Stock Trend Prediction

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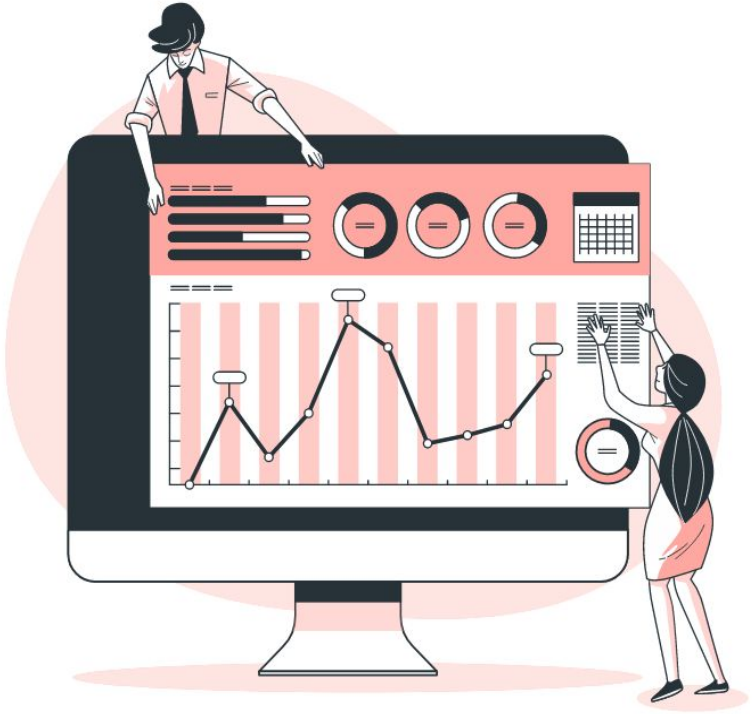


