STOCK PREDICTING NOTEBOOK PROJECT II

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STOCK PREDICTING NOTEBOOK

- AIMS TO EVALUATE DIFFERENT TECHNICAL INDICATORS AND MACHINE LEARNING MODELS TO IMPROVE TRADING STRATEGIES
- INCLUDES SVM AND LOGISTIC REGRESSION ML AND SMA, MACD, BOLLINGER BANDS, AND RSI AS FEATURES

THE STOCK PREDICTING NOTEBOOK USES VARIOUS FUNCTIONS AND PACKAGES TO CREATE AN ALGORITHMIC TRADING BOT

WRITTEN IN PYTHON 3.9.7 AND USES THE FOLLOWING LIBRARIES:

- pandas – to analyze and manipulate data
- Random – generates a random float uniformly in the semi-open range
- NumPy – to operate on large collection of high-level mathematical functions
- Statsmodels API – to easily develop rapid trading algo
- sklearn – features various classification, regression and clustering algorithms including support-vector machines, random forests, gradient boosting, k-means and DBSCAN
- hvplot – for user friendly interactive plotting

DATA SOURCE

Used CSV files to obtain historical price data from Yahoo Finance

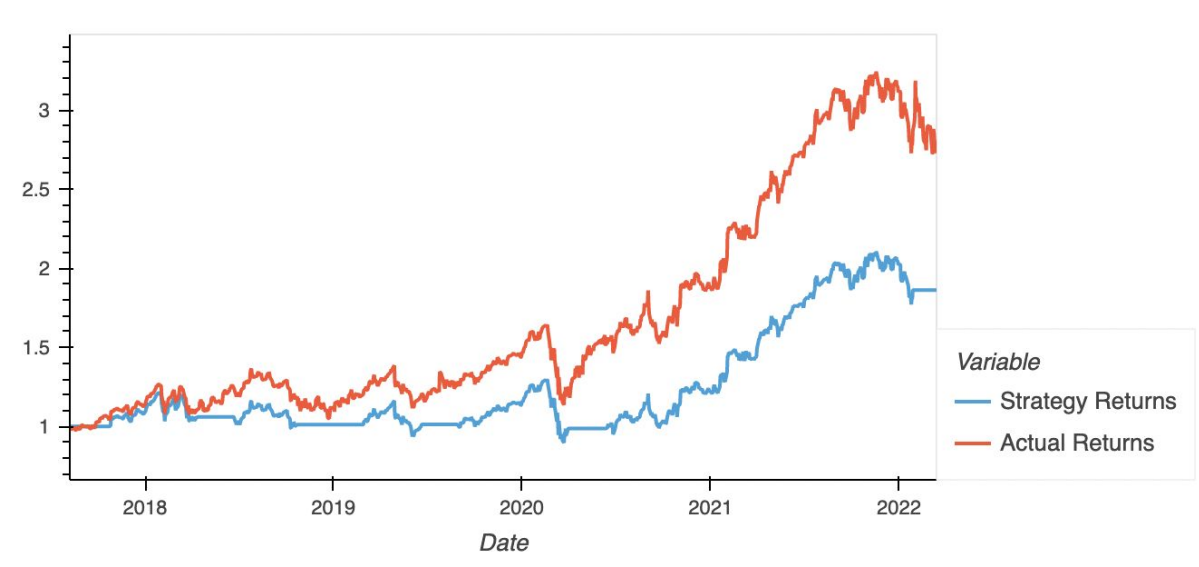
THIS NOTEBOOK ANALYZES 2 STOCKS

```
# Import the GOOG.csv into a Pandas Dataframe
goog_df = pd.read_csv(Path("GOOG.csv"),
                      index_col='Date',
                      infer_datetime_format=True,
                      parse_dates=True)

# Review the DataFrame
goog_df.head()
```

