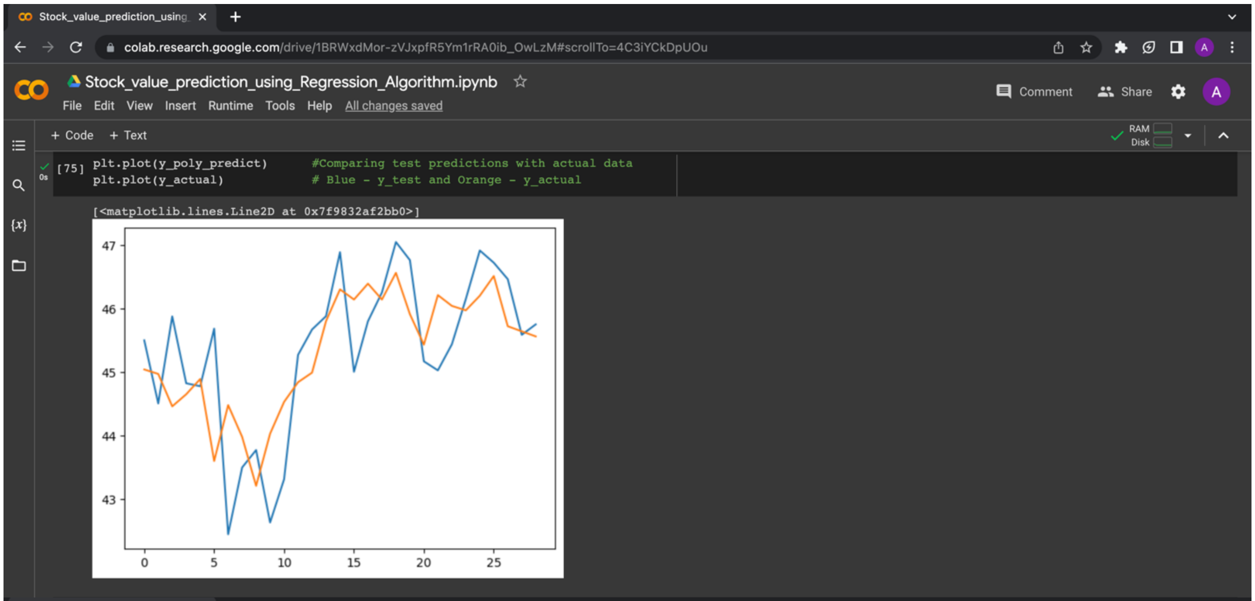
5 rows × 220 columns

```
[73] poly_model = linear_model.LinearRegression(copy_X=True)
     poly_model.fit(x_poly_train, y_train)                # Fitting a Polynomial Regression Model with Squared Features
```

```
▾ LinearRegression
LinearRegression()
```

```
y_poly_predict = pd.Series(poly_model.predict(x_poly_test))
mean_squared_error(y_poly_predict,y_actual) #Mean Squared Error of Polynomial Regression Model
```

```
0.7420148588132562
```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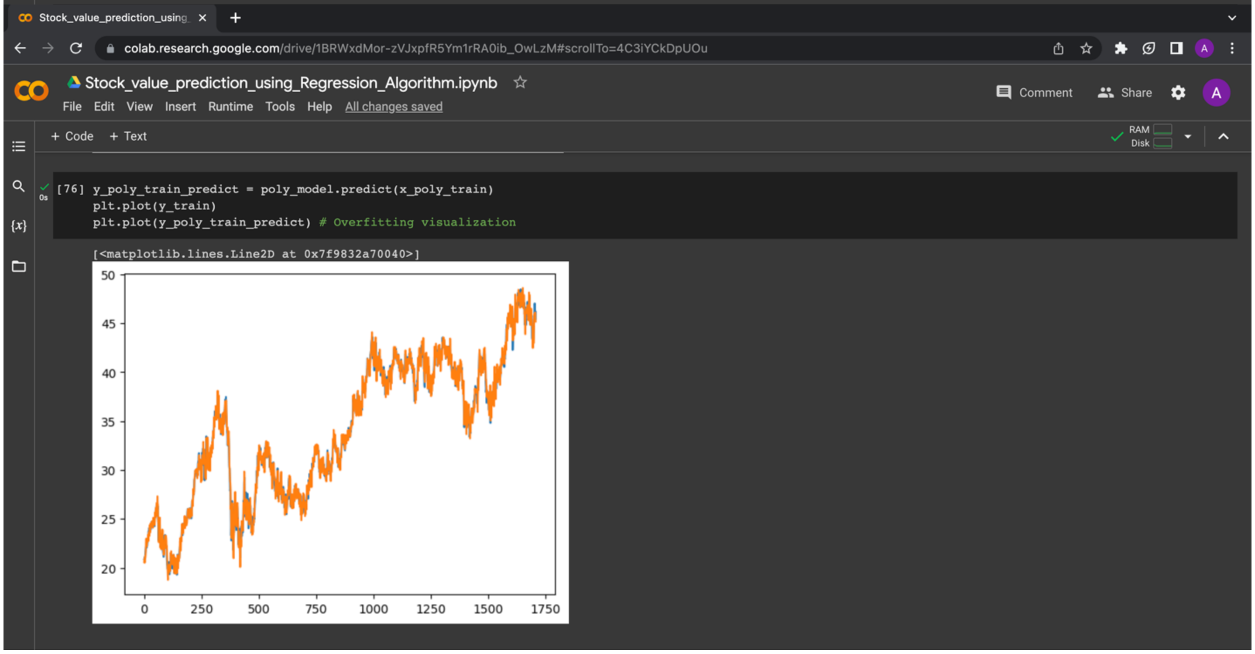
```
[75] plt.plot(y_poly_predict)       #Comparing test predictions with actual data
     plt.plot(y_actual)             # Blue - y_test and Orange - y_actual
```

```
[<matplotlib.lines.Line2D at 0x7f9832af2bb0>]
```


Stock_value_prediction_using
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1750

```
[76] y_poly_train_predict = poly_model.predict(x_poly_train)
     plt.plot(y_train)
     plt.plot(y_poly_train_predict) # Overfitting visualization
```

```
[<matplotlib.lines.Line2D at 0x7f9832a70040>]
```