Criterion B: Solution Overview

Word Count: 375

Graphical User Interface (GUI)

Figure 1- Beginning Display/Home Page

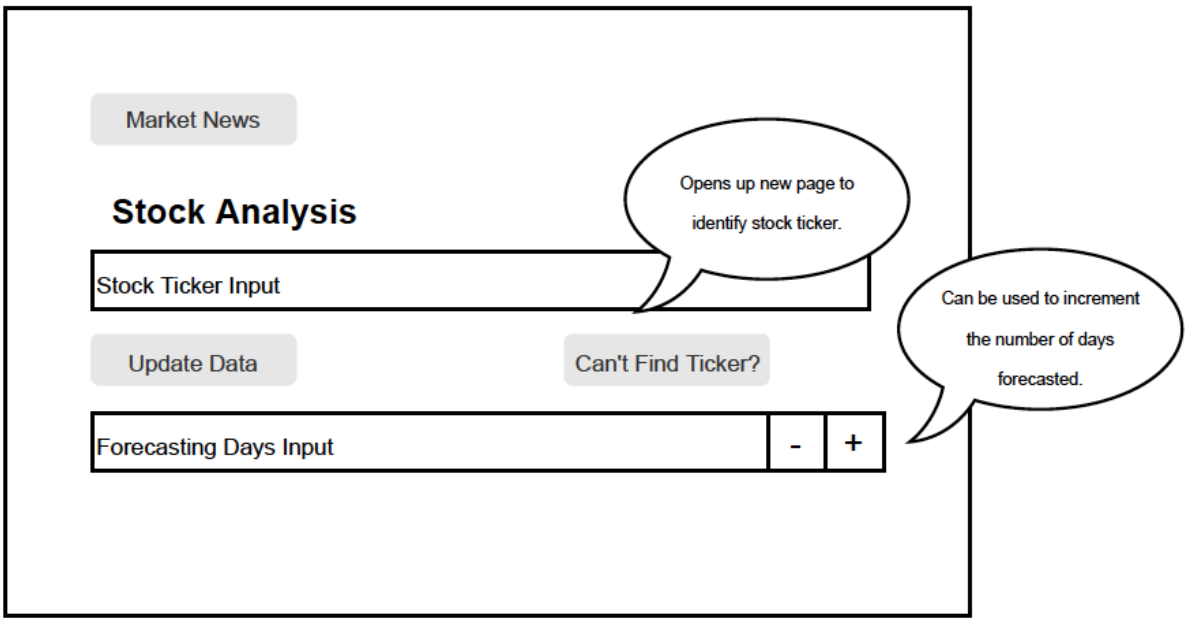


Figure 2- Market News Display

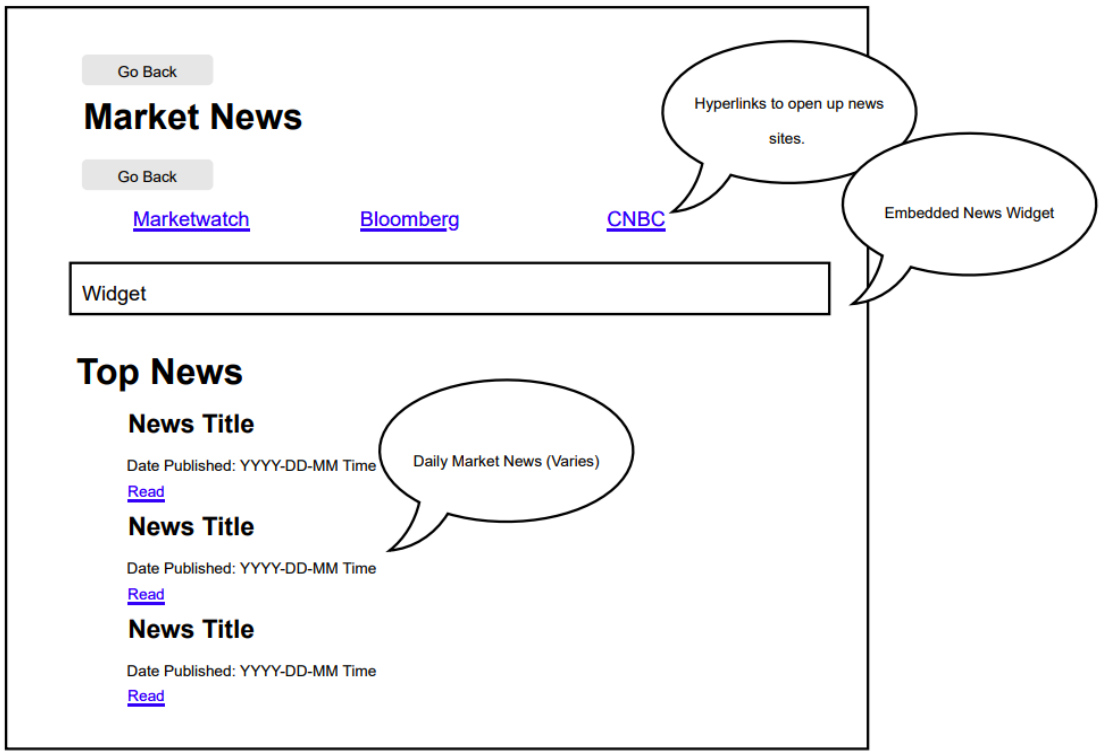


Figure 3.1 Stock Analysis Display

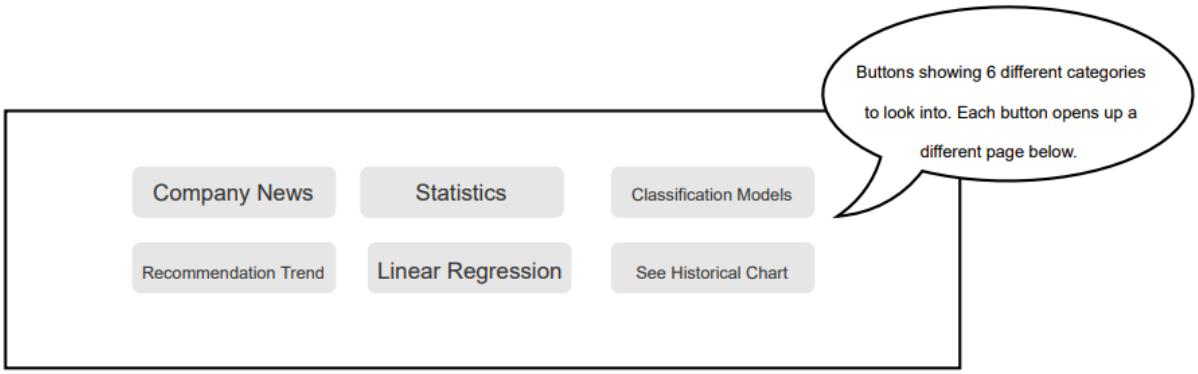


Figure 3.2 Stock Analysis Display (Version 2)