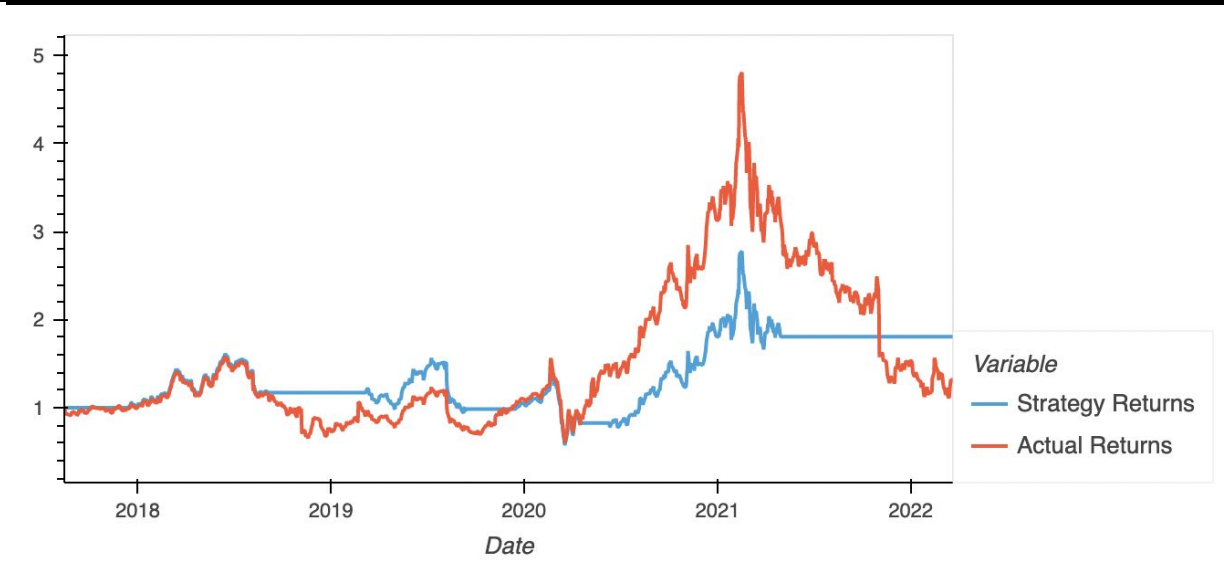
```
# Import the Z.csv into a Pandas Dataframe
zillow_df = pd.read_csv(Path("Z.csv"),
                        index_col='Date',
                        infer_datetime_format=True,
                        parse_dates=True)

# Review the DataFrame
zillow_df.head()
```

VISUALIZATIONS

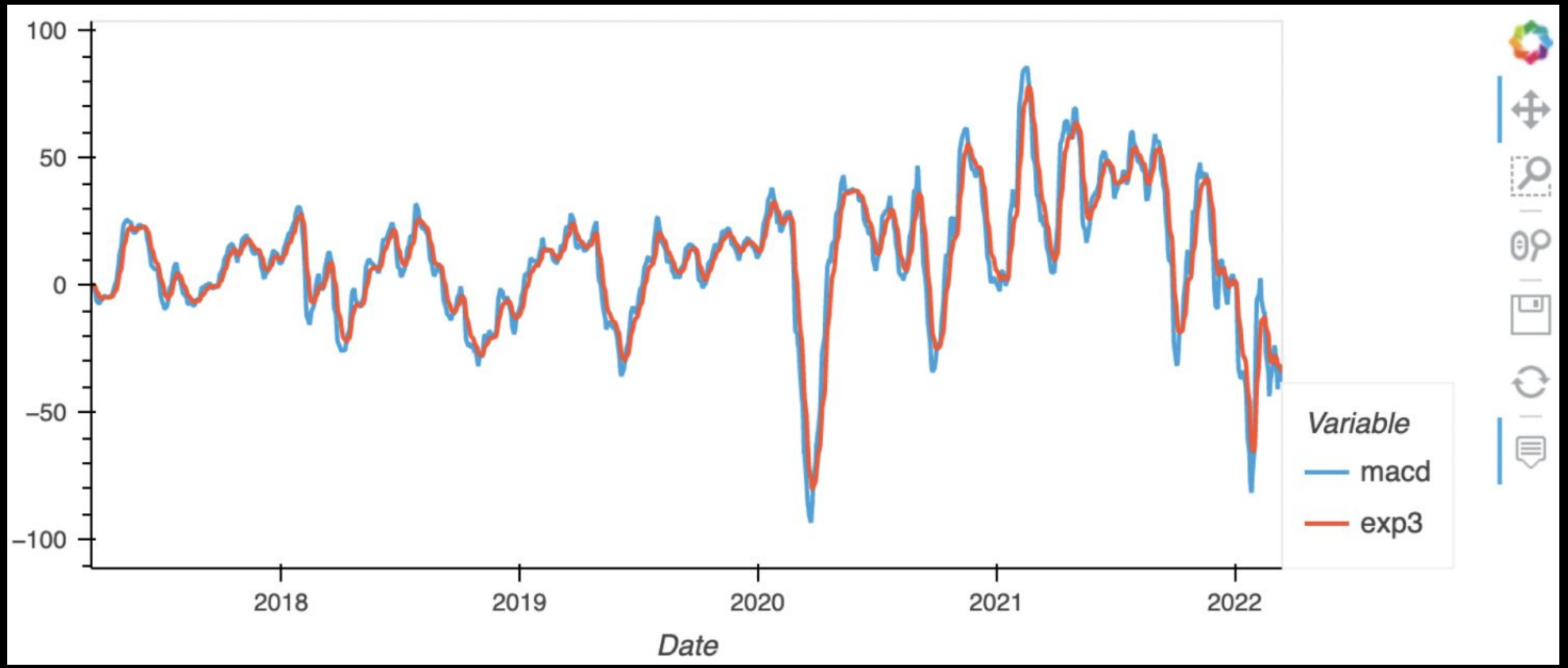
Google Actual Returns vs. Strategy Returns



