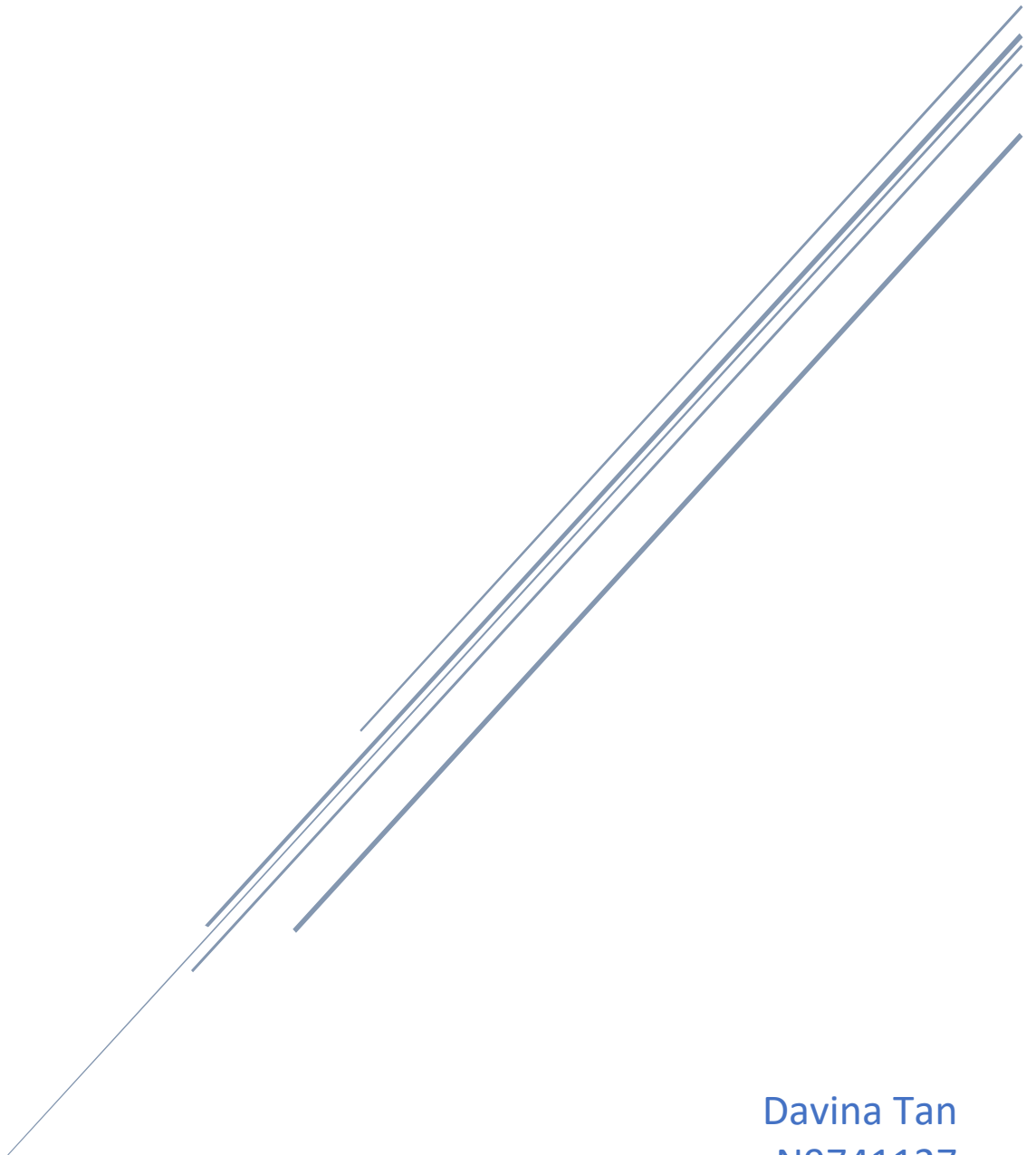


CAB230 STOCKS API

Client-Side Application



Davina Tan

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Due 13/05/2020

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Introduction

Purpose & Description

This assignment involved the development of a React-based web application which allows users to view and analyse stock market statistics. By querying a REST API, the data was able to be drawn and presented to the users using tables and charts. The application contains six main pages: home, stocks, quote, price history, register and login. Navigation to these pages is handled within the navigation bar using React Router. The stocks page lists the available companies along with their symbol and industry. The quote page allows the user to view the latest price information by searching for a specific stock by symbol. The price history page is only available to authenticated users and allows them to sample information within a specified date range. The application also handles authentication using JWT for the login process.