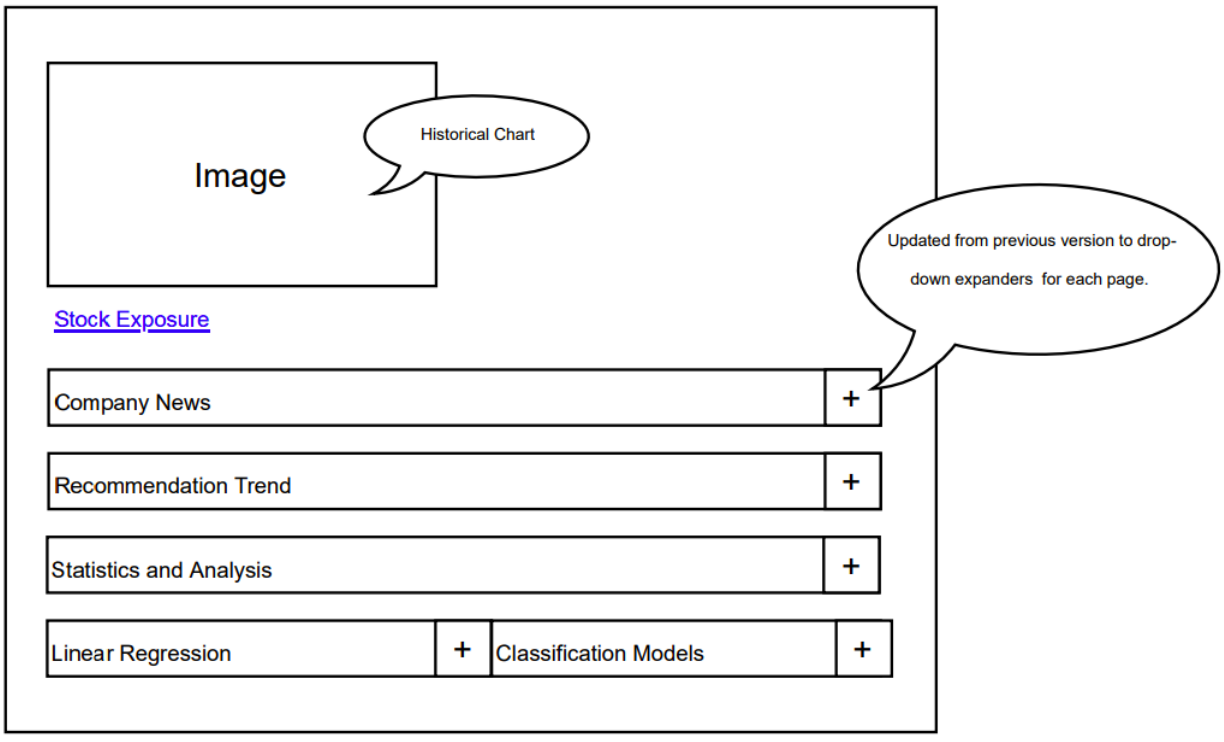


Figure 4 Company News Dropdown Display

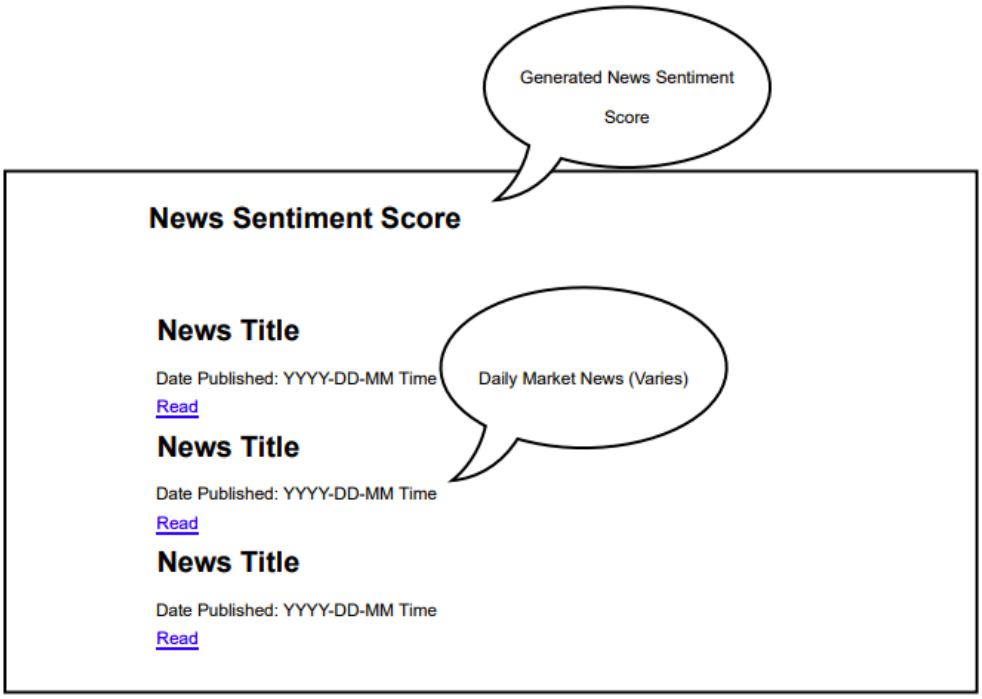


Figure 5 Peer Companies Dropdown Display

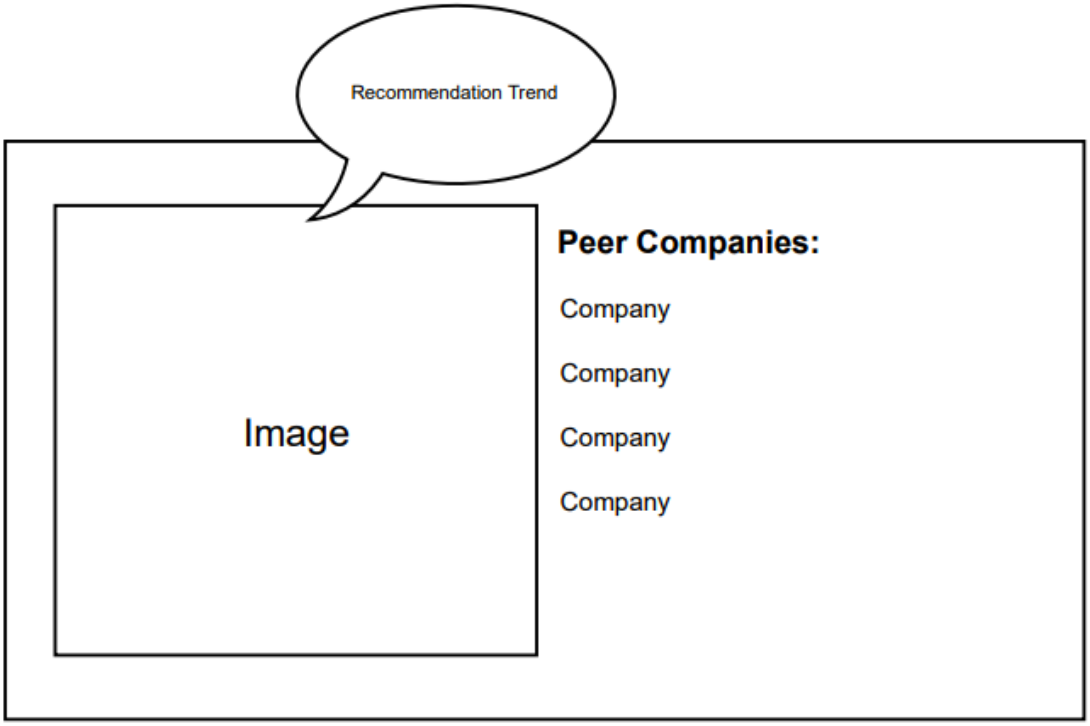


Figure 6 Statistics and Analysis Dropdown Display

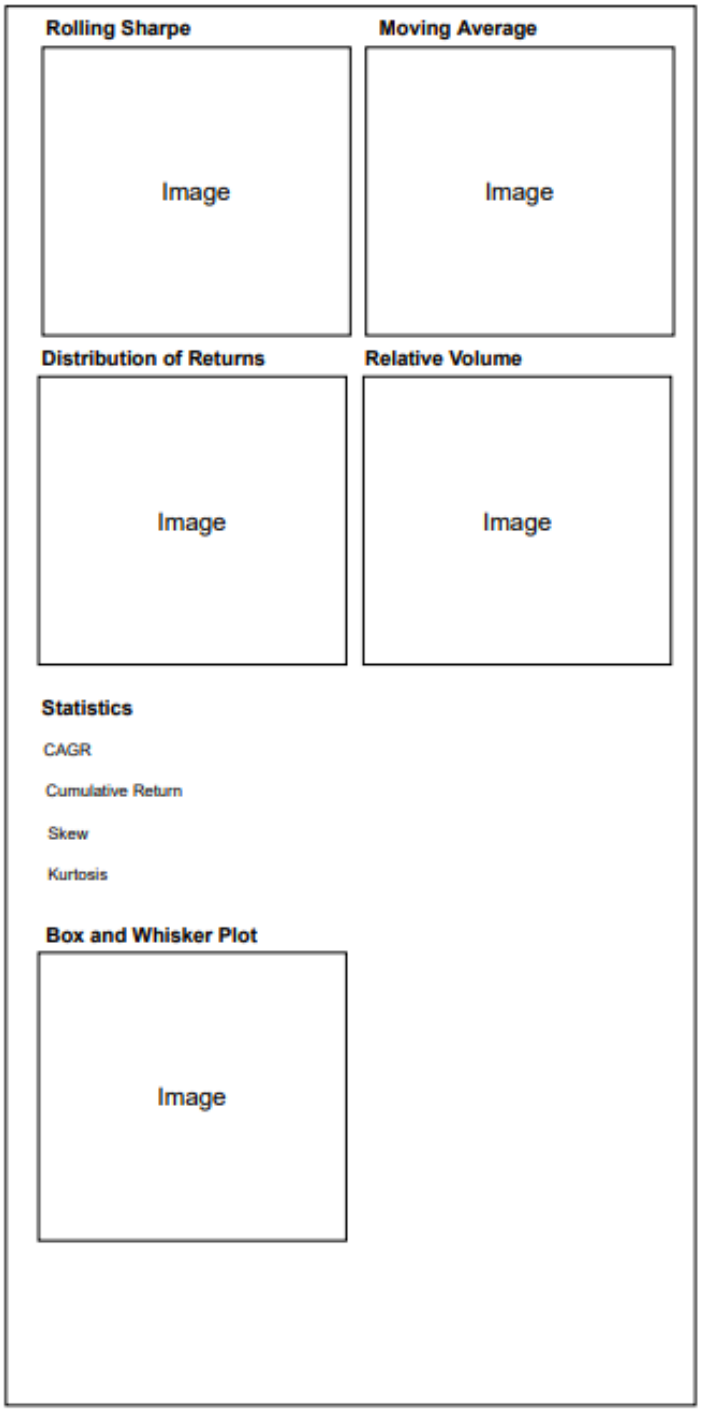


Figure 7 Linear Regression Model Dropdown Display

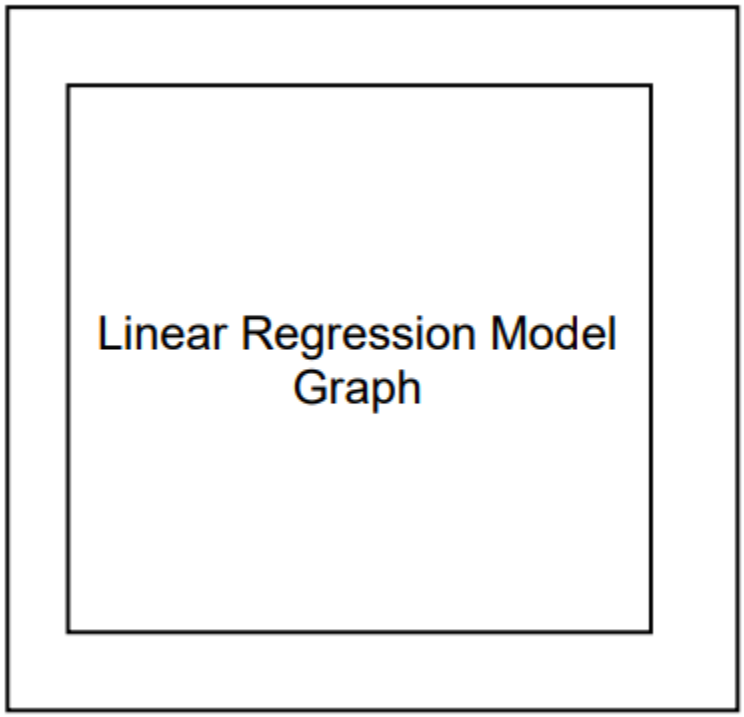
