

# Movement Prediction

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STOCK MARKET

# Is Finance Art or Science?

## **Art**

Many successful traders in the world does not have a justification on why the buy or sell stocks. They just use their own “intuition”

## **Science**

There is an algorithm that can be used to predict the movement of the stock prices

# Data Sources

## Alpha Vantage API

- Daily Closing Prices
- Volumes

## Yahoo Finance

- EUR/USD Exchange Rates

## Federal Reserve Bank of St. Louis

- Effective Federal Interest Rates

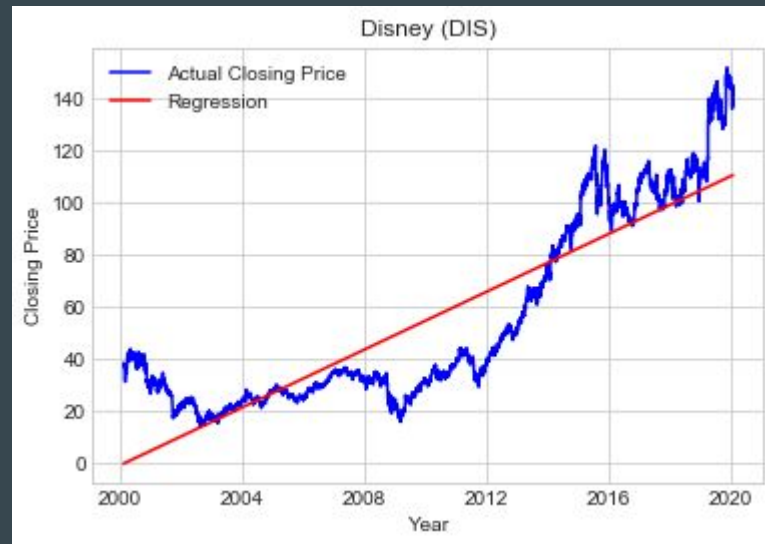
# The Walt Disney Company (DIS)

- Founded in 1923 by Walt Disney and his brothers
- 2 public offerings: 1940 and 1957
- As of Feb 3, 2020, its market value is at \$255 billion with price of \$141.26 per share
- Industry: Movies/Entertainment

# Exploratory Data Analysis (EDA)

## Linear Regression

- Does not fit the actual data quite well
- High RMSE: 17.69



# Machine Learning

## Split the data into training vs test

- Train data: beginning of 2000 to end of 2019
- Test data: beginning of 2020 to present

## Explanatory variables

1. Trading Volume
2. Effective Federal Interest Rates
3. EUR/USD Exchange Rates

# Moving Averages

- Cannot predict the future values of the features
- 3 Days Simple Moving Averages
- Implement on test dataset

# Machine Learning

## Method: Random Forest Classifier

- 1 estimator has the highest accuracy but overestimate the number of transactions
- 2 and 10 estimators give the same accuracy
  - 2 estimators - underestimate the transactions
  - 10 estimators is chosen

Estimator	Accuracy	Transactions
1	0.818182	12
2	0.795455	5
3	0.772727	8
4	0.772727	6
5	0.772727	6
10	0.795455	9
50	0.750000	11
100	0.750000	11
200	0.750000	11
500	0.750000	11



# Results

9 days that Disney stocks outperform the SP500

- January 14, 2020
- February 4, 2020
- February 24, 2020
- February 25, 2020
- March 2, 2020
- March 3, 2020
- March 5, 2020
- March 6, 2020
- March 10, 2020

**THANK YOU**