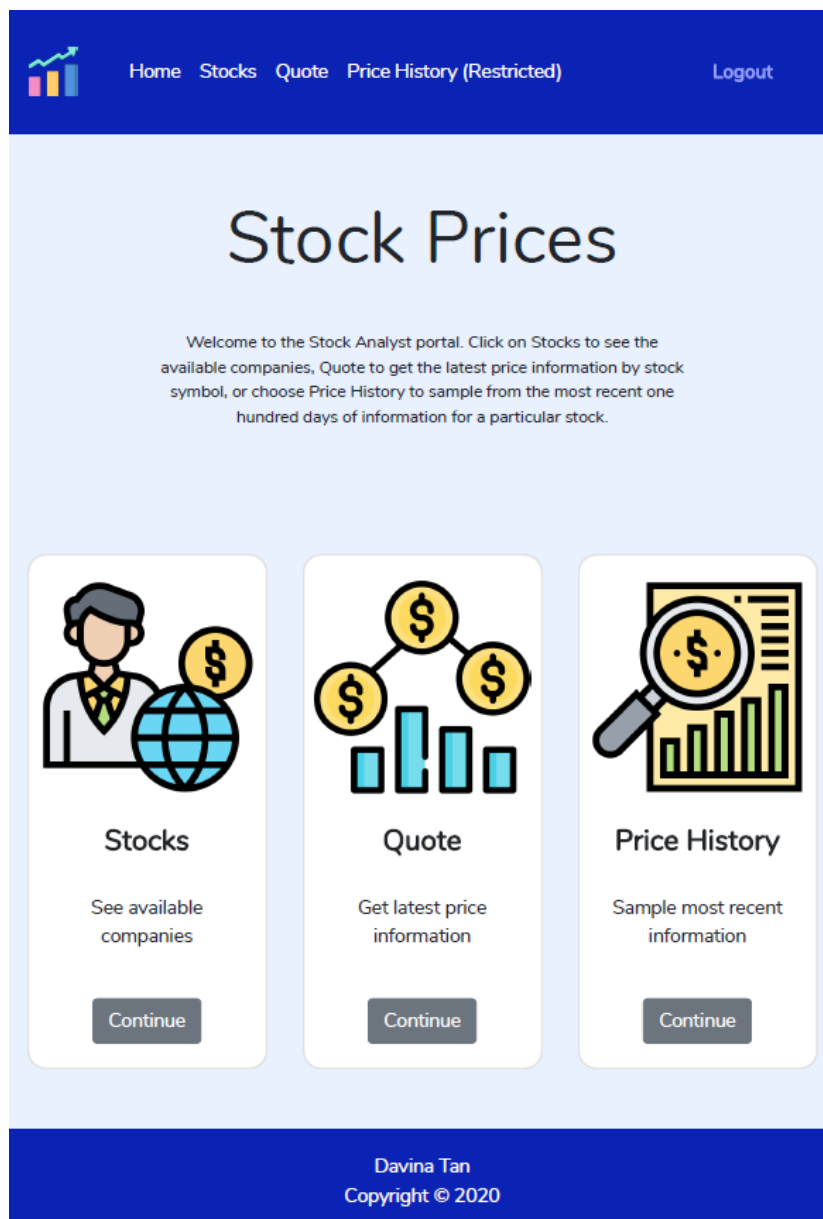


Figure 1 – App homepage

The stocks page allows the user to filter the companies by industry using a search bar or a dropdown menu. The user is also able to sort the table in ascending or descending order by name. The reactstrap package was used to provide React components for Bootstrap. Tables were rendered using the ag-Grid React package. The reactstrap-date-picker package was used for the user to choose dates from a drop-down calendar. The last package used was recharts, to display the price history results on a professional chart.

Completeness and Limitations

This application a grade of 6 or 7 level. All the basics have been implemented and work smoothly. Navigation is handled using React Router and the tables as well as the chart displays the correct information. The authenticated Query route works successfully.

Use of End Points

/stocks/symbols

Stocks

Search Industry Reset Select Industry ▼

Name	Symbol	Industry
Agilent Technologies Inc	A	Health Care
American Airlines Group	AAL	Industrials
Advance Auto Parts	AAP	Consumer Discretionary
Apple Inc.	AAPL	Information Technology
AbbVie Inc.	ABBV	Health Care
AmerisourceBergen Corp	ABC	Health Care
Abbott Laboratories	ABT	Health Care
Accenture plc	ACN	Information Technology
Adobe Systems Inc	ADBE	Information Technology
Analog Devices Inc.	ADI	Information Technology
Archer-Daniels-Midland Co	ADM	Consumer Staples
Automatic Data Processing	ADP	Information Technology
Alliance Data Systems	ADS	Information Technology
Autodesk Inc	ADSK	Information Technology
Ameren Corp	AEE	Utilities
American Electric Power	AEP	Utilities
AES Corp	AES	Utilities
Aetna Inc	AET	Health Care
AFLAC Inc	AFL	Financials
Allergan Plc	AGN	Health Care
American International Group Inc.	AIG	Financials
Apartment Investment & Management	AIV	Real Estate
Assurant Inc	AIZ	Financials
Arthur J. Gallagher & Co.	AJG	Financials
Akamai Technologies Inc	AKAM	Information Technology
Albemarle Corp	ALB	Materials

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Figure 2 – Stocks page

As seen in figure 2 above, the stocks page handles the `/stocks/symbols` endpoint. The page displays the available companies in a three-column formatted table with pagination. The table can be filtered by Industry through the search bar or drop-down menu. By clicking on the 'Name' header in the table, the results can be sorted by ascending or descending order (see Figures 2.2 and 2.3 below).


Name ↑	Symbol	Industry
AT&T Inc	T	Telecommunication Services
CenturyLink Inc	CTL	Telecommunication Services
Verizon Communications	VZ	Telecommunication Services

Figure 2.2 – Results Sorted in Ascending Order

Name ↓	Symbol	Industry
Verizon Communications	VZ	Telecommunication Services
CenturyLink Inc	CTL	Telecommunication Services
AT&T Inc	T	Telecommunication Services

Figure 2.3 – Results Sorted in Descending Order

`/stocks/{symbol}`

 [Home](#) [Stocks](#) [Quote](#) [Price History \(Restricted\)](#) [Register](#) [Login](#)

Quote

Get the latest price information by searching a company by symbol.

