CAB432 Assignment 1

Easy Money – Finance API Mashup

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1.0 Introduction

1.1 Mashup Description

Easy Money is an API mashup web application which helps a user research trending stocks quickly. The application combines financial market data with news and charting APIs to deliver the user experience beyond simply viewing prices. The mashup can find trending stocks and deliver it alongside relevant news, but also the reverse where news is parsed for company mentions. This allows research on trending companies to be done quickly as trending stocks, associated news, and charting are combined into an easy to use interface. The focus is on US share markets with some support for other major exchanges.

There are three use cases of the web page. First, trending stock lists (range of market factors available) can be found along with news explaining why. Second, headline news can be parsed for company mentions and their recent financial performance provided. Last, charting of a stock is available for visualising historic data if a company is worth viewing further. Figure 1 shows the web interface shown on initial load and further interactions are shown later.

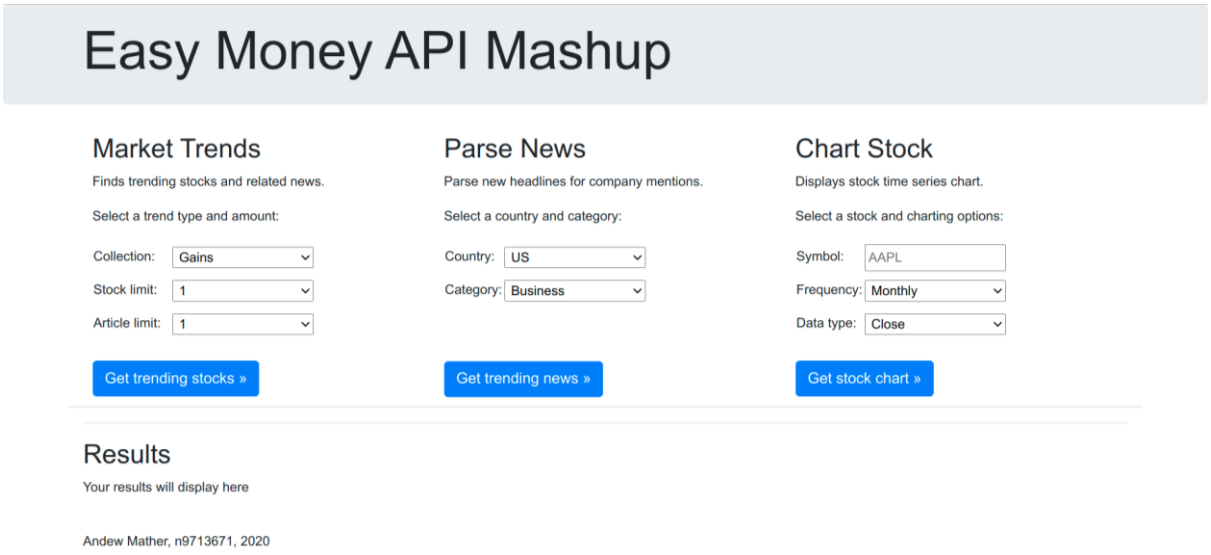


Figure 1 – Web application on initial load

1.2 API Services

Five online REST APIs are used in the application. Each is listed below with a link with a short description of services and the endpoints used.

Alpha Advantage

https://www.alphavantage.co/

Alpha Advantage provides four categories of financial data APIs. These are stock time series, fundamental data, physical and crypto currencies, and technical indicators. The API takes HTTPS REST requests and returns JSON responses. The application will use stock time series and fundamental data endpoints.

Endpoint – stock time series, time_series_adjusted
This endpoint returns time series (date, open, high, low, close, volume, adjusted close, and split/dividend events) of the global equity specified, covering 20+ years of historical data. Data intervals available are daily, weekly, and monthly.
Endpoint:
https://www.alphavantage.co/query?function=TIME_SERIES_{interval}_ADJUSTED
Docs: https://www.alphavantage.co/documentation/

Endpoint – fundamental data, company_overview
This API returns company information, a description, financial ratios, and other key metrics for the equity specified. Data is generally refreshed on the same day a company reports its latest earnings and financials.
https://www.alphavantage.co/query?function=OVERVIEW
Docs: https://www.alphavantage.co/documentation/

IEX Cloud
https://iexcloud.io/
IEX Cloud is a financial data platform which provides similar services to Alpha Advantage above. This API is included as it provides a specific endpoint required that Alpha Advantage does not. The API takes HTTPS REST requests and returns JSON responses. The application uses trending stock lists endpoint.

Endpoint – Market Info, List
Returns an array of quotes for the top 10 symbols in a specified list. A list limit less than 10 can be provided and several list types (collections) are available. These are top gains, top losses, most active, and the highest volume.
Endpoint: https://cloud.iexapis.com/stock/market/list/{list-type}
Docs: https://iexcloud.io/docs/api/#list

News API
https://newsapi.org/
News API is a HTTP REST API to search and retrieve articles from global news sources across the web. Two main endpoints provide searchable data, top headlines, and everything. The API takes HTTP REST requests and returns JSON responses. The application will use both endpoints to search for specific news or parse headlines.

Endpoint – Everything
Search through millions of articles from over 50,000 large and small news sources and blogs. This includes breaking news as well as lesser articles.
Endpoint: https://newsapi.org/v2/everything
Docs: https://newsapi.org/docs/endpoints/everything

Endpoint – Top headlines
This endpoint provides live top and breaking headlines for a country, specific category in a country, single source, or multiple sources.

Endpoint: https://newsapi.org/v2/top-headlines
Docs: https://newsapi.org/docs/endpoints/top-headlines

QuickChart
https://quickchart.io
QuickChart is an API for generating chart images, PDFs, or QR codes. QuickChart is open source and does not require an API key. The API takes HTTP REST requests and returns image file responses. The application uses the charting functionality to graph historic data.

Endpoint – Chart post
QuickChart works by taking Chart.js configurations and rendering them on the backend as an image. If your chart is large or complicated, you may prefer to send a POST request rather than a GET request. This avoids limitations on URL length.
Endpoint: https://quickchart.io/chart
Docs: https://quickchart.io/documentation/#post-endpoint

Yahoo Finance
Link: http://d.yimg.com/autoc.finance.yahoo.com
This API allows access to several Yahoo Finance services by providing a function callback in the query. The API does not require a key and returns a mixed string and JSON responses. The application uses this to convert parsed company names into stock symbols. This endpoint is deprecated, and no docs are available, however, it is still functional. Parameters required are company name, region, language (lang), and the callback function. The relevant callback function is YAHOO.Finance.SymbolSuggest.ssCallback.

1.3 Statement on Assignment Demo
I intend to demonstrate my application face-to-face.

2.0 Mashup Use Cases and Services

2.1 Market Trends Use Case

As an	Investor
I want	To discover trending stocks and research why quickly
So that	I can narrow searches for large changes and companies of interest

This use case allows a user to quickly find trending stock information on a selected market factor. The user can select the trend of interest and some data limits. The user controls provided for this are shown in Figure 2. The collection choices provided are top gains, losses, volume, and most active. This case mashes API results from IEX Cloud with the News API. First, the user-chosen collection is used in a request to IEX Cloud. The results are presented in a table of stock results shown in Figure 3. Now users can request news for these trending stocks (by market factor) which is returned in a new table shown in Figure 4. The table adds new rows until cleared, or new stock request submitted. The two stages were separated to reduce clutter from all news appearing at once and allow the user more control.

