2020

# CAB230 Stocks API – Client Side

CAB230

Stocks API – Client Side Application

Shaun Mccasker

N9965271

4/23/2020

## Contents

## Introduction

### Purpose & description

The purpose of this application is to implement a user friendly web interface which allows the user to view information about companies within the stock market, and their related stock history. The application should allow for filtering of the stock companies by industry and filtering of any company's stock history by date. Furthermore, users should be able to create an account using their email and log in to said account to access restricted data. Restricted data includes a full list of any companies' stock history as well as a graph which displays the stocks prices by date.

The application functions by accessing and retrieving data from an external API and displaying the data in a well-organized structure. This primarily includes information displayed as table and graphs, as necessary. Registration and logging in are also handled through the API. The API is accessed through 5 endpoints, these endpoints can be found further within the report.

### Completeness and Limitations

The application functions properly and fulfills all requirements as discussed within the previous section. Navigation elements such as the nav bar and links are handled using React Router and React forms are used for data entry. Table elements are implemented and styled using AG-Grid-React and are fully functional. Furthermore, the company list table{{{}}}, in order to navigate from a company to their stock history, is implemented via double clicking the companies row in order to keep the UI simple. However, there were some limitations within the application.

The main limitations include:

- API access error handling, this is logged in the console if u fail to access the API however not displayed on screen. Tables and graphs will load Empty on failure to connect however this will not cause the webpage timeout or break.
- Users accessing a single companies' stocks via inserting a html and not clicking the link will render the error404 page as navigation to these pages is reliant on linking.
- If a user refreshes a page it will log them out.

## Use of End Points

API URL: http://131.181.190.87:3000

| End points | Returned value | Implementation |
|---|---|---|
| GET /stocks/symbols *Refer to Appendix 1* | Returns a list of all recorded companies within the stock market | Values displayed within a table |
| GET /stocks/{symbol} *Refer to Appendix 3* | Returns the most recent stock history, by date, from a chosen company | Values displayed as a single cell graph. |
| GET /stocks/authed/{symbol} *Refer to Appendix 4,5* | Returns a list of all stocks, filtered by date, of a chosen company | Values displayed within a table and graph |
| POST /user/login *Refer to Appendix 6* | Posts a login request using email and password and returns a session token | Values inputted via login from |
| POST /user/register *Refer to Appendix 7* | Posts a registration request using email and password and stores the data as a user | Values inputted via a registration form |

## Modules used

Modules external from core react modules used include

*Ag-grid-react*

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

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

*ReactStrap/Bootstrap*

Module to provide html element styling

https://reactstrap.github.io/

*jsonWebToken*

Module to handle user authentication/sessions

https://www.npmjs.com/package/jsonwebtoken

*datePicker*

Module to provide datePicker search forms

https://www.npmjs.com/package/react-datepicker

*chartjs*

Module to provide Graphing/charting

https://www.chartjs.org/docs/latest/getting-started/installation.html

Application Design

## Application design

The idea for the application design was to create a simple and sleek design for ease of use. The page layouts are all very similar with elements centered and positioned on top of one another. This design also allows for a very smooth transition when handling screen resizing. The color theme chosen is a simple grey scale to follow the theme but also to help the application feel business orientated. The elements themselves are all very simple and only contain what is needed for the user to interact and navigate the application. The initial mockup design can be seen below (image 1).

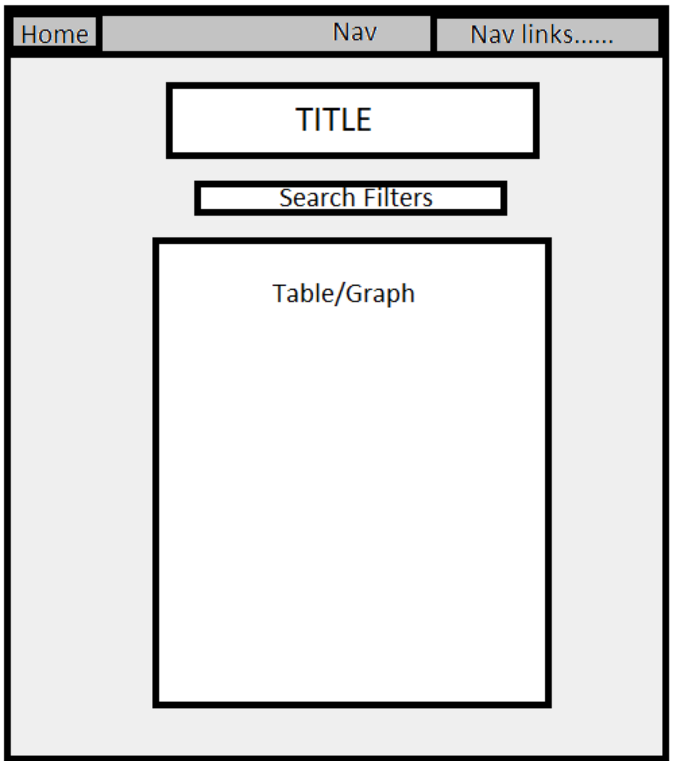


Image 1: initial mockup design

The navigation is handled primarily through a Navigation bar which is also displayed at the top of the screen. From there a user can navigate throughout majority of the application, with the exception of a company's stock history. In order to navigate to a company's stock history the user must double click any cell of a company within the stock company table (*appendix 1*). This choice might be difficult for a user to find, so a popup or notification to let the user now about this feature would prove useful.