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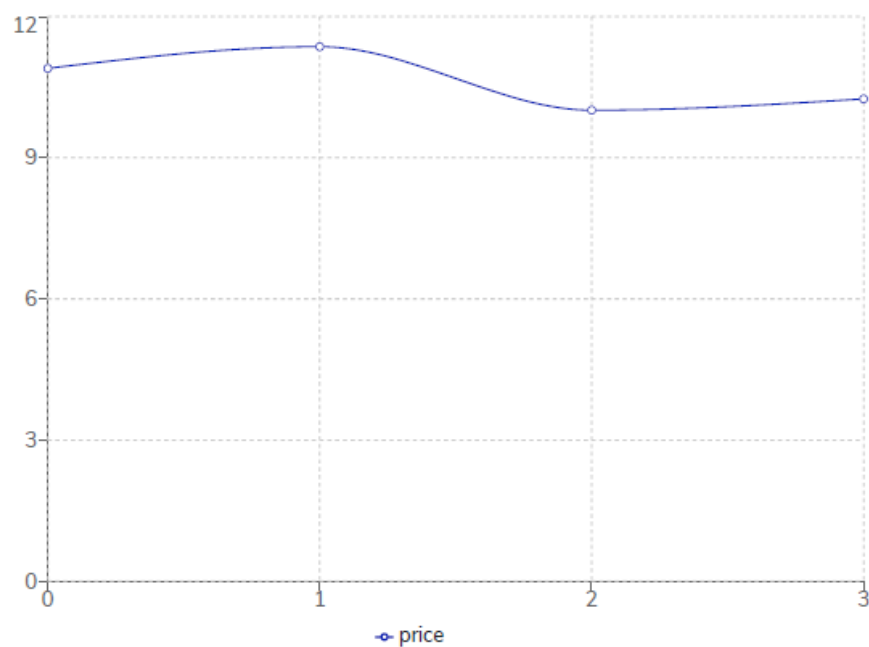
Figure 3 – Quote page

The quote page handles the `/stocks/{symbol}` endpoint. The user can view the latest price information of a company by searching a symbol. The page will display the results in a three-column formatted table along with a chart to show the variation over the day (see figure 3.2 below).



Quote

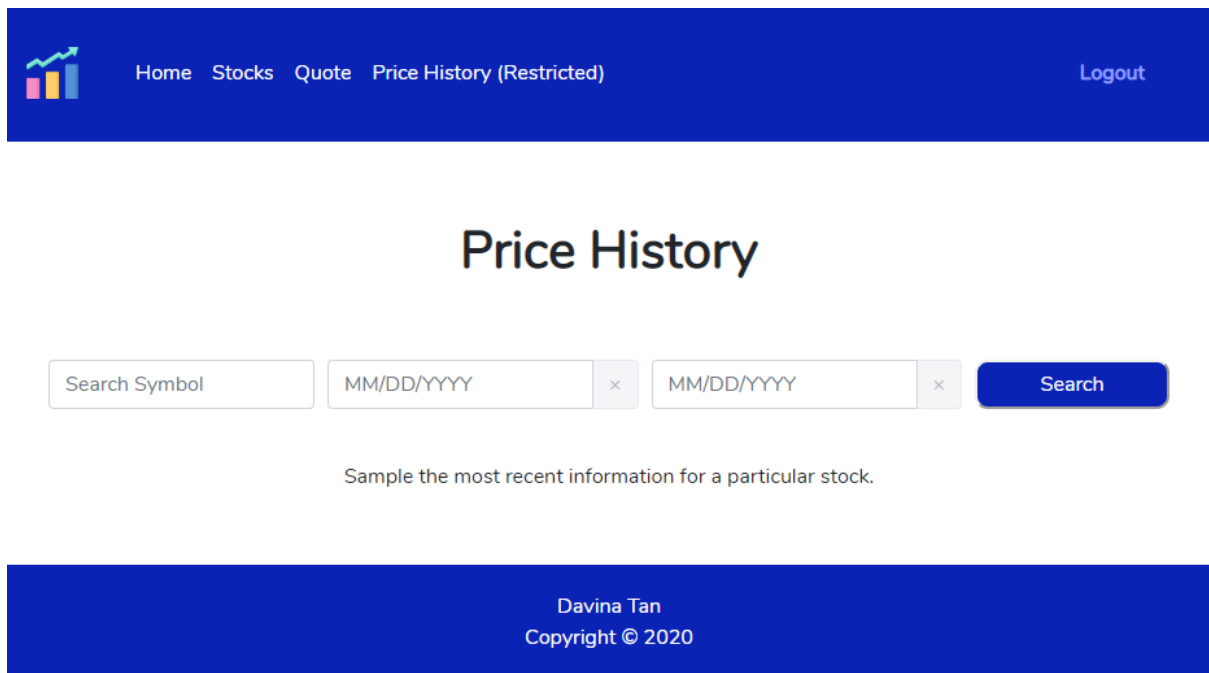
Date	Open	High	Low	Close	Volumes
24/03/2020	10.9	11.36	10.01	10.25	55494100



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Figure 3.2 – Quote page Displaying Results

`/stocks/authed/{symbol}`



The screenshot shows a web application interface for 'Price History'. At the top is a dark blue navigation bar with a logo on the left and links for 'Home', 'Stocks', 'Quote', 'Price History (Restricted)', and 'Logout' on the right. Below the navigation bar, the title 'Price History' is centered in a large, bold, black font. Underneath the title is a search form consisting of a 'Search Symbol' input field, two date pickers (each showing 'MM/DD/YYYY' and a clear 'x' button), and a blue 'Search' button. Below the search form, a line of text reads: 'Sample the most recent information for a particular stock.' At the bottom of the page is a dark blue footer bar containing the text 'Davina Tan' and 'Copyright © 2020'.

Figure 4 – Price History page

The `/stocks/authed/{symbol}` end point is handled by the price history page. This page is only accessible by authorised users who have logged in. If the user is not logged in, they will be redirected to the login page. This page allows the user to search a specific stock between two dates using a search bar and two date pickers. The result is a table as well as a chart which shows the user how the prices track over time (see Figure 4.2 below).