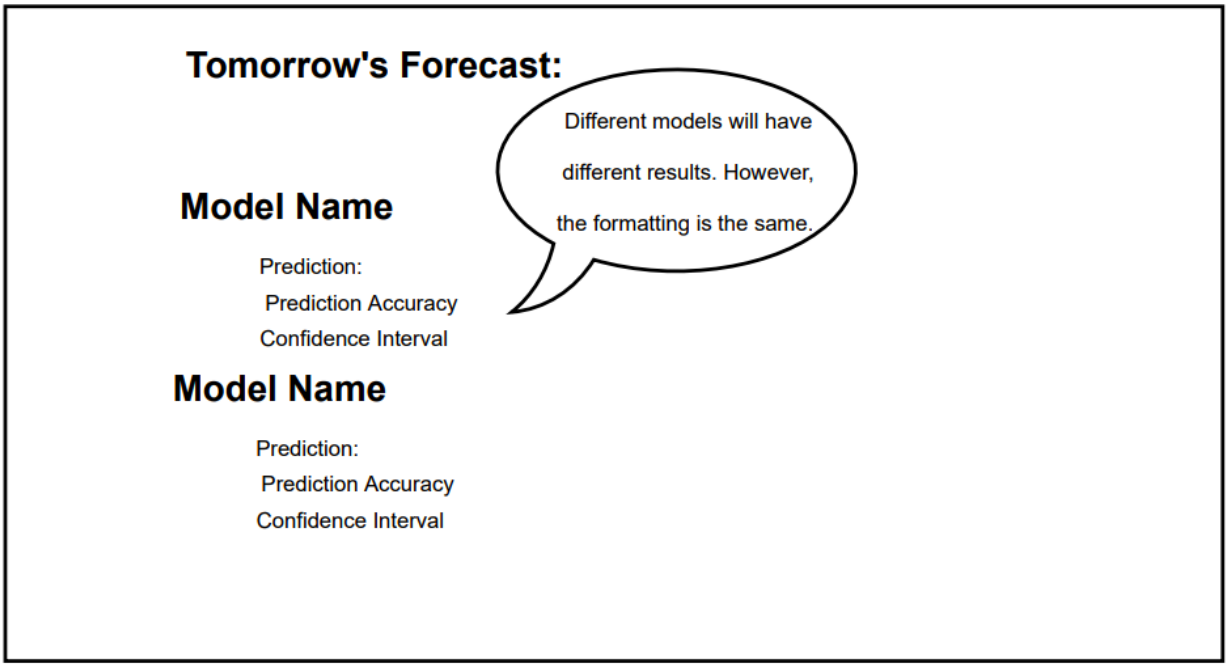
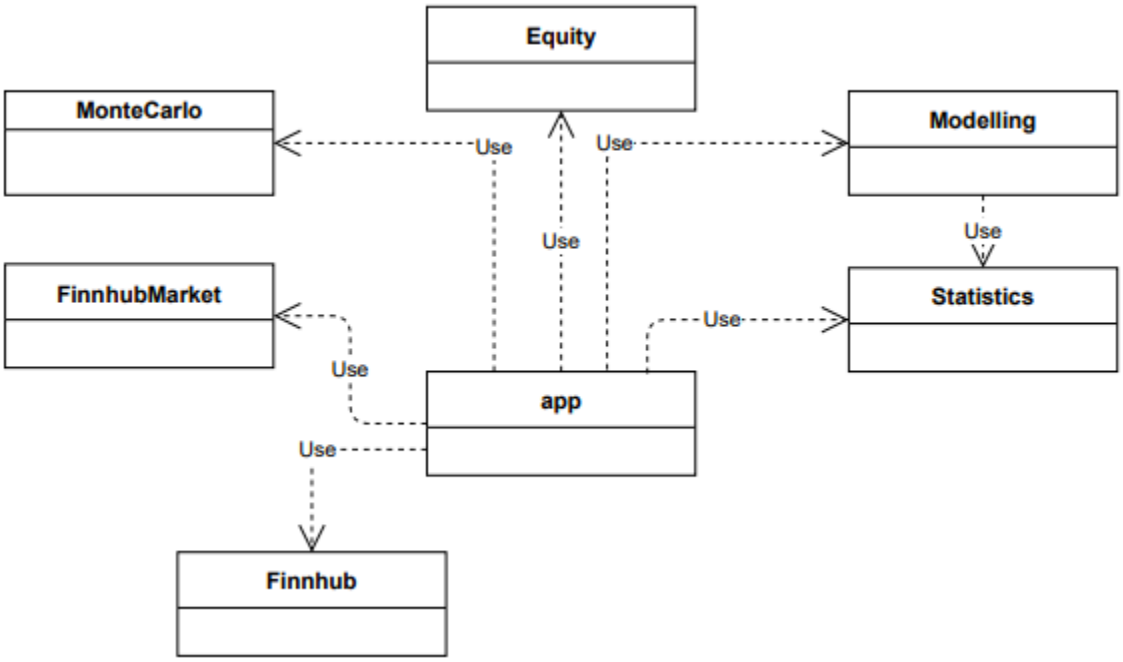


Figure 8 Classification Model Dropdown Display



Relationships between Classes/Files



Functionality of each class/file

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app.py - As python is capable of functional programming, this file does not contain a class. However, app.py creates all the different GUI sections of the project and instantiates every class to visualize information.

Equity - Equity has two main objectives: download time-series data for stock to ‘data.csv’ and check for invalid ticker inputs.

Modeling - Cleans data, trains machine learning models, creates features for machine learning models, returns a prediction for the machine learning models

Statistics - Calculates and plots statistical features of data from ‘data.csv’

Finnhub/FinnhubMarket - Obtains company news, peer recommendation, news sentiment, recommendation trends, and peer companies of a particular stock using Finnhub API.

MonteCarlo - Creates Monte Carlo simulation to calculate group probabilities of machine learning model accuracies.