Introduction

Motivation

Recent interest in automated stock trading

Objectives

Compare various models and pick out the best model

Goal

Able to predict the trend of a given stock

Approach

Two ways to attempt to predict Stock price prediction

Fundamental Analysis

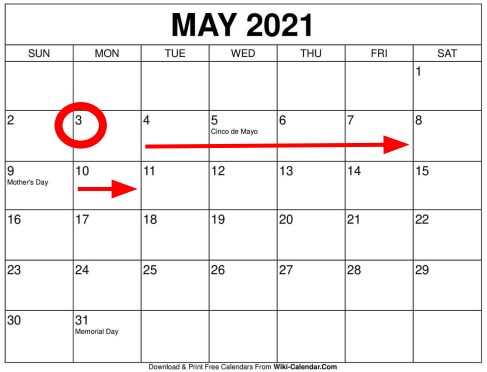
VS

Technical Analysis

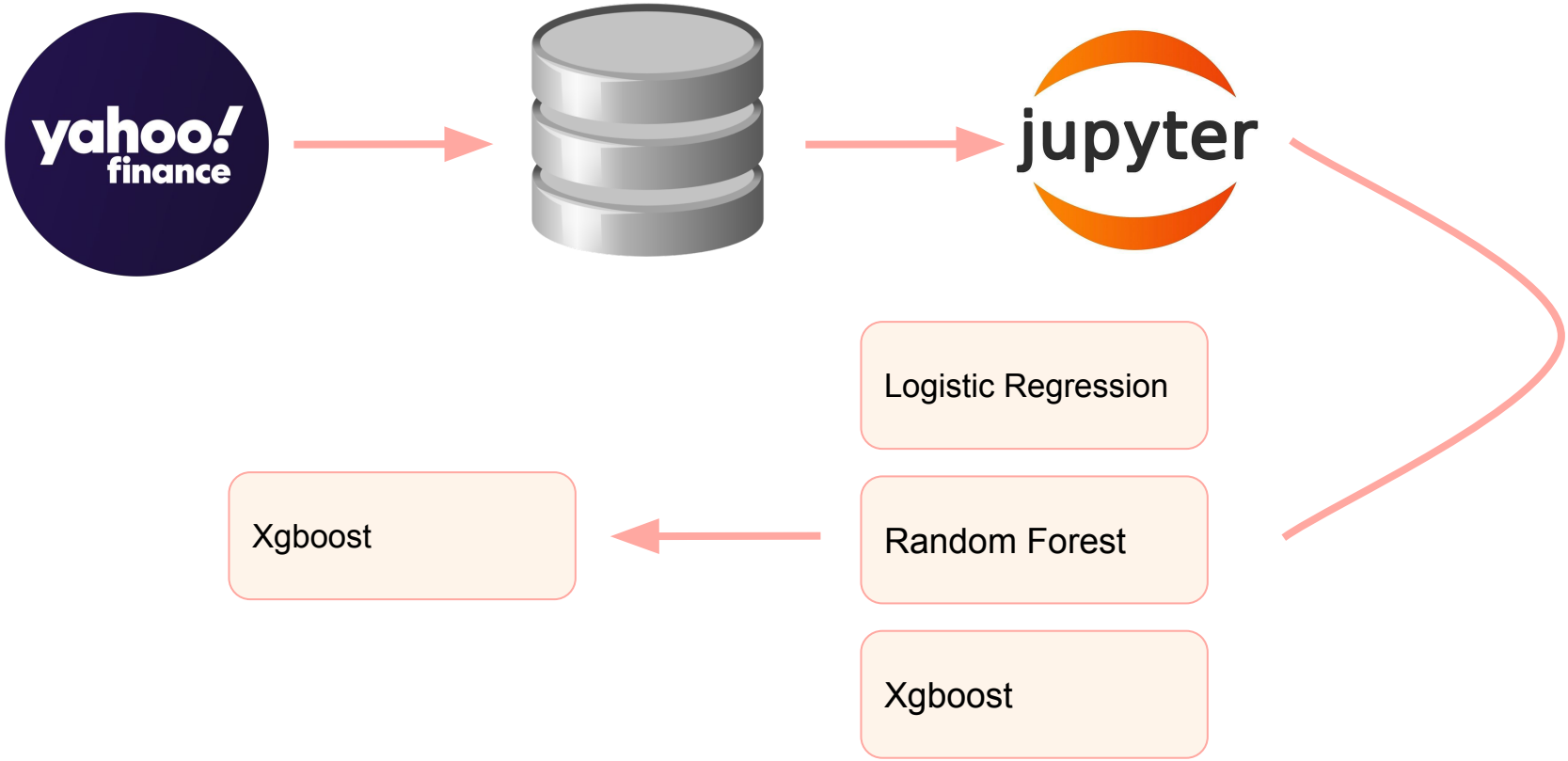
DATA

- Daily information of 502 stocks listed in S&P 500
- 349,948 data points were gathered. (2018-07-13 ~ 2021-04-26)
- 89 features (independent variable)
- Trend as target variable
- Trend = 1 -> upward trend, 0 -> downward trend

Ex) For 2021-05-03, mean of the percentage change in close price.



Workflow


yahoo! finance
jupyter
Logistic Regression
Random Forest
Xgboost
Xgboost

Feature Engineering

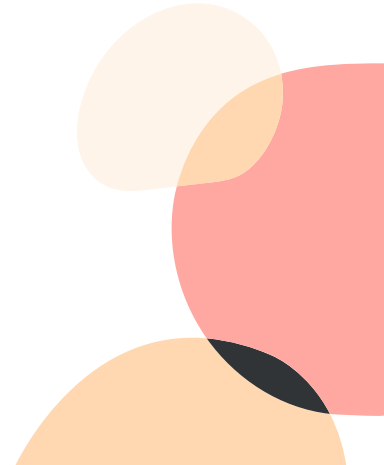
Technical Analysis Library

Importance features in Xgboost:

Volatility

Trend Mass Index

Price Rate of Change Indicator

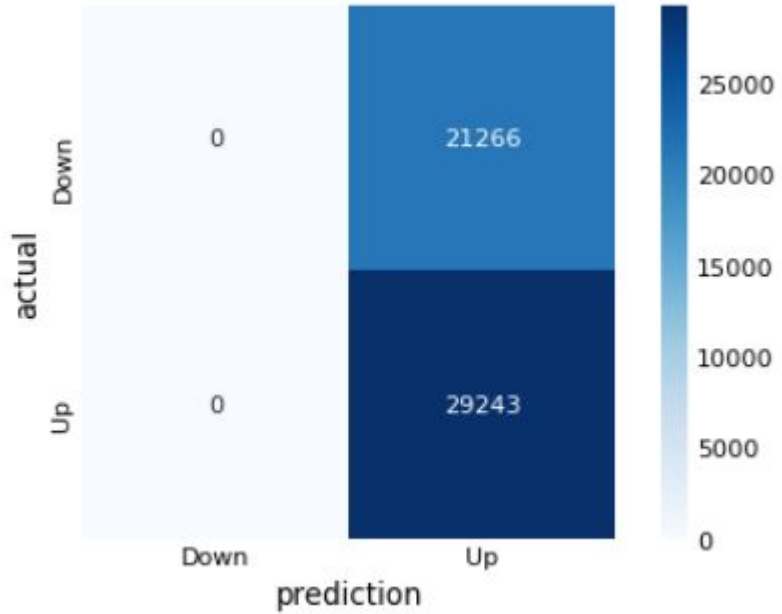


Modeling

First model prior to any data manipulation

Simple Validation train:test = 0.8:0.2

Logistic regression
Acc = 0.5789



Modeling

Logistic Regression

Acc = 0.5484

4831	24476
6845	33205

Random Forest

Acc = 0.5205

13360	15947
18074	21976

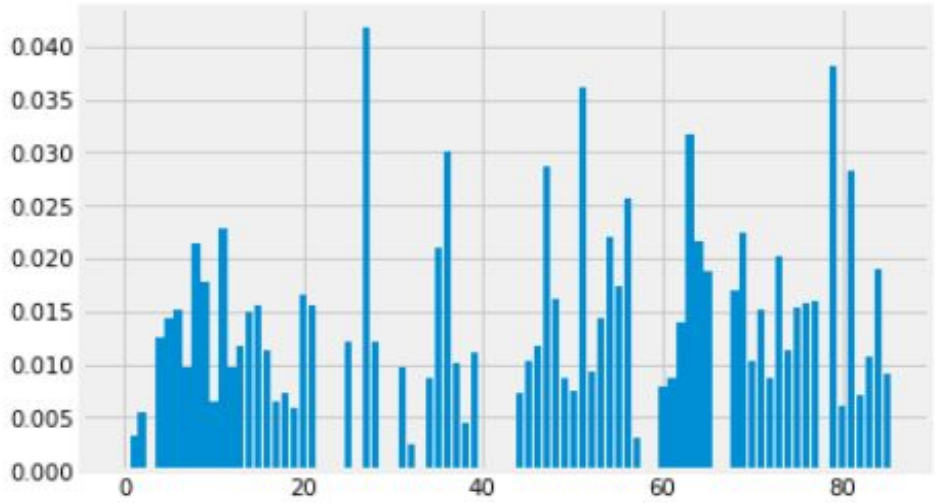
Modeling - Final

Xgboost

Acc = 0.5525

2983	26324
4676	35374

Feature Importance



Model Application

If the model predicts that it will be a Rising trend -> buy stock
Falling trend -> short position of stock

From correct prediction sum of returns = 137542.6297

From failed prediction sum of losses = 96561.1508

Future Work

Apply LSTM to incorporate time factor

Use of cross validation in each model