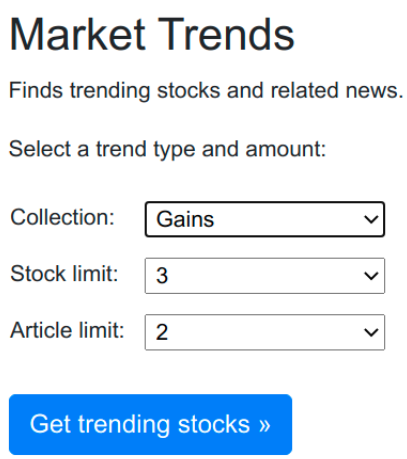


Figure 2 – Market trends user controls

Results

Symbol	Company	Exchange	Price	Change	Change %	Volume	Date	
NNOX	Nano-X Imaging Ltd.	NASDAQ	$64.19	$15.88	32.87%	9484191	September 11, 2020	Get news »
AMRK	A-Mark Precious Metals, Inc.	NASDAQ	$33.15	$7.09	27.21%	391788	September 11, 2020	Get news »
CKPT	Checkpoint Therapeutics, Inc.	NASDAQ	$3.32	$0.52	18.57%	13513513	September 11, 2020	Get news »

Figure 3 – Trending stocks result's table

Trending News

Clear news »

Company	Cover	Article	Source	Date
Checkpoint Therapeutics, Inc.		CMAB Biopharma and Laekna Therapeutics Enter Strategic Agreement for LAE005 Global Development and Commercialization Partnership CMAB Biopharma (Suzhou) Inc. ("CMAB"), and Laekna Therapeutics Shanghai Co., Ltd. ("Laekna Therapeutics"), today announced a strategic collaboration agreement in Suzhou BioBAY for speedup of Immune Checkpoint Inhibitor (ICI) drug candidate to the clinical tri…	Yahoo Entertainment	2020-09-10
Checkpoint Therapeutics, Inc.	MIRATI THERAPEUTICS	Mirati Therapeutics To Participate In Citi's 15th Annual Biopharma Virtual Conference Mirati Therapeutics, Inc. (NASDAQ: MRTX), a clinical-stage targeted oncology company, today announced it will participate in a fireside chat at the Citi 15th Annual Biopharma Virtual Conference on Thursday, September 10, 2020 at 11:40 a.m. ET/8:40 a.m. PT. Da…	Yahoo Entertainment	2020-09-03

Figure 4 – Trending stock news result's table

2.2 Parse News Use Case

As an	Investor
I want	To discover companies trending in the news
So that	I can quickly see financial their performance and potential as a stock

This use case allows a user to parse headline news to find trending company mentions and related stock financial information. The user can select a country and category of interest and the application handles the rest until display. The user controls provided for this are shown in Figure 5. Nine major countries are available to choose, and six news categories. The best results are obtained on US business news. This case mashes API results from the News API with Yahoo Finance and then Alpha Advantage. First, the user choices are provided in the News API request to retrieve the relevant top headlines. The server parses this for likely company names and these are converted to stock symbols with the Yahoo Finance API. The company symbols are then used in requests to Alpha Advantage for company overview and key fundamental data when a user selects the stock in the list. Application results are presented in a table listing stocks against each article shown in Figure 6. Tables contain hyperlinks to the news source but also links on company symbols to open a modal of stock information, shown in Figure 7.

Parse News

Parse new headlines for company mentions.

Select a country and category:

Country: US

Category: Business

Get trending news »

Figure 5 – Parse news user controls

Trending News

Company	Cover	Article	Source	Date
TSLA		Tesla Model 3 poised for power liftgate, center console upgrade, new 'frunk,' and more - Teslarati Recent reports from China are suggesting that Tesla may be poised to roll out some notable improvements to the Gigafactory Shanghai-made Model 3. If the speculations prove accurate, Tesla's most affordable sedan will soon be getting a powered lift gate and tr…	Teslarati	2020-09-13T03:51:42Z
TSLA TSLA		Elon Musk Explains Why Tesla Solar Power Is So Cheap — CleanTechnica Exclusive - CleanTechnica After discovering just how much cheaper Tesla solar power was compared to the US average and state averages, I was curious to learn more. So I asked Tesla CEO Elon Musk about it	CleanTechnica	2020-09-13T02:57:28Z
AZN		Coronavirus vaccine trial at Oxford to resume despite side effect scare - OregonLive The vaccine being developed by Oxford and AstraZeneca is widely perceived to be one of the strongest contenders among the dozens of coronavirus vaccines in various stages of testing around the world.	OregonLive	2020-09-13T00:04:00Z