Figure 9.1 Equity Class Overview

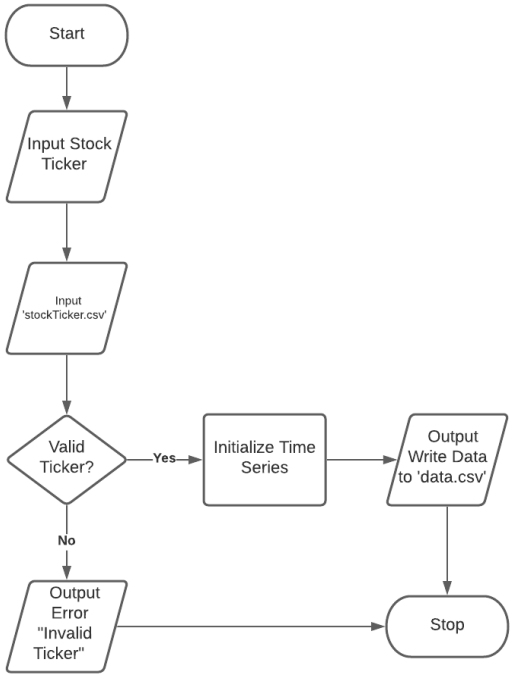


Figure 9.2 Initialize and Clean Time Series

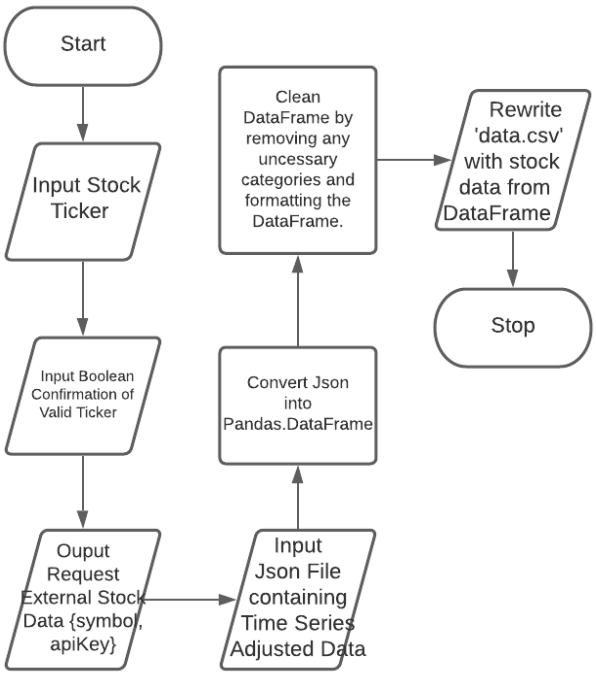


Figure 9.3 Ticker Searching Algorithm

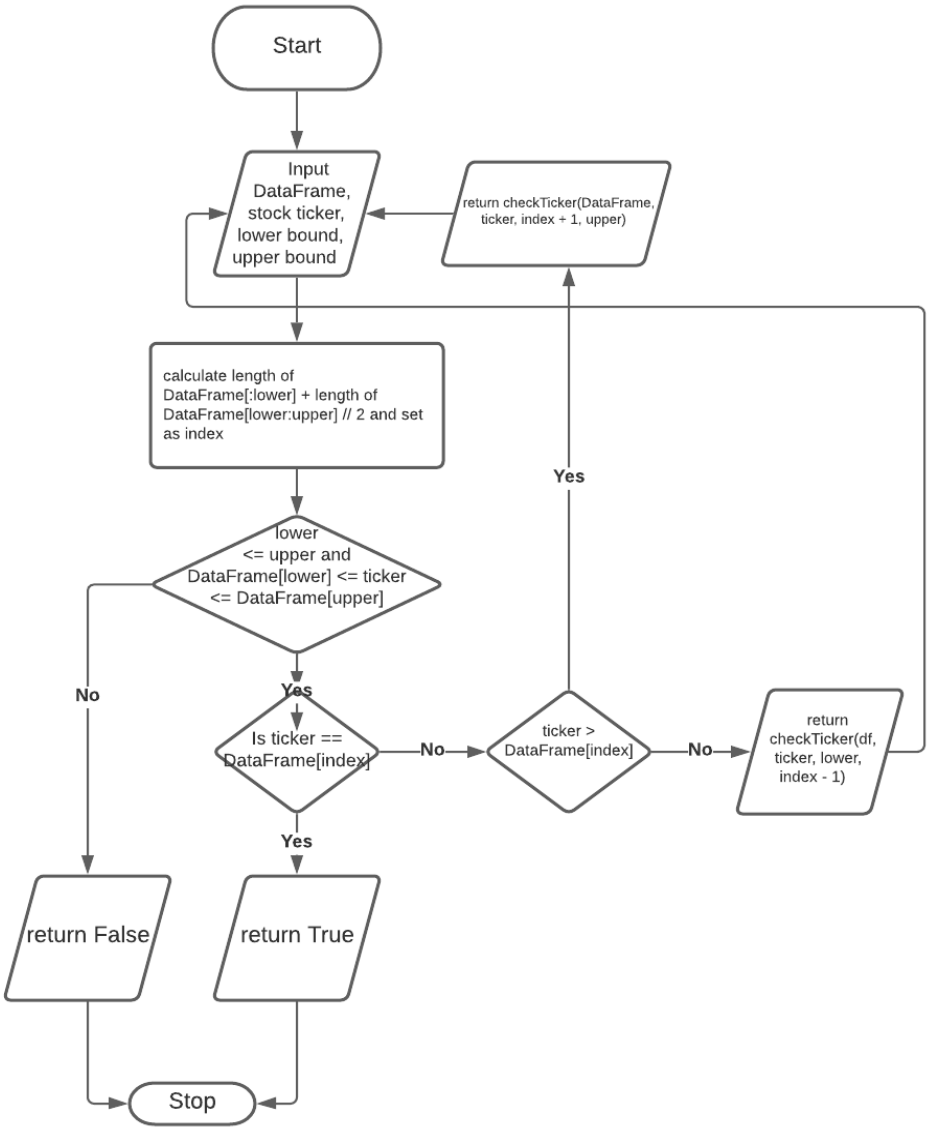


Figure 10 Monte Carlo Simulation

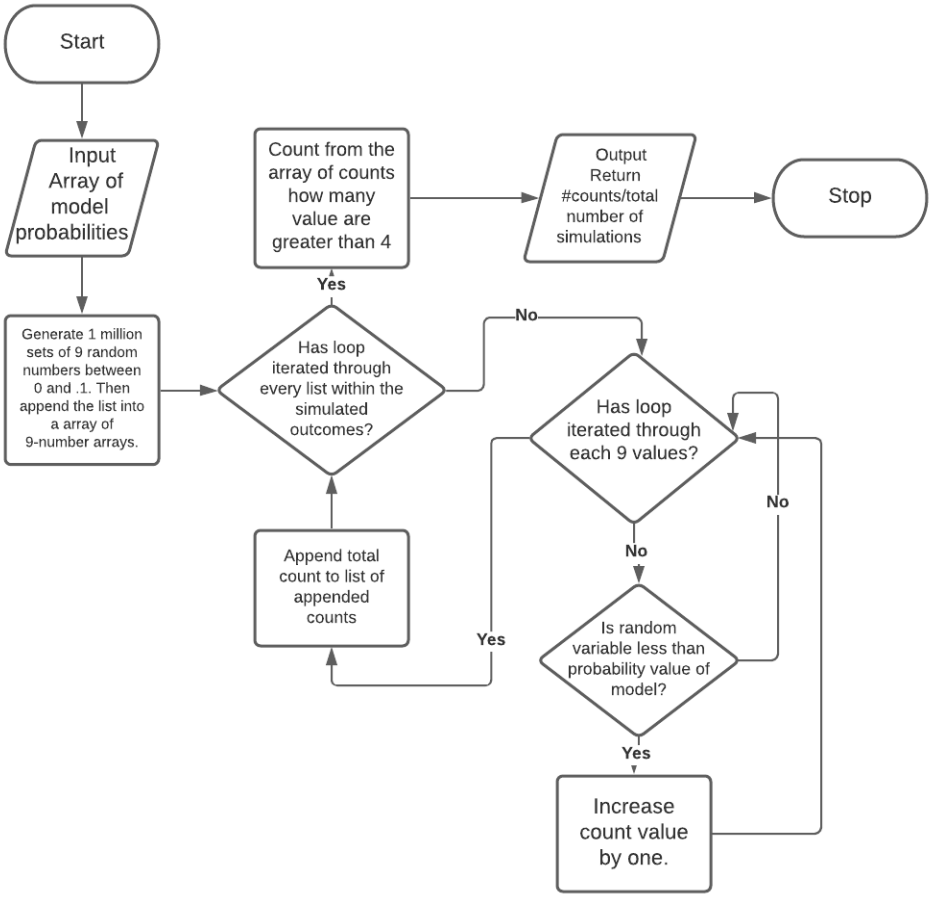


Figure 11.1 Finnhub Requests Algorithm

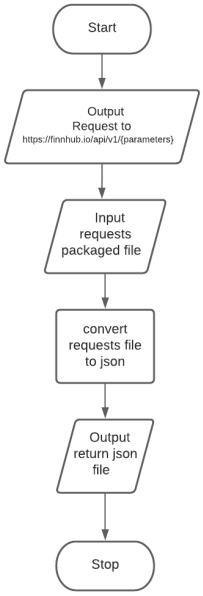
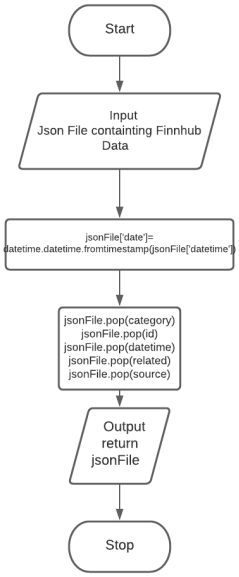
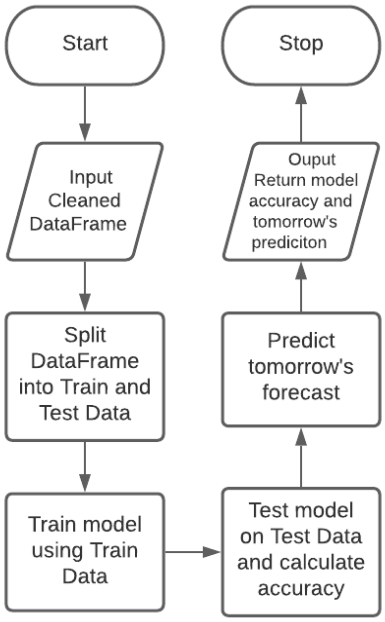


Figure 11.2 Finnhub Clean Data Method



Market data will come from Finnhub using a custom API generated for the user.

Figure 12.1 Modeling Machine Learning Template



While there are 9 different ML models, the process for training each model is the same.

Figure 12.2 Confidence Interval Method

Due to the statistical nature of machine learning forecasting, a confidence interval is necessary to provide an estimate for the true accuracy of the model.