There is an issue worth mentioning here in regards to filtering data which arises due to specific user request.

The request given is 'applications which filter data via client side are favored'. This collides with the functionality of the API's endpoint /stocks/authed/{symbol}. As this endpoint uses a start date and an end date in order to access the data, if the data is filtered on client side there is no need to input a date range into the API request. The obvious solution or way to filter this data would be to filter the data by inputting a date range into the API request and only returning the required data. This method would also be efficient in terms of scalability as when more stocks are added to the website fetching large data sets may result in a sluggish response. However, As the requirement specifically requested client-side filtering, filtering is done in this method. The input for the start date and end date for the API request are:

Start Date: CURRENT earliest stock date within the data set. This value is fixed in order to prevent the user from fetching large data sets incase of the API updating.

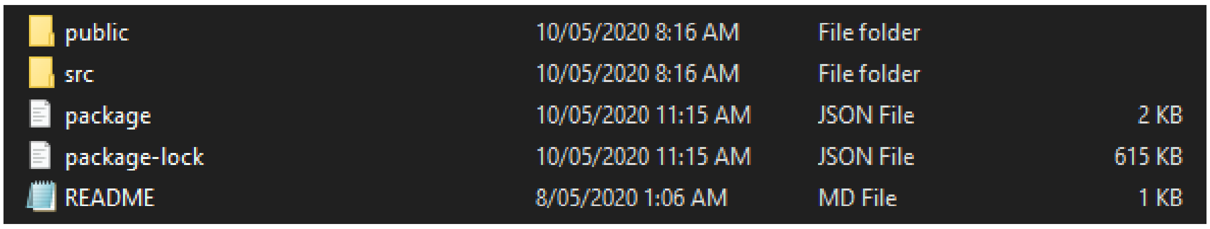
End Date: current date. This value is the current date as it very likely the API will update to recent stock history.

<u>It is highly recommended to update this requirement and hence the related code in order to make sure the application can run smoothly in case of an update to the API.</u>

## Technical Description

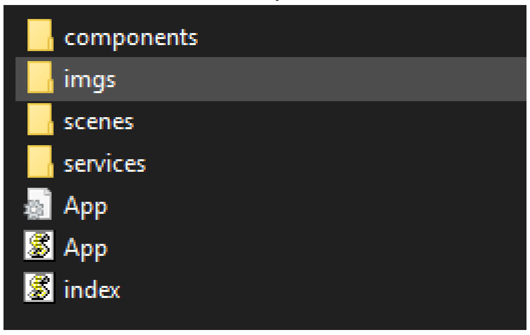
Architecture

The applications folder structure is as below

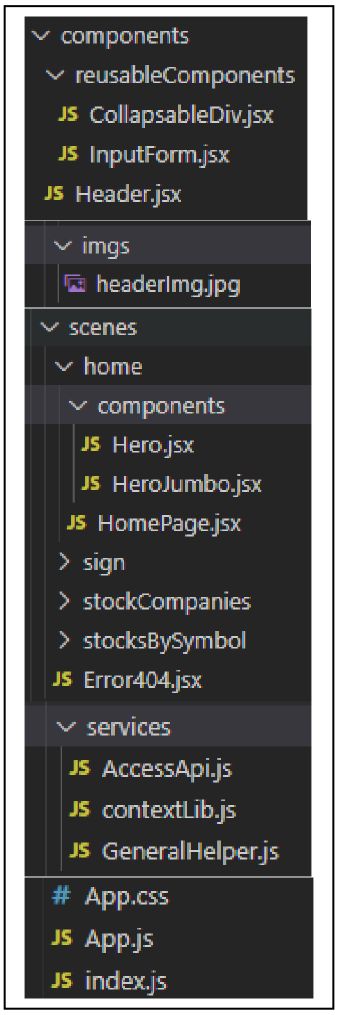


|  |  |  |  |
|---|---|---|---|
| public | 10/05/2020 8:16 AM | File folder |  |
| src | 10/05/2020 8:16 AM | File folder |  |
| package | 10/05/2020 11:15 AM | JSON File | 2 KB |
| package-lock | 10/05/2020 11:15 AM | JSON File | 615 KB |
| README | 8/05/2020 1:06 AM | MD File | 1 KB |

Within the src directory there are 4 folders and 3 files;



```
components
imgs
scenes
services
App
App
index
```



```
components
  reusableComponents
    CollapsableDiv.jsx
    InputForm.jsx
  Header.jsx
imgs
  headerImg.jpg
scenes
  home
    components
      Hero.jsx
      HeroJumbo.jsx
    HomePage.jsx
  sign
  stockCompanies
  stocksBySymbol
  Error404.jsx
services
  AccessApi.js
  contextLib.js
  GeneralHelper.js
App.css
App.js
index.js
```

**Components** – this folder contains a sub folder reusablesComponents, which contains components used within multiple scenes. Components outside reusableComponents are called directly in App.js.

**Imgs** – Simple folder containing images for the application

**Scenes** – this folder contains each page Routed within app.js and rendered in index.js. The pages are contained in sub folders; home, sign, stockCompanies and stocksBySymbol. Each sub folder Contains the main page which is passed to App.js, aswell as a components folder which contains components that handle functionality for that page. The file error404 is a scene which has no components and as it is very simple was not nested in its own folder

**Services** – This folder contains 3 files; accessApi, generalHelper and contexLib. These files contain JavaScript functions, they do not return a react element and are called within all scenes.

**App.js** is the main application element which oversees Routing.
**App.css** includes styling for the application
**Index.js** renders the application

## Test plan

| TASK | EXPECTED OUTCOME | RESULT | SCREENSHHOT APPENDIX id |
|---|---|---|---|
| Render a page | Page to be fully rendered and styled | PASS | Any no. |
| Nav Bar navigate correctly | Upon clicking a navbar element the page is routed respectively | PASS | |
| Errorr404 | Invalid link returns error404 page | PASS | 11 |
| **API** | | | |
| GET API endpoint /stocks/symbols | Api is connected to and a response is received (whether error or success) | PASS | 1 |
| GET API endpoint /stocks/{symbol} | Api is connected to and a response is received (whether error or success) | PASS | 3 |
| GET API endpoint /stocks/authed/{symbol} | Api is connected to and a response is received (whether error or success) | PASS | 4, 5 |
| POST API endpoint /user/register | Api is connected to and a response is received (whether error or success) | PASS | 14 |
| POST API endpoint /user/login | Api is connected to and a response is received (whether error or success) | PASS | 14 |
| **Displaying Data** | | | |
| Display data fetched from API endpoint /stocks/symbols | Data from api is displayed in a table. Styled to be in center of screen and to display all parameters of the data retrieved | PASS | 1 |
| Display data fetched from API endpoint /stocks/{symbol} | Single data object is returned and displayed in a table in the center of screen. Parameters timestamp, open ,close, high ,low, volumes is dislayed | PASS | 3 |
| Display data fetched from API endpoint /stocks/authed/{symbol} if authed | All data is returned and displayed in a table and graph in the center of screen. Parameters timestamp, open ,close, high ,low, volumes is dislayed | PASS | 4, 5 |
| **Filter Data** | | | |
| Company list table is filterable by industry | Select an industry via dropdown or textinput and data is displayed from the selected industry | PASS | 8, 9 |
| Stock list table and graph is filterable by date | Select 2 dates and data is displayed between the 2 dates | PASS | 12,1 |
| Auth | | | |
| User is able to login and session token is stored | Given valid input the user is authed and token is create | PASS | 14 |
| User is able to create an account and login with it | User data is inputted and stored within the API, data is then applicable for login | PASS | 14 |
| Display authentication errors | On incorrect data input for login or signup error message is displayed accordingly | PASS | 15,16,17,18 |
| Other | | | |
| User session is maintained until closing or expiry | The use should be able to refresh or leave page and come back within a short time and still be logged in | FAIL | |
| inputting a http address for a /stocks/{symbol} will return the stock | The stock table and or graph display upon inputting a valid https address | PASS | 19 |

## Difficulties / Exclusions / unresolved & persistent errors /

The major roadblocks included;

- updating graphs and table dynamically
  - Having the stocks table and graph update dynamically on date Input changing. This proved troublesome as the useEffect for date changing was being called after the filtering of data, resulting is the data updating 1 input behind the user. To solve this I moved the filtering of data inside the date input component and set the useeffect to be called whenever the date input was changed. The filtered data could be accessed from the parent component and be sent to both the stock graph and table.
- restructuring application to better organize components.
  - Having all my components within a component folder proved to be difficult to manage, especially since many of the components were unique to a page/scene. To fix this I restructured my project to the current structure however this resulted in having to change which components would be child and parent and resulted in re-completing my previous code.

The Major functionality bugs/issues;

- Keeping user sessions stored on refresh
  - Upon a refresh a user would be logged out. As I couldn't find a way to solve this problem this Is a current issue within the application
- Navigation by inputting a http address
  - Inputting an address when searching for stocks via symbol will not return the expected page. This is because the API endpoint is not accessed when the page is loaded but the symbol itself is defined/set when the user selects on the company table. This is a current issue within the application

## Extensions

In the Future the application should change its filtering by date to fetch the data from the API when filtering rather then client side. Furthermore all bugs can be fixed to polish up the application.

More pages and components can be added especially with the use of different or a more extensive API. Components such as Real time News for companies, a top and worst performing stocks table and Links to the companies reports and financials can be implemented.