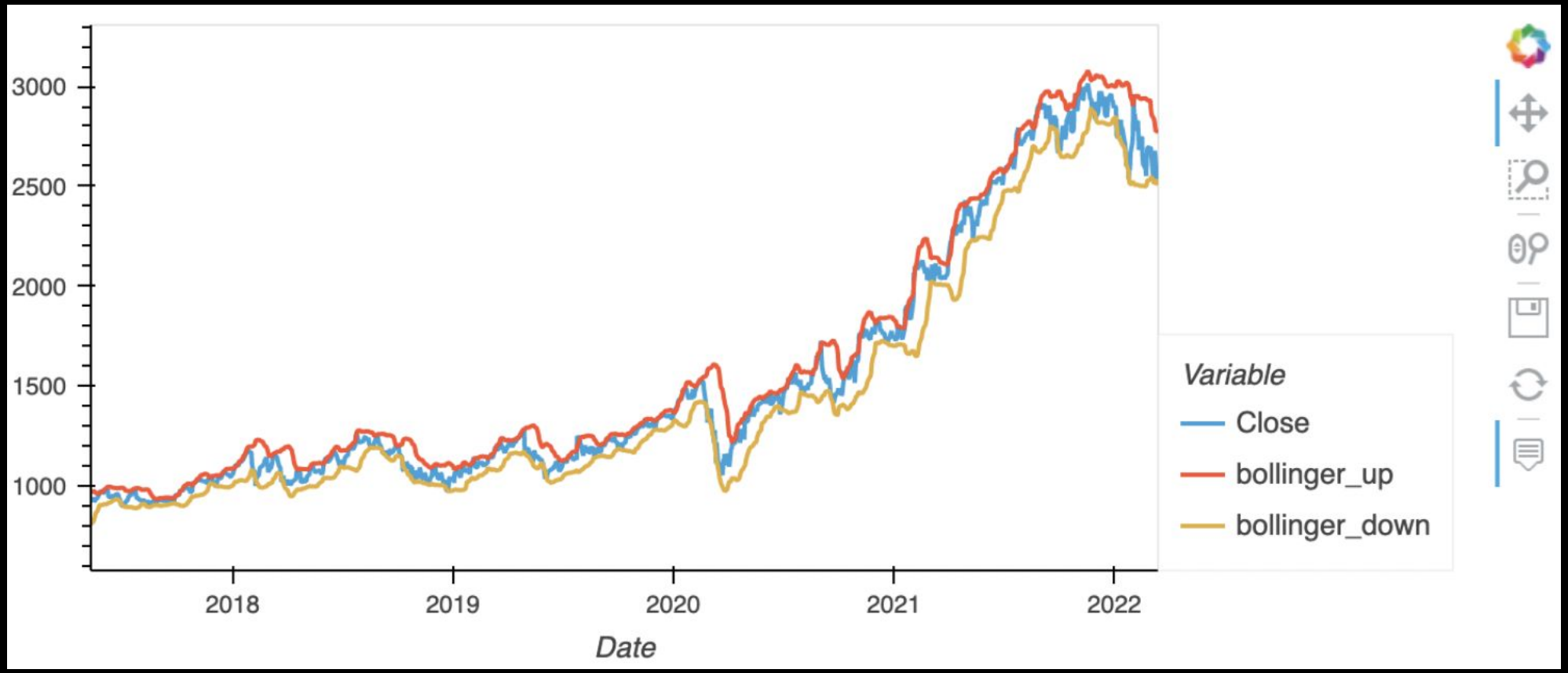
Zillow Actual Returns vs. Strategy Returns



Google with MACD technical indicator



Google with Bollinger bands as technical indicators



Google - MACD testing period

Google - Bollinger Bands testing period

CLASSIFICATION REPORTS

SVM Testing Report - Google

	precision	recall	f1-score	support
-1.0	0.00	0.00	0.00	495
1.0	0.55	1.00	0.71	599
accuracy			0.55	1094
macro avg	0.27	0.50	0.35	1094
weighted avg	0.30	0.55	0.39	1094