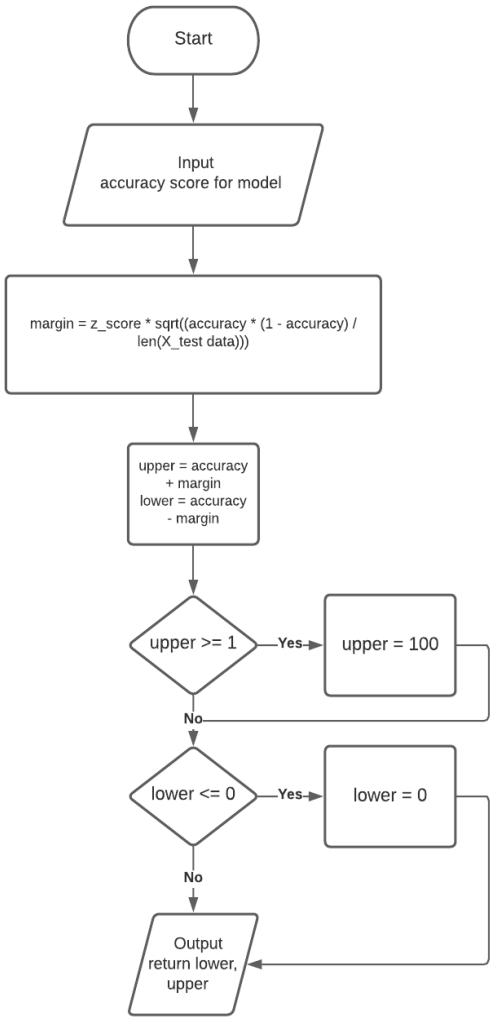
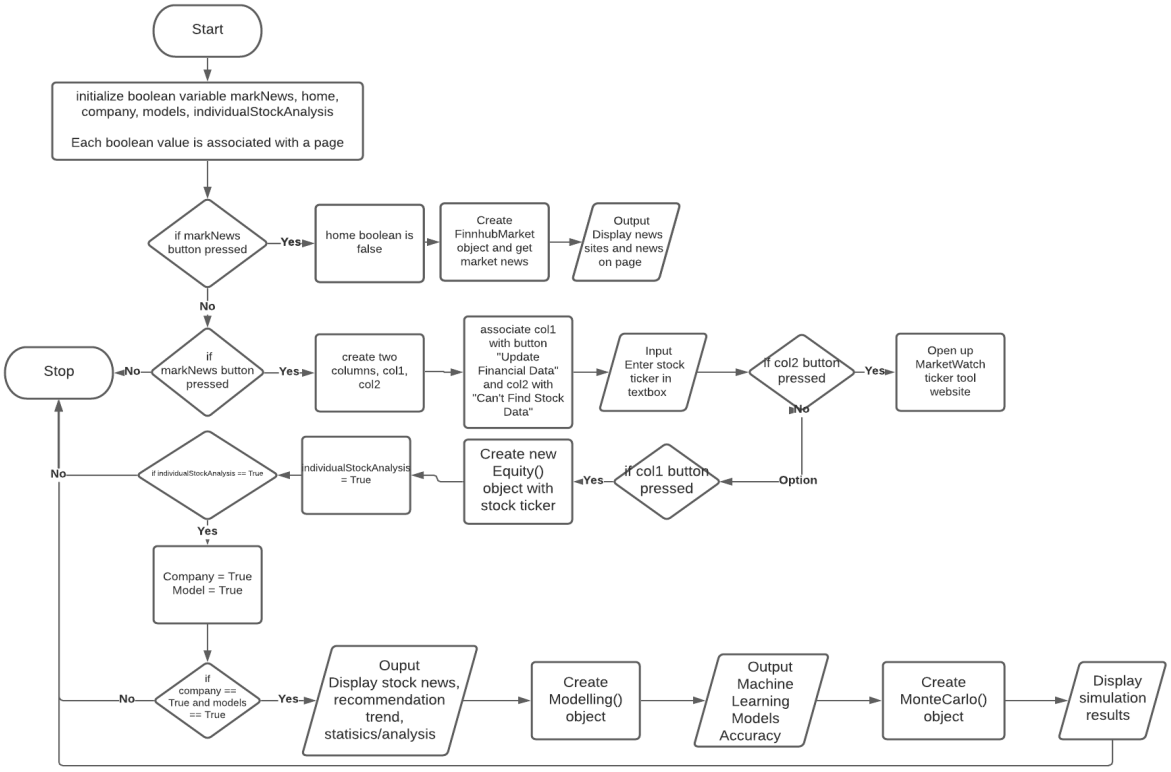


Figure 13 app.py Process



Test Plan

Test Type	Nature of Test
When putting an incorrect symbol, the program will identify and notify the user.	Check if the program can handle errors and notify the user.
Check that each button works correctly.	This will ensure that all aspects of the program are displayed and available for the user.
Ensure that all streamlit components work as intended	If any part of streamlight's functioning is problematic, the program will not fully display the information the client requires.
Ensure that all the machine learning models are trained and forecast data appropriately.	Once the “Classification Model” dropdown is selected, 9 different models and their predictions/accuracies should be listed or in the process of training. Furthermore if the models are still training there should be clear indication.
Market and equity news is properly scraped and cleaned for the user to view.	Check that news for stocks in different sectors and markets still display appropriately.
Check that the software is easy to use and operate.	Program consistent with the three-click rule for navigation.
Ensure that each component of the program when visualized is capable of dynamic data.	Test each component with stocks containing years of information vs. newly offered stocks.