



# Stock Price Prediction

APMA 4990

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# Problem Statement

- 1 Stock prices can be volatile and fluctuate daily
- 2 Quantitative trading is used by many financial institutions and hedge funds
- 3 Goal is to use machine learning models to predict future stock prices based on past data to form a buy/sell decision



# >>> Dataset - NASDAQ: GOOG

Date	Open	High	Low	Close	Adj Close	Volume	50 Day MA	200 Day MA
1/3/2017	778.81	789.63	775.80	786.14	786.14	1657300	778.11	751.87
1/4/2017	788.36	791.34	783.16	786.90	786.90	1073000	777.86	752.10
1/5/2017	786.08	794.48	785.02	794.02	794.02	1335200	777.48	752.36
1/6/2017	795.26	807.90	792.20	806.15	806.15	1640200	777.45	752.70
1/9/2017	806.40	809.97	802.83	806.65	806.65	1272400	777.60	753.06
1/10/2017	807.86	809.13	803.51	804.79	804.79	1176800	777.79	753.42
1/11/2017	805.00	808.15	801.37	807.91	807.91	1065900	778.04	753.73
1/12/2017	807.14	807.39	799.17	806.36	806.36	1353100	778.48	754.01
1/13/2017	807.48	811.22	806.69	807.88	807.88	1099200	778.96	754.33
1/17/2017	807.08	807.14	800.37	804.61	804.61	1355800	779.68	754.60
1/18/2017	805.81	806.21	800.99	806.07	806.07	1294400	780.56	754.90
1/19/2017	805.12	809.48	801.80	802.17	802.17	919300	781.37	755.22
1/20/2017	806.91	806.91	801.69	805.02	805.02	1670000	781.82	755.52
1/23/2017	807.25	820.87	803.74	819.31	819.31	1963600	782.39	755.92
1/24/2017	822.30	825.90	817.82	823.87	823.87	1474000	783.16	756.34
1/25/2017	829.62	835.77	825.06	835.67	835.67	1494500	784.62	756.84
1/26/2017	837.81	838.00	827.01	832.15	832.15	2973900	786.19	757.28
1/27/2017	834.71	841.95	820.44	823.31	823.31	2965800	787.93	757.64
1/30/2017	814.66	815.84	799.80	802.32	802.32	3246600	788.81	757.89



# »» Dataset

1. CSV file downloaded from Yahoo Finance from January 2017 to March 2018



2. Basic Features from downloaded data include

- Open
- Close
- High
- Volume
- Low



3. Additional Features are added:

- 50 day moving average
- 200 day moving average
- Daily Percent Change
- Daily High-Low fluctuation



- Several S&P500 stock datasets will be used for final web app

## »» Method

- 1 Several Machine Learning models will be tested with the dataset
  - Random Forest Regression
  - Gradient Boosting
  - ARIMA Model
  - Recurrent Neural Network
- 2 Model will predict price ( $y$ ) for a number of days beyond the current dataset
- 3 With the predicted price, a buy/sell decision will be output

Thanks for listening!

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