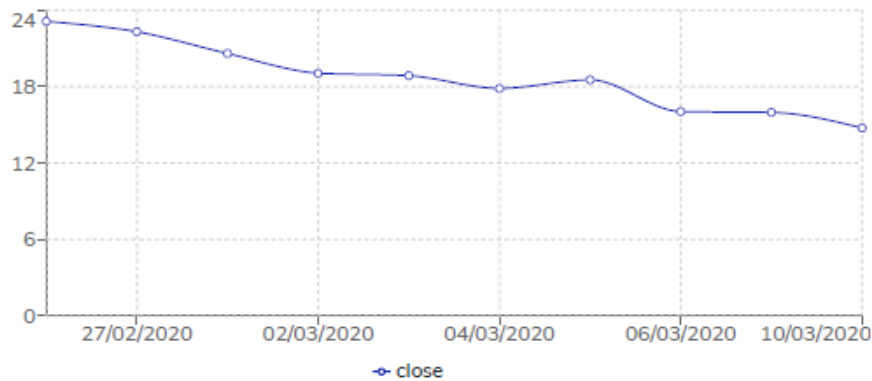


Price History

x

x

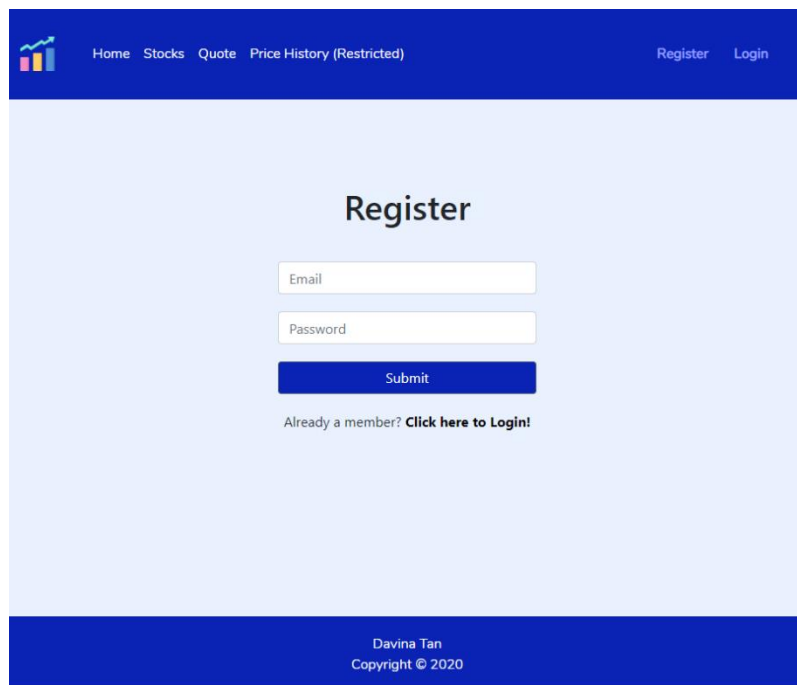
Date	Open	High	Low	Close	Volumes
26/02/2020	25.62	25.75	23.05	23.12	22296900
27/02/2020	23.57	23.75	22.11	22.31	19631400
28/02/2020	20.85	22.48	19.77	20.6	31897300
02/03/2020	19.8	20.35	18.77	19.05	37166400
03/03/2020	19.05	19.06	17.51	18.86	38738000
04/03/2020	19.66	19.79	17.8	17.85	35402500
05/03/2020	18.36	18.55	17.3	18.53	44362100
06/03/2020	17.54	17.65	15.98	16.04	44656800

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Figure 4.2 – Price History Displaying Results

/user/register

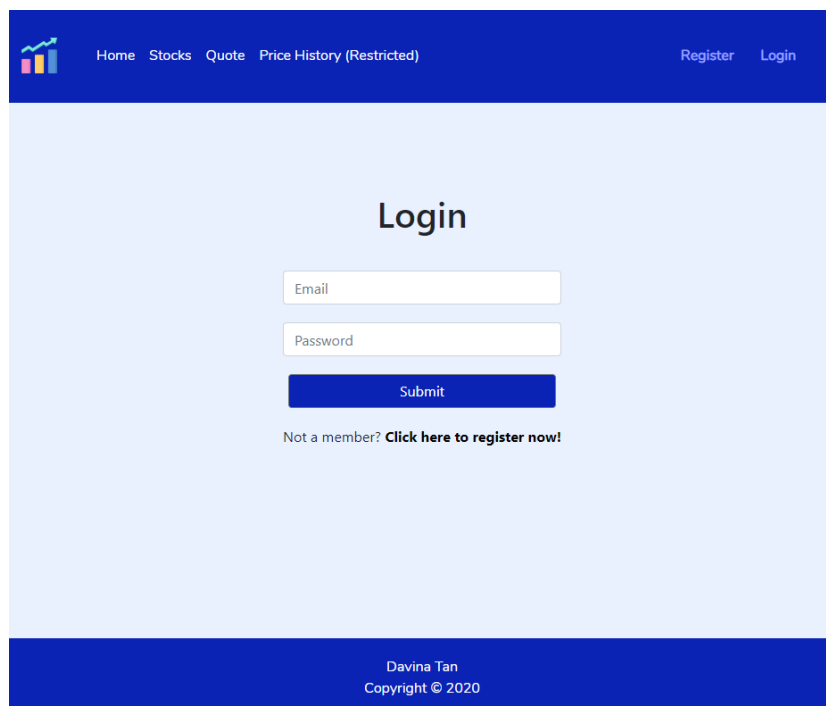


The screenshot shows a web application with a dark blue header and footer. The header contains a logo on the left and navigation links: Home, Stocks, Quote, Price History (Restricted), Register, and Login. The main content area has a light blue background and is titled "Register". It features two input fields for "Email" and "Password", followed by a dark blue "Submit" button. Below the button, there is a link: "Already a member? [Click here to Login!](#)". The footer contains the text "Davina Tan" and "Copyright © 2020".