Figure 6 – News parsing result's table

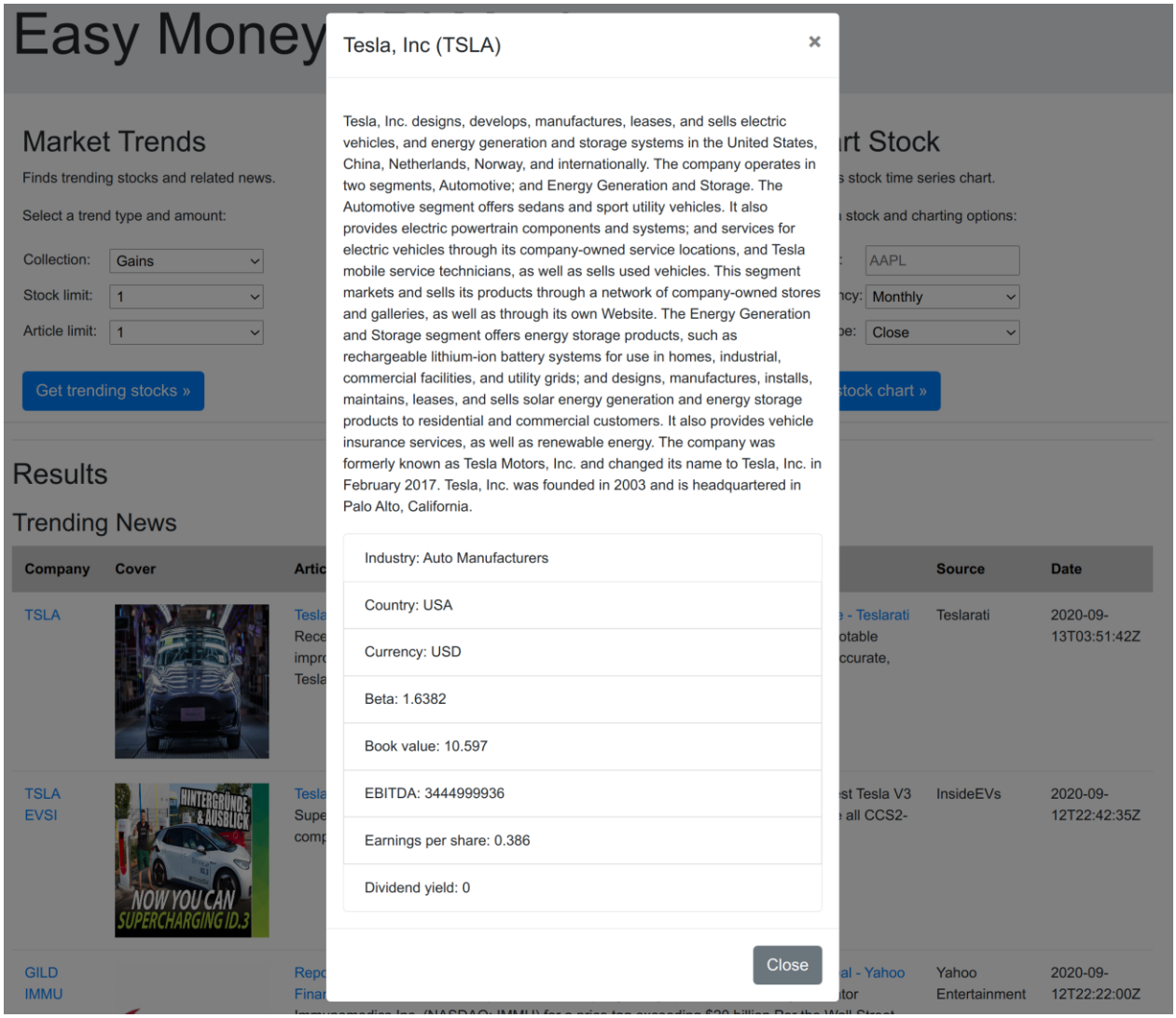


Figure 7 – Modal containing stock overview

2.3 Stock Charting Use Case

As an	Investor
I want	To check on the historic performance of stock factors
So that	Get additional information for decisions while viewing the trend and news information of the previous use cases.

This use case allows a user to stock historic chart information quickly after seeing companies of interest from the previous use cases. The user can select a stock symbol, a data interval (frequency) and the type of data desired. Data types are price close, open, high, low, and volume. The user control view can be seen in Figure 8. This case mashes API results from Alpha Advantage with QuickChart. First user choices are used in the Alpha Advantage API request to retrieve historic stock data. The server constructs the chart data from this which can be quite long. Thus secondly, a post request to QuickChart's API is sent and the chart image retrieved, saved in the server's public files and displayed to the user. An example output can be seen in Figure 9. Note the stock symbol link opens the additional detail modal (using an Alpha Advantage API request) discussed in the previous use case.

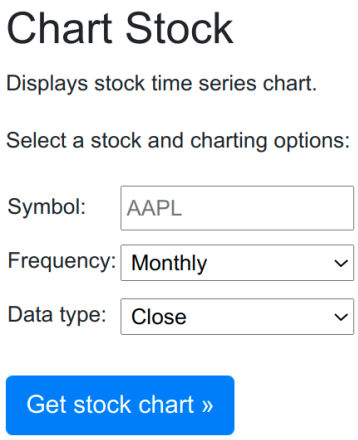


Figure 8 – Chart stock user controls

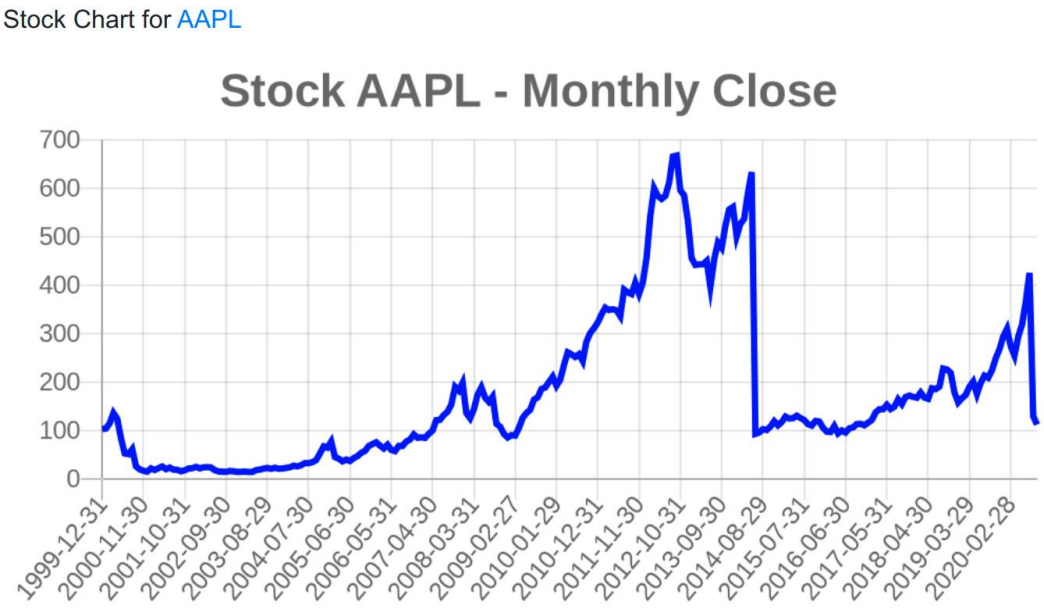


Figure 9 – Stock charting results example

3.0 Technical breakdown

3.1 Architecture and Data Flow

This is a web application with responsibilities split between server and client-side. The Node.js server handles all requests and responses to APIs and performs any data manipulation required. The client-side handles user input, sends requests to the server, and displays returned data. The server is accessed via port 3000 on localhost, and the docker container mapped to port 80 when deployed. The main server technologies are Node.js (12.18.3), routing with Express (4.16.4), and requests with Axios (0.20.0). The main client-side technologies are Bootstrap (4.5.2) for display and styling and Knockout (3.5.1) for a view model and data bindings.

Source code layout

The application source code is organised in a standard layout as shown in the left-most list in Figure 11. The client-side contained within the “public” folder is shown in the middle list, and the “routes” contents are shown in the right-most list.

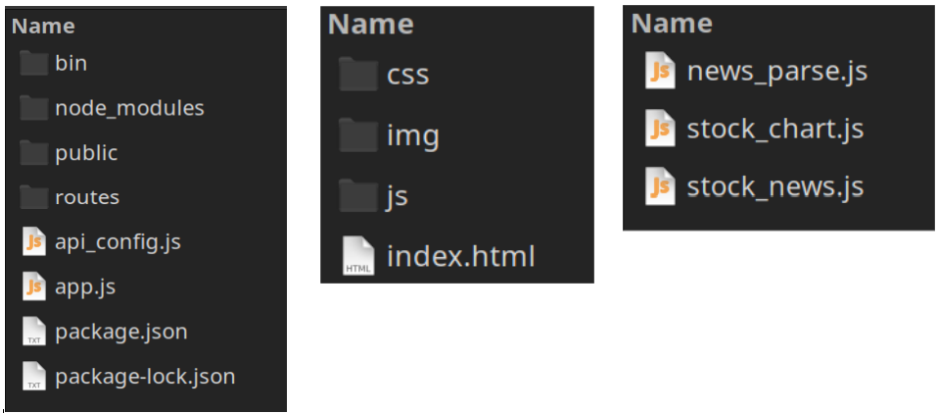


Figure 10 - Source code layout

There are several files at the root of the application. The file “app.js” sets up the Express application, and the three server routers used, previously listed. The “api_config.js” file contains API links and keys the routers consult to send correct API requests. The package and package-lock JSON files contain project dependencies and set “npm start” to run “node ./bin/www” to start the server. The “bin” folder contains the “www” file which starts a HTTP server on port 3000 and handles server connections. While the “node modules” folder contains installed NPM packages.

The “public” folder contains the client-side source code, with the single page index HTML file and supporting assets. The “css” folder contains Bootstrap CSS and a custom stylesheet. The “img” folder contains the application favicon and a chart image when generated. The “js” folder contains JavaScripts for Bootstrap, JQuery, Knockout, and a custom script file which implements the web page view model.

The “routes” folder contains the express application routers which handle most of the server processing and client requests. These are set up in “app.js” and will be further discussed in the server-side discussion below.

Server-side

The server initially sets up four application routes, the index at "/" and three routers are set up at the routes shown below. The flowchart in Figure 10 describes the server process when a user request is made and links it to the use cases and their API calls discussed in the previous section.

```
// Setup application routes
app.use("/api/stock", apiMarketTrends);
app.use("/api/parse", apiNewsParse);
app.use("/api/chart", apiStockChart);
```

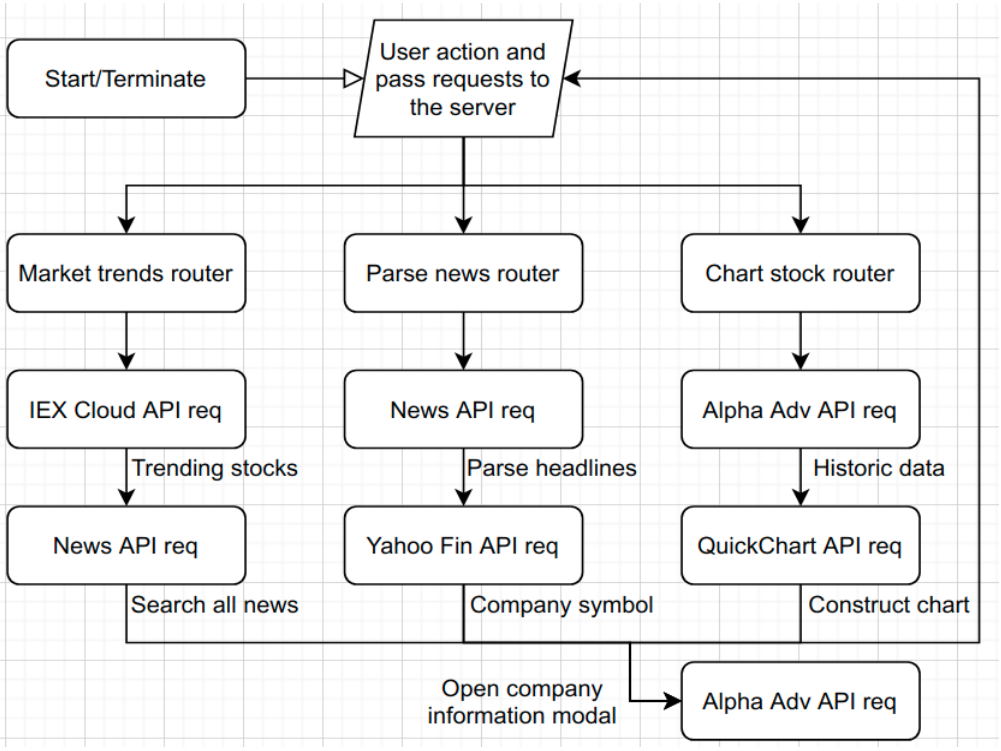


Figure 11 – Server-side flowchart

A partial code example of the market trends router handling a client request to search for news about a stock is provided in Figure 12. This shows the route called with user parameters. The News API request URL is constructed, then called using Axios, and further data processing takes places afterwards before returning JSON data to the client.

```
// Route for use case finding trending stocks and associated news, news component
router.get("/news/:search/:articleLimit", (req, res) => {
    // Handle parameters and construct url for desired news search
    const search = req.params.search;
    const url = `${api.newsApi.hostname}${api.newsApi.path_search}?q=${search}&apiKey=${api.newsApi.key}`;

    // Call News API for searched news
    axios.get(url).then(response => {
        // Receive data and take desired properties
        const data = response.data;
```

Figure 12 – Example server handling a client request

Client-side

The client-side is designed as a single page application and built with the package Knockout. Knockout allows declarative bindings to DOM elements, automatic UI refresh, dependency tracking, and templating. A class is constructed (in JavaScript) which can contain Knockout observable variables such as those below. Any update to these observable variables will automatically update on the UI.

```
self.showParsed = ko.observable(false);
self.parsedList = ko.observableArray([]);
```

These observables, along with functions and standard JavaScript are contained within a class called a view model. Knockout can bind this view model to a HTML page that has included the JavaScript file.

```
// Create view model and apply bindings
$(function() {
    "use strict";
    ko.applyBindings(new ViewModel());
});
```

This HTML page now has access to the variables and functions within the view model. An example of the parse news results implementation is shown below. The first highlighted text shows where Knockout can implement conditionals on whether to display one or many elements. The second highlighted text shows how variables can be looped to easily generate dynamic tables or other features. Within this table, elements can have their click actions bound to functions or contents bound to properties of the observable array elements.

```
<!-- Parse news use case results -->
<!-- ko if: showParsed -->
    <h4>Trending News</h4>

    <table class="table">
        <thead>
            <tr class="row-title">
                <td>Company</td>
                <td>Cover</td>
                <td>Article</td>
                <td>Source</td>
                <td>Date</td>
            </tr>
        </thead>
        <tbody data-bind="foreach: parsedList">
            <tr>
                <td>
                    <!-- ko foreach: symbolMatches -->
                        <a data-bind="text: symbol, click: $parents[1].getStockInfo" href="#" data-toggle="modal" da
                        <br/>
                    <!-- /ko -->
                </td>
                <td><img class="articleImg" data-bind="attr: { src: urlToImage, alt: 'Article cover image' }"></td>
                <td>
                    <a data-bind="text: title, attr: { href: url}" target="_blank"></a>
                    <span data-bind="text: description"></span>
                </td>
                <td data-bind="text: source"></td>
                <td data-bind="text: publishedAt"></td>
            </tr>
        </tbody>      You, 3 days ago • Client side use case 2, currency moved
    </table>
<!-- /ko -->
```

3.2 Deployment and the Use of Docker

Docker was used to generate a container image and store it on Dockerhub. This allows easy retrieval by cloud instances to run the application. The image was generated using a Dockerfile shown in Appendix A. Key aspects are build the image on Ubuntu 18.04, install NodeJS 12.x, add source code, install NPM packages, and use the Dockerfile "CMD npm start" to start the server when the image is run.

3.3 Test plan

Table 1 displays the test plan for the application to validate functionality. All tests pass and evidence denotes the screenshot number in Appendix B to refer to.

Table 1: Test plan

Task	Expected	Result	Evidence
Request market trends with gains, stock limit 1, and article limit 1.	A table should display with one row displaying the stock symbol, company, exchange, price, change, volume, date, and a news button.	Pass	01
Open company information modal by clicking the company name hyperlink in the table from the prev test.	A popup modal should appear as the foreground, and the main content becomes the background. The modal should contain company description and stats, or display not found if such occurs.	Pass	02
Request get news for the displayed stock from the first test.	A second table should display with one-row displaying company, article photo, article title and description, source, and the date.	Pass	03
Select clear news after prev test.	The trending news table should be removed by the UI.	Pass	04
Repeat the prev four tests with active, stock limit 3, and article limit 3.	Results should be as before but with the corresponding number of table rows as the user option selections.	Pass	05
Request parse news with country US and category business.	After some time, a table should display with several rows of articles and stock symbols.	Pass	06
Open company information modal by clicking the company stock hyperlink in the table from the prev test.	A popup modal should appear as the foreground, and the main content becomes the background. The modal should contain company description and stats, or display not found if such occurs.	Pass	07
Also, click the article hyperlink	A new tab should open with the sourced article	Pass	nil

Request chart stock with symbol GOOG, monthly, and close data.	The chart should appear with Google historic close price history at monthly intervals.	Pass	08
Open company information modal by clicking the company stock hyperlink in the table from the prev test.	A popup modal should appear as the foreground, and the main content becomes the background. The modal should contain company description and stats, or display not found if such occurs.	Pass	09
Provide an invalid symbol format that is not only letters.	Results should display “Error occurred, please check your inputs”.	Pass	10
Provide a non-existent symbol that is still valid entry.	Results should display “Error occurred, please check your inputs”.	Pass	11
Run client after network loss	All requests should display an appropriate error.	Pass	12
Decrease browser width to the minimum allowed.	UI should handle the changing size and rearrange itself appropriately.	Pass	13

3.4 Difficulties and Issues

No notable difficulties were encountered during the application’s development. All planned functionality has been completed and no known bugs exist.

4.0 User guide

On launch, a user is presented with the following Figure 13 screen with three distinct areas for the three use cases. This guide will cover these from left to right.

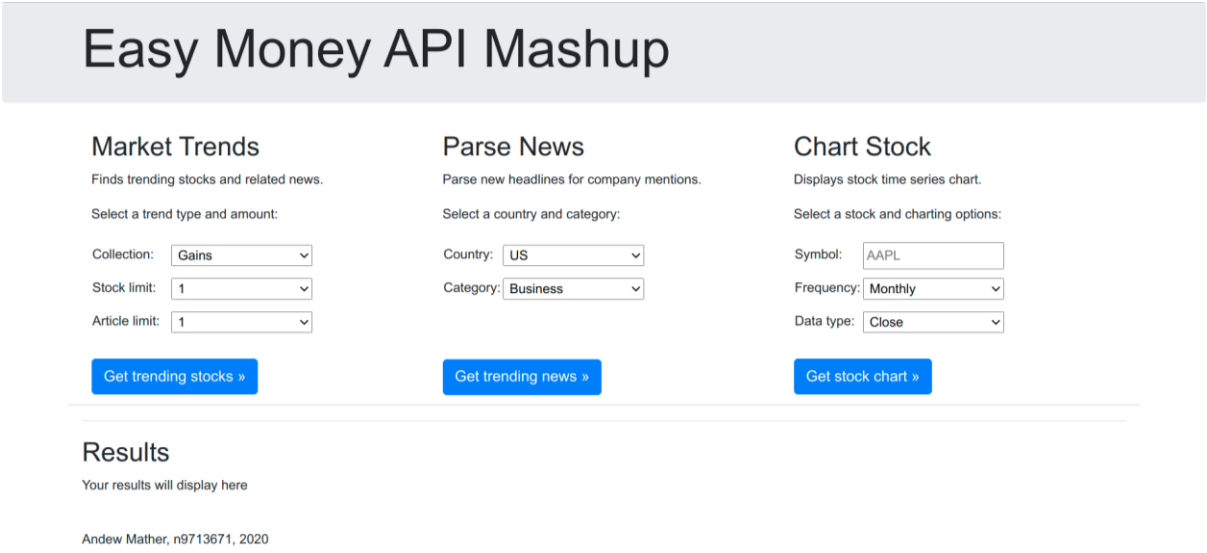


Figure 13 – Application on launch

Market trends usage

Select a stock trend type (collection) from the list, a stock limit (up to 5) and a limit of articles per stock (up to 5). Once satisfied with your selection select the get trending stocks button below the options. Your data will now display in the results section. Figure 14 shows the first results table with selections, gains, three stocks, and two article limits.

Symbol	Company	Exchange	Price	Change	Change %	Volume	Date	
NNOX	Nano-X Imaging Ltd.	NASDAQ	$64.19	$15.88	32.87%	9484191	September 11, 2020	Get news »
AMRK	A-Mark Precious Metals, Inc.	NASDAQ	$33.15	$7.09	27.21%	391788	September 11, 2020	Get news »
CKPT	Checkpoint Therapeutics, Inc.	NASDAQ	$3.32	$0.52	18.57%	13513513	September 11, 2020	Get news »

Figure 14 - Market trends results – stocks

You can now click the company name link to view company descriptions and key financial information in a popup modal. Or you can select the get news buttons in the right-most column of each stock. This will display a second table below the current one with the results of a news search on the company. Click the clear news button to remove this table at any point. See Figure 15 for an example of selecting get news for Checkpoint Therapeutics Inc.

Trending News

Clear news »

Company	Cover	Article	Source	Date
Checkpoint Therapeutics, Inc.		CMAB Biopharma and Laekna Therapeutics Enter Strategic Agreement for LAE005 Global Development and Commercialization Partnership CMAB Biopharma (Suzhou) Inc. ("CMAB"), and Laekna Therapeutics Shanghai Co., Ltd. ("Laekna Therapeutics"), today announced a strategic collaboration agreement in Suzhou BioBAY for speedup of Immune Checkpoint Inhibitor (ICI) drug candidate to the clinical tri…	Yahoo Entertainment	2020-09-10
Checkpoint Therapeutics, Inc.	MIRATI THERAPEUTICS	Mirati Therapeutics To Participate In Citi's 15th Annual Biopharma Virtual Conference Mirati Therapeutics, Inc. (NASDAQ: MRTX), a clinical-stage targeted oncology company, today announced it will participate in a fireside chat at the Citi 15th Annual Biopharma Virtual Conference on Thursday, September 10, 2020 at 11:40 a.m. ET/8:40 a.m. PT. Da…	Yahoo Entertainment	2020-09-03

Figure 15 - Market trends results – news

Parse news usage

Select a country and category of news you are interested in. US and business are the most effective options. Once satisfied with your options, select the get trending news button. Your data will now display in the results section. This request can take much longer than the other use cases. You should now see results resembling Figure 16.

Trending News

Company	Cover	Article	Source	Date
TSLA		Tesla Model 3 poised for power liftgate, center console upgrade, new 'frunk,' and more - Teslarati Recent reports from China are suggesting that Tesla may be poised to roll out some notable improvements to the Gigafactory Shanghai-made Model 3. If the speculations prove accurate, Tesla's most affordable sedan will soon be getting a powered lift gate and tr…	Teslarati	2020-09-13T03:51:42Z
TSLA TSLA		Elon Musk Explains Why Tesla Solar Power Is So Cheap — CleanTechnica Exclusive - CleanTechnica After discovering just how much cheaper Tesla solar power was compared to the US average and state averages, I was curious to learn more. So I asked Tesla CEO Elon Musk about it	CleanTechnica	2020-09-13T02:57:28Z
AZN		Coronavirus vaccine trial at Oxford to resume despite side effect scare - OregonLive The vaccine being developed by Oxford and AstraZeneca is widely perceived to be one of the strongest contenders among the dozens of coronavirus vaccines in various stages of testing around the world.	OregonLive	2020-09-13T00:04:00Z

Figure 16 - Parse news results

Chart stock usage

Input a stock symbol, select a data interval (frequency) and data type from the lists. Invalid symbol formats will be rejected, or those returning no data displaying a similar error. Once satisfied with your selection select the get stock data button. Your charted data will now display in the results section, such as in Figure 17.

Stock Chart for AAPL

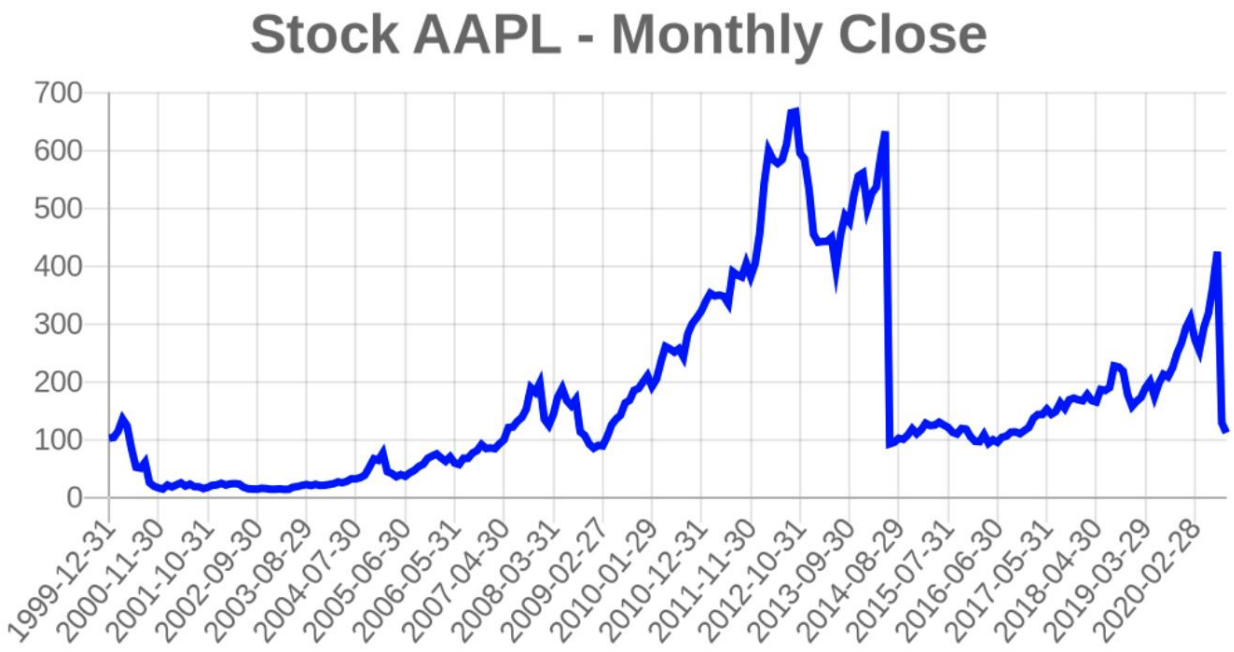


Figure 17 - Chart stock results

5.0 Appendix A – Dockerfile

```
# Set base image to Ubuntu
FROM ubuntu:18.04
MAINTAINER Andrew Mather

# Install basic applications
RUN apt-get update
RUN apt-get -y install curl gnupg
RUN curl -sL https://deb.nodesource.com/setup_12.x | bash -
RUN apt-get -y install nodejs

# Copy the application folder inside the container
ADD /easymoney /easymoney

# Expose port
EXPOSE 3000

# Set default CMD directory
WORKDIR /easymoney

# Setup web server
RUN npm install

# Start web server when container run
CMD npm start
```

5.0 Appendix B – Test Results

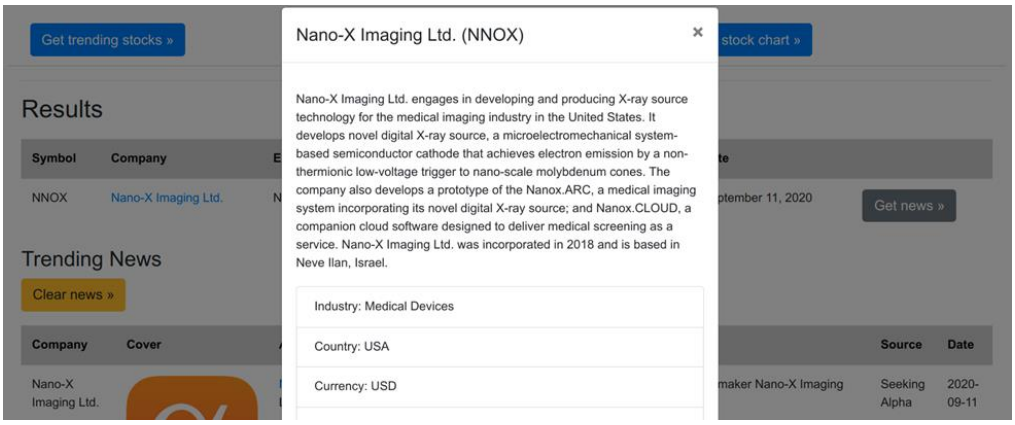
01)

Results

Symbol	Company	Exchange	Price	Change	Change %	Volume	Date	
NNOX	Nano-X Imaging Ltd.	NASDAQ	$64.19	$15.88	32.87%	9484191	September 11, 2020	Get news »

Andew Mather, n9713671, 2020

02)



03)

Results

Symbol	Company	Exchange	Price	Change	Change %	Volume	Date	
NNOX	Nano-X Imaging Ltd.	NASDAQ	$64.19	$15.88	32.87%	9484191	September 11, 2020	Get news »

Trending News

Clear news »

Company	Cover	Article	Source	Date
Nano-X Imaging Ltd.		Nano-X adds to blistering post-IPO pace, up 20% Israeli affordable imaging gear maker Nano-X Imaging Ltd. (NNOX +20.1%) has been a top gainer since its U.S.	Seeking Alpha	2020-09-11

04)

Results

Symbol	Company	Exchange	Price	Change	Change %	Volume	Date	
NNOX	Nano-X Imaging Ltd.	NASDAQ	$64.19	$15.88	32.87%	9484191	September 11, 2020	Get news »

Andew Mather, n9713671, 2020

05)

Results

Symbol	Company	Exchange	Price	Change	Change %	Volume	Date	
AAPL	Apple, Inc.	NASDAQ	$112	$-1.49	-1.31%	180860325	September 11, 2020	Get news »
NKLA	Nikola Corp.	NASDAQ	$32.13	$-5.44	-14.48%	99981446	September 11, 2020	Get news »
PTON	Peloton Interactive, Inc.	NASDAQ	$84.04	$-3.71	-4.23%	87398128	September 11, 2020	Get news »

Trending News

Clear news »

Company	Cover	Article	Source	Date
Apple, Inc.		Apple Flinched Facebook initiated one of the pettiest corporate feuds against Apple's supposedly privacy-centric new features, and today Apple capitulated. Read more...	Gizmodo.com	2020-09-03
Apple, Inc.		Italy antitrust opens inquiry into Google, Apple, Dropbox on cloud computing - Reuters Canada Italy's antitrust authority said on Monday it had opened an inquiry into Google Inc, Apple Inc and Dropbox Inc over cloud computing services.	Reuters	2020-09-07
Apple, Inc.		Italy antitrust opens inquiry into Google, Apple, Dropbox on cloud computing - Reuters Italy's antitrust authority said on Monday it had opened an inquiry into Google Inc, Apple Inc and Dropbox Inc over cloud computing services.	Reuters	2020-09-07

06)

Results

Trending News

Company	Cover	Article	Source	Date
TSLA		Huge Tesla Autopilot Update Coming In 6–10 Weeks (To Early Access Owners) - CleanTechnica One of the biggest updates in the history of Tesla Autopilot is supposed to be coming in 6–10 weeks to "Early Access" Tesla owners — these are owners who by hook or by crook got into a public beta testing group for Tesla firmware updates	CleanTechnica	2020-09-13T04:43:18Z
TSLA		Tesla Model 3 poised for power liftgate, center console upgrade, new 'frunk,' and more - Teslarati Recent reports from China are suggesting that Tesla may be poised to roll out some notable improvements to the Gigafactory Shanghai-made Model 3. If the speculations prove accurate, Tesla's most affordable sedan will soon be getting a powered lift gate and tr…	Teslarati	2020-09-13T03:51:42Z
AZN		Coronavirus vaccine trial at Oxford to resume despite side effect scare - OregonLive The vaccine being developed by Oxford and AstraZeneca is widely perceived to be one of the strongest contenders among the dozens of coronavirus vaccines in various stages of testing around the world.	OregonLive	2020-09-13T00:04:00Z

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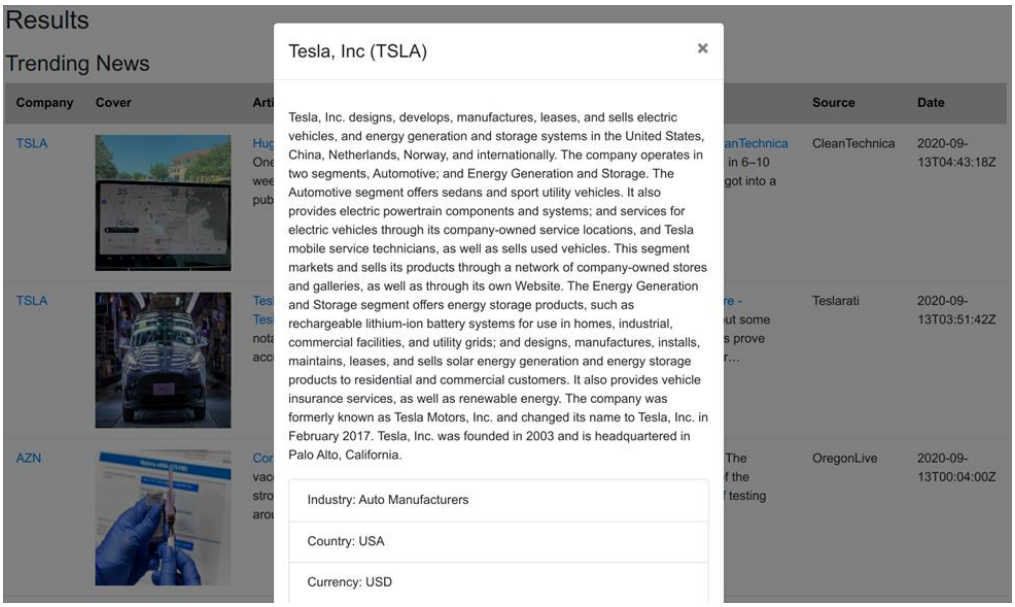
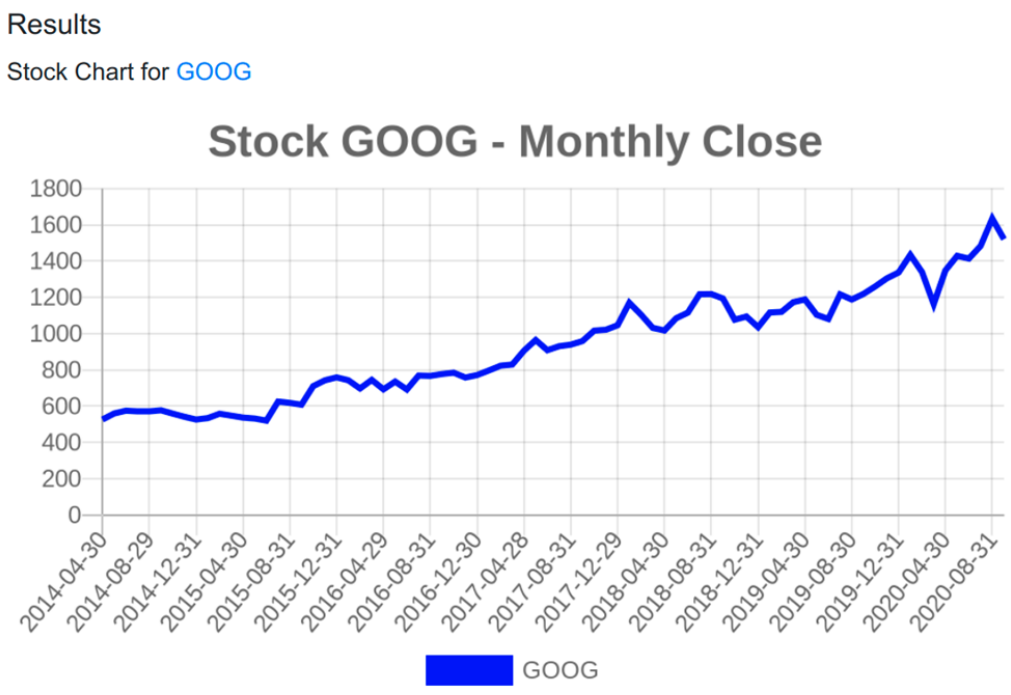

Results
Trending News
Company
Cover
Source
Date
TSLA
CleanTechnica
2020-09-13T04:43:18Z
TSLA
Teslarati
2020-09-13T03:51:42Z
AZN
OregonLive
2020-09-13T00:04:00Z
Tesla, Inc (TSLA)
Tesla, Inc. designs, develops, manufactures, leases, and sells electric vehicles, and energy generation and storage systems in the United States, China, Netherlands, Norway, and internationally. The company operates in two segments, Automotive; and Energy Generation and Storage. The Automotive segment offers sedans and sport utility vehicles. It also provides electric powertrain components and systems; and services for electric vehicles through its company-owned service locations, and Tesla mobile service technicians, as well as sells used vehicles. This segment markets and sells its products through a network of company-owned stores and galleries, as well as through its own Website. The Energy Generation and Storage segment offers energy storage products, such as rechargeable lithium-ion battery systems for use in homes, industrial, commercial facilities, and utility grids; and designs, manufactures, installs, maintains, leases, and sells solar energy generation and energy storage products to residential and commercial customers. It also provides vehicle insurance services, as well as renewable energy. The company was formerly known as Tesla Motors, Inc. and changed its name to Tesla, Inc. in February 2017. Tesla, Inc. was founded in 2003 and is headquartered in Palo Alto, California.
Industry: Auto Manufacturers
Country: USA
Currency: USD

08)


Results
Stock Chart for GOOG
Stock GOOG - Monthly Close
1800
1600
1400
1200
1000
800
600
400
200
0
2014-04-30
2014-08-29
2014-12-31
2015-04-30
2015-08-31
2015-12-31
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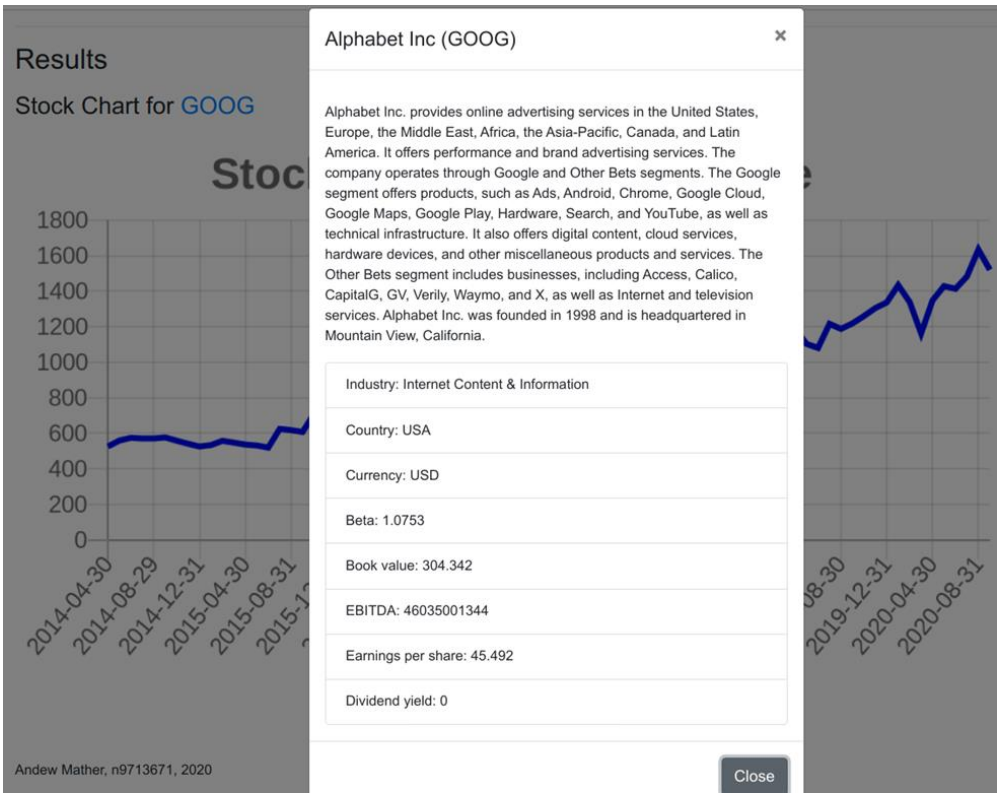
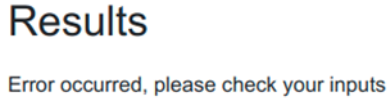
GOOG

09)


Results
Stock Chart for GOOG
Alphabet Inc (GOOG)
Alphabet Inc. provides online advertising services in the United States, Europe, the Middle East, Africa, the Asia-Pacific, Canada, and Latin America. It offers performance and brand advertising services. The company operates through Google and Other Bets segments. The Google segment offers products, such as Ads, Android, Chrome, Google Cloud, Google Maps, Google Play, Hardware, Search, and YouTube, as well as technical infrastructure. It also offers digital content, cloud services, hardware devices, and other miscellaneous products and services. The Other Bets segment includes businesses, including Access, Calico, CapitalG, GV, Verily, Waymo, and X, as well as Internet and television services. Alphabet Inc. was founded in 1998 and is headquartered in Mountain View, California.
Industry: Internet Content & Information
Country: USA
Currency: USD
Beta: 1.0753
Book value: 304.342
EBITDA: 46035001344
Earnings per share: 45.492
Dividend yield: 0
Close
Andew Mather, n9713671, 2020

10)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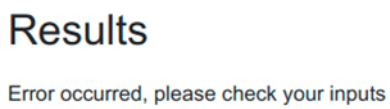
11)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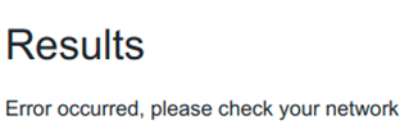
12)


Results
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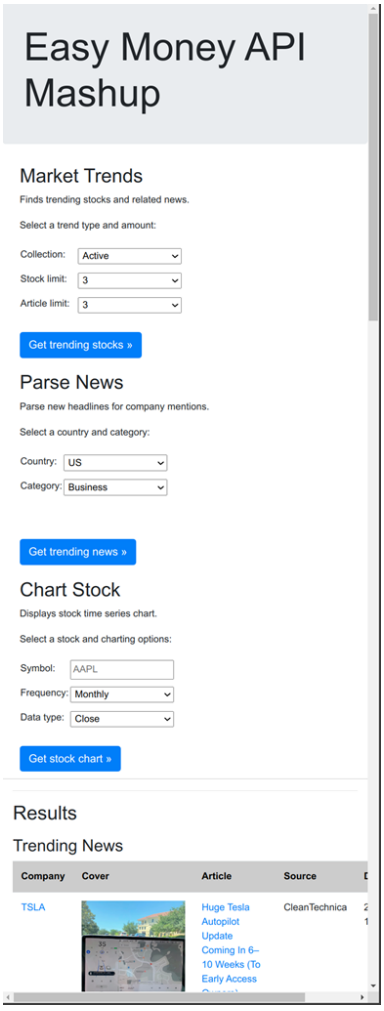
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Select a trend type and amount:
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Stock limit: 3
Article limit: 3
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Parse new headlines for company mentions.
Select a country and category:
Country: US
Category: Business
Get trending news »
Chart Stock
Displays stock time series chart.
Select a stock and charting options:
Symbol: AAPL
Frequency: Monthly
Data type: Close
Get stock chart »
Results
Trending News
Company
Cover
Article
Source
TSLA
Huge Tesla Autopilot Update Coming In 6–10 Weeks (To Early Access
CleanTechnica