SVM Testing Report - Zillow

	precision	recall	f1-score	support
-1.0	0.48	0.92	0.63	521
1.0	0.54	0.09	0.15	572
accuracy			0.48	1093
macro avg	0.51	0.50	0.39	1093
weighted avg	0.51	0.48	0.38	1093

Google - MACD testing period

	precision	recall	f1-score	support
-1.0	0.38	0.01	0.02	540
1.0	0.55	0.98	0.70	653
accuracy			0.54	1193
macro avg	0.46	0.50	0.36	1193
weighted avg	0.47	0.54	0.39	1193

Google - Bollinger Bands testing period

	precision	recall	f1-score	support
-1.0	0.25	0.00	0.01	522
1.0	0.55	0.99	0.70	633
accuracy			0.54	1155
macro avg	0.40	0.50	0.36	1155
weighted avg	0.41	0.54	0.39	1155

Zillow - MACD testing period

	precision	recall	f1-score	support
-1.0	0.00	0.00	0.00	574
1.0	0.52	1.00	0.68	617
accuracy			0.52	1191
macro avg	0.26	0.50	0.34	1191
weighted avg	0.27	0.52	0.35	1191

Zillow - Bollinger Bands testing period

	precision	recall	f1-score	support
-1.0	0.37	0.05	0.09	553
1.0	0.51	0.91	0.66	601
accuracy			0.50	1154
macro avg	0.44	0.48	0.38	1154
weighted avg	0.44	0.50	0.39	1154

RSI

α

$$RS = \frac{Avg.Gain}{Avg.Loss}$$

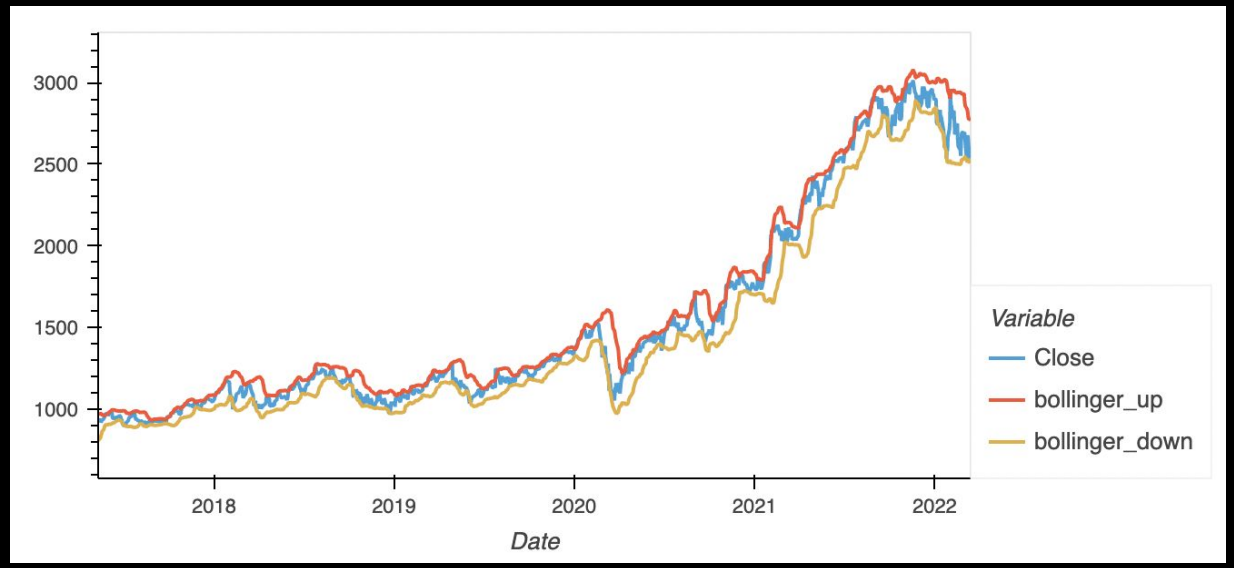
$$RSI = 100 - \frac{100}{1 + RS}$$


3000
2500
2000
1500
1000
60
40
20
2018
2019
2020
2021
2022

NEXT POTENTIAL STEPS

Test trading signals using MACD, Bollinger Bands, and RSI for cumulative returns using historical data

CONCLUSION



Machine learning of historical stock price time series using different technical innovations can provide support for picking trading signals

THANK YOU

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