Figure 5 – Register Page

The register page handles the `/user/register` end point. This page allows the user to register an email that does not currently exist.

/users/login



The screenshot shows a web application with a dark blue header and footer. The header contains a logo on the left and navigation links: Home, Stocks, Quote, Price History (Restricted), Register, and Login. The main content area has a light blue background and is titled "Login". It features two input fields for "Email" and "Password", followed by a dark blue "Submit" button. Below the button, there is a link: "Not a member? [Click here to register now!](#)". The footer contains the text "Davina Tan" and "Copyright © 2020".

Figure 6 – Login Page

The login page handles the `/user/login` end point. This page allows the user to login and use the authenticated route to access the price history page.

Modules used

Ag-grid-react

Module to provide fully-featured table components, including sorting and filtering.

<https://www.ag-grid.com/react-grid/>

Reactstrap

Module to provide Bootstrap 4 components to quickly build professional looking forms for intuitive user experience.

<https://reactstrap.github.io>

Reactstrap-date-picker

Module to allow the user to pick a date easily from a calendar drop down.

<https://www.npmjs.com/package/reactstrap-date-picker>

Recharts

A charting library build on React components to quickly build charts.

<https://recharts.org/en-US/>

Application Design

Navigation and Layout

The design process began with some quick sketches to produce some mockup designs for the overall website (see figures 7.1 and 7.2 below). The aim was to create a simple yet elegantly designed website that looked professional and was also easy to use. A navigation bar at the top of each page was implemented so the user could easily access any page. The home page includes three cards that also allow the user to navigate to the corresponding pages (see figure 7.3 below).

The application begins on the home page, where the user can choose to go between the stocks page, quote page, price history page (restricted), register page and login page. The stocks page allows the user to search an industry through the search bar or a drop-down menu. There is a reset button that resets the table to the default stock list. The Quote page allows the user to search for a specific company by symbol. A chart was added to display the open, high, low and close prices for the results. This allowed the user to see the variations throughout the day easily.

The price history page is an authenticated route that can only be accessed if the user is logged in. If the user is not logged in, the price history page will redirect the user to the login page. The price history page includes a search bar for the symbol of the industry as well as two date pickers. The user may pick the range of dates they wish to see the stocks results and by clicking on the search button, a table and chart will appear displaying the results.

The design of the register page and login page are very similar as they both require the same inputs: email and password. The register page has a link to the login page incase the user has not already registered and vice versa with the register page having a link to the login page if they have already registered. Once the user successfully logs in, they will be redirected to the home page and the navigation bar will change the 'register' and 'login' options to 'logout'.

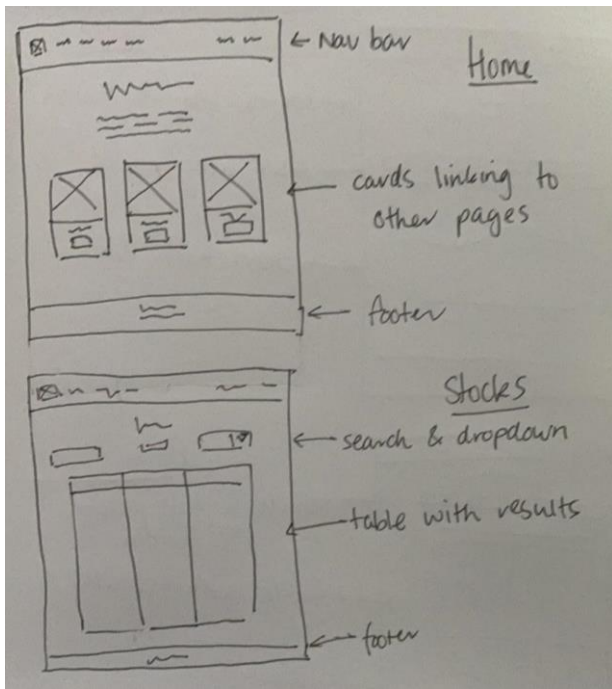


Figure 7.1 – Home page & Stocks page mock-up designs

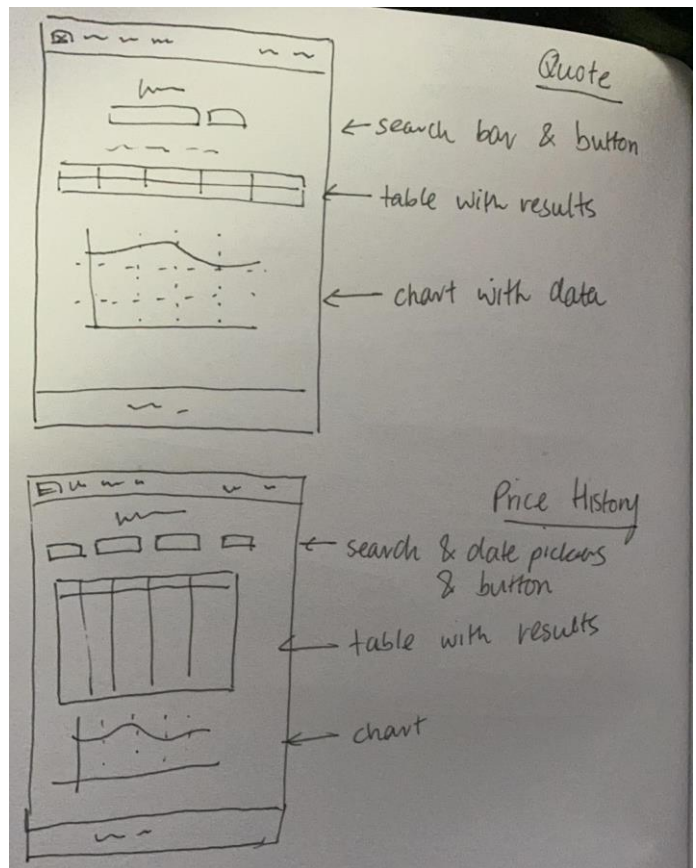


Figure 7.2 – Quote page & Price History page mock-up designs

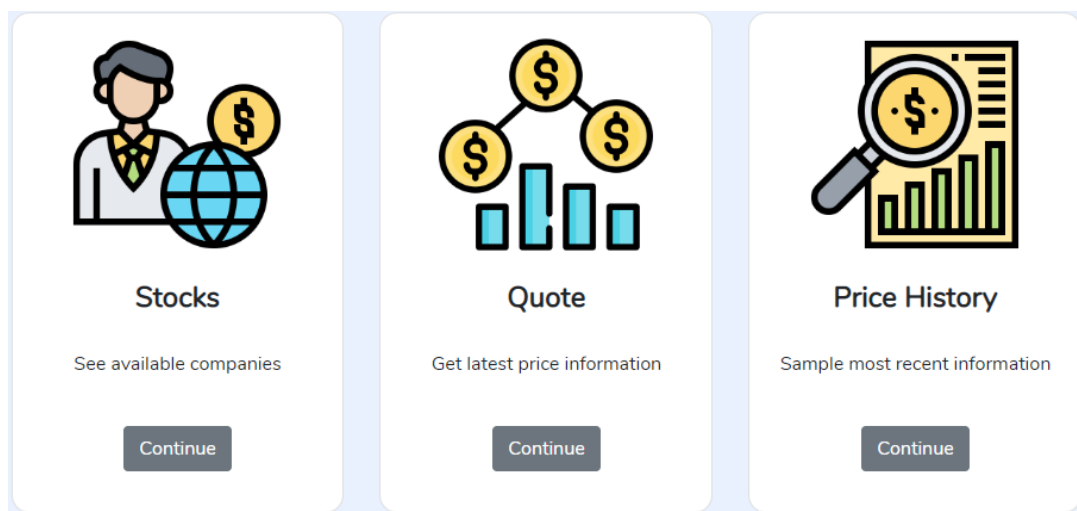


Figure 7.3 – Homepage cards

Technical Description

Architecture

The application is controlled using controlled components which contain the state of data which is passed through to the pages. The src directory (see figure 8.1 below) contains the two folders: components and pages. The components folder includes the components used throughout the app. The pages folder includes each page available to the user. The files were split across these folders to prevent confusion while developing the app.

Three React hooks were created in apiPriceHistory.js, apiQuote.js and apiStocks.js which each handling a different end point for their respective pages. The Stocks, Quote and Price History pages also each had their own search bar component. This was because each search bar had different components. The Stocks search bar includes a drop-down menu and the Price History search bar includes two DatePicker components.

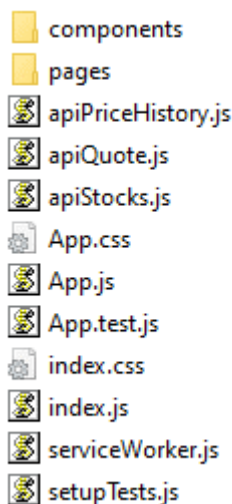


Figure 8.1 – src directory

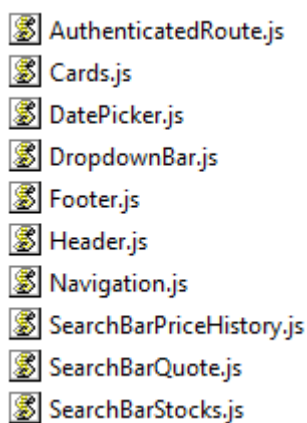


Figure 8.2 – components directory

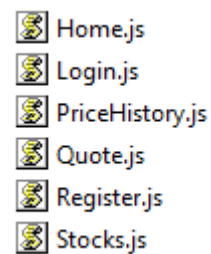


Figure 8.3 – pages directory

Test plan

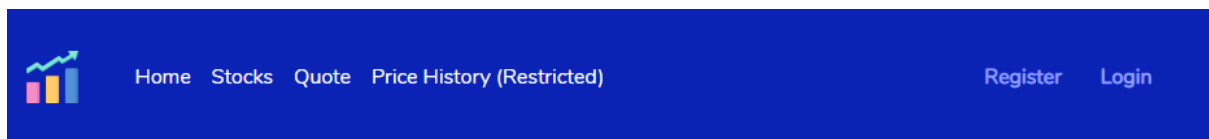
Task	Expected Outcome	Result
Click on Home in navigation bar	Home page is displayed	PASS
Click on Stock in navigation bar	Stocks page is displayed	PASS
Click on Quote in navigation bar	Quote page is displayed	PASS
Click on Price History page in navigation bar	if the user is logged in: Price History page is displayed if the user is not logged in: Redirect to Login page	PASS
Click on Register in navigation bar	Register page is displayed	PASS
Click on Login in navigation bar	Login page is displayed	PASS
Click on Logout in navigation bar	User is logged out	PASS
Click on Stocks 'continue' button on Home page	Stocks page is displayed	PASS
Click on Quote 'continue' button on Home page	Quote page is displayed	PASS
Click on Price History 'continue' button on Home page	Price History page is displayed	PASS
Input in Stocks search bar	Table updates with each letter input, displays tables with filtered industry	PASS
Input does not exist in Stocks search bar	Displays "Industry sector not found" error	PASS
Drop down selection on Stocks page	Displays table with specified industry	PASS
Reset button is clicked on Stocks page	Table resets to all display all companies	PASS
'Name' table header is clicked	Table is sorted in ascending or descending order	PASS
Valid symbol is searched on Quote page	Displays a table and chart with correct data	PASS
Incorrect format is entered in search bar on Quote page	Displays "Error: Stock symbol incorrect format – must be 1-5 capital letters" error	PASS
Symbol that does not exist is searched on Quote page	Displays "No entry for symbol in stocks database"	PASS
Valid symbol and date range are searched on Price History page	Displays a table and chart with correct data	PASS
Invalid symbol or date range are searched on Price History page	Displays "No entries available for query symbol for supplied date range" error	PASS
Valid email and password are entered on Register page	Displays "User successfully registered"	PASS
Email entered already exists	Displays "User already exists" error	PASS
Email or password is not filled out	Displays "Request body incomplete – email and password needed"	PASS
Click on "Click here to Login!" on register page	Login page is displayed	PASS
Valid email and password are entered on Login page	Displays "Login successful" and redirects user to Home page	PASS
Email entered does not exist	Displays "User email not found" error	PASS
Password entered is wrong	Displays "Incorrect password" error	PASS
Email or password is not filled out	Displays "Login info incomplete"	PASS
Click on "Click here to register now!" on Login page	Register page is displayed	PASS
User successfully logs in	Navigation changes 'Register' and 'Login' options to 'Logout'	PASS
Click on Logout in navigation bar	Navigation changes 'Logout' option to 'Register' and 'Login' if user is on Price History page: Redirect to Login page	PASS

Difficulties/Exclusions/Unresolved & Persistent Errors

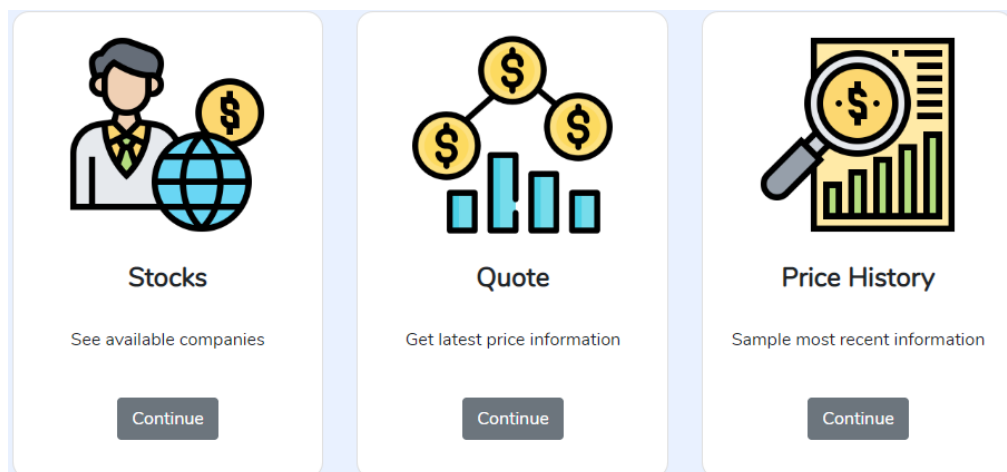
During this assignment there were numerous times where errors would occur, and I was unable to solve them for many hours. A few of these problems were being unable to show the data on the Quote table or Price History table properly and showing the correct errors on the Login/Register pages. Some of these issues were solved with a lot of Googling and others were solved with the help of asking a tutor during a support session or asking a friend for assistance. It was helpful to have someone point me in the right direction whenever I was stuck and unable to move forward with the assignment.

User Guide

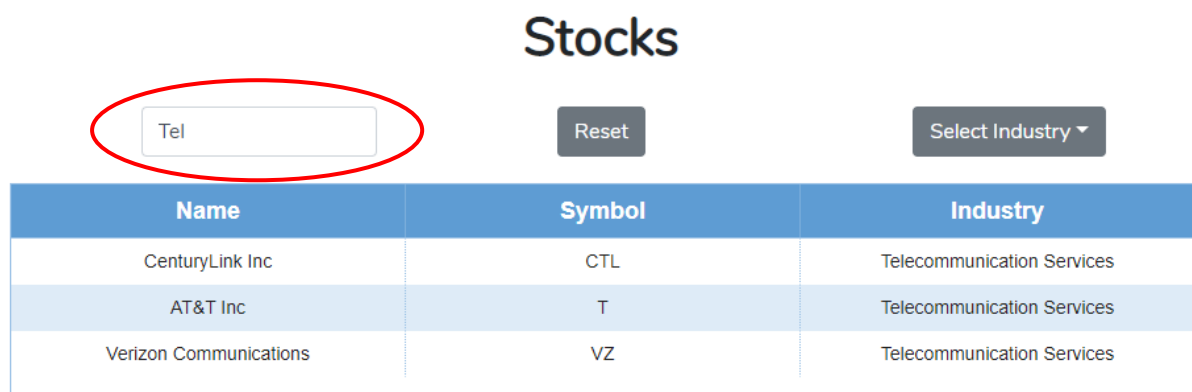
Clicking on each item in the navigation bar will take the user to the specific page. However, the user must be logged in to view the Price History page.



Clicking on 'continue' in each of the cards on the Home page will also bring the user to the specific page.



Entering an input in the search bar on the Stocks page will change the table results with each letter input.



Clicking on the drop-down menu on the Stocks page will bring down a list of Industry options to filter by. Choosing an option will filter the table by the specified industry.

Select Industry ▾

Consumer Discretionary

Consumer Staples

Energy

Financials

Health Care

Industrials

Information Technology

Materials

Real Estate

Telecommunication Services

Utilities

Stocks

Search Industry

Reset

Select Industry ▾

Name	Symbol	Industry
Andeavor	ANDV	Energy
Apache Corporation	APA	Energy
Anadarko Petroleum Corp	APC	Energy
Baker Hughes a GE Company	BHGE	Energy
Chesapeake Energy	CHK	Energy
Cabot Oil & Gas	COG	Energy
ConocoPhillips	COP	Energy
Chevron Corp.	CVX	Energy
Concho Resources	CXO	Energy

Clicking on the 'reset' button will reset the table to show all companies unfiltered.

Stocks

Search Industry

Reset

Select Industry ▾

Name	Symbol	Industry
Agilent Technologies Inc	A	Health Care
American Airlines Group	AAL	Industrials
Advance Auto Parts	AAP	Consumer Discretionary
Apple Inc.	AAPL	Information Technology

Clicking on the 'Name' table header will sort the table results by ascending or descending order.

Name ↑	Symbol	Industry
AT&T Inc	T	Telecommunication Services
CenturyLink Inc	CTL	Telecommunication Services
Verizon Communications	VZ	Telecommunication Services

Name ↓	Symbol	Industry
Verizon Communications	VZ	Telecommunication Services
CenturyLink Inc	CTL	Telecommunication Services
AT&T Inc	T	Telecommunication Services

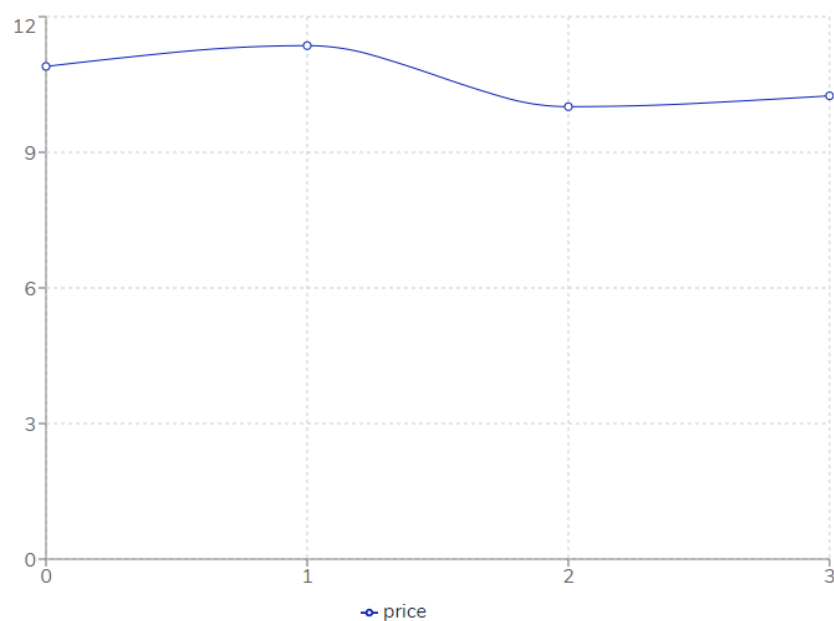
The table also includes pagination that can be managed on the bottom of the table.

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Entering a valid symbol and clicking the search button on the Quote page will display a table and chart with the latest price information of the stock.

Quote

Date	Open	High	Low	Close	Volumes
24/03/2020	10.9	11.36	10.01	10.25	55494100



Entering a valid email and password on the Register page will successfully register a new account.

Register

User successfully registered

Already a member? **Click here to Login!**

Entering a valid email and password on the Login page will log the user in and redirect them to the Home page. The navigation menu will also change to display 'Logout'.

Login

Not a member? **Click here to register now!**

Entering a valid symbol and date range on the Price History page will display a table and chart with the results for the query.

Price History

AAL

02/24/2020

×

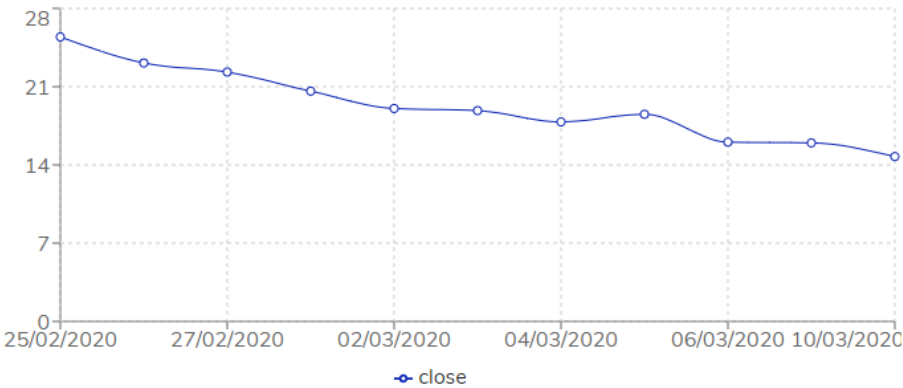
03/10/2020

×

Search

Date	Open	High	Low	Close	Volumes
25/02/2020	25.98	26.11	25	25.45	21713200
26/02/2020	25.62	25.75	23.05	23.12	22296900
27/02/2020	23.57	23.75	22.11	22.31	19631400
28/02/2020	20.85	22.48	19.77	20.6	31897300
02/03/2020	19.8	20.35	18.77	19.05	37166400
03/03/2020	19.05	19.06	17.51	18.86	38738000
04/03/2020	19.66	19.79	17.8	17.85	35402500
05/03/2020	18.36	18.55	17.3	18.53	44362100

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Clicking on Logout in the navigation bar will log the user out and redirect them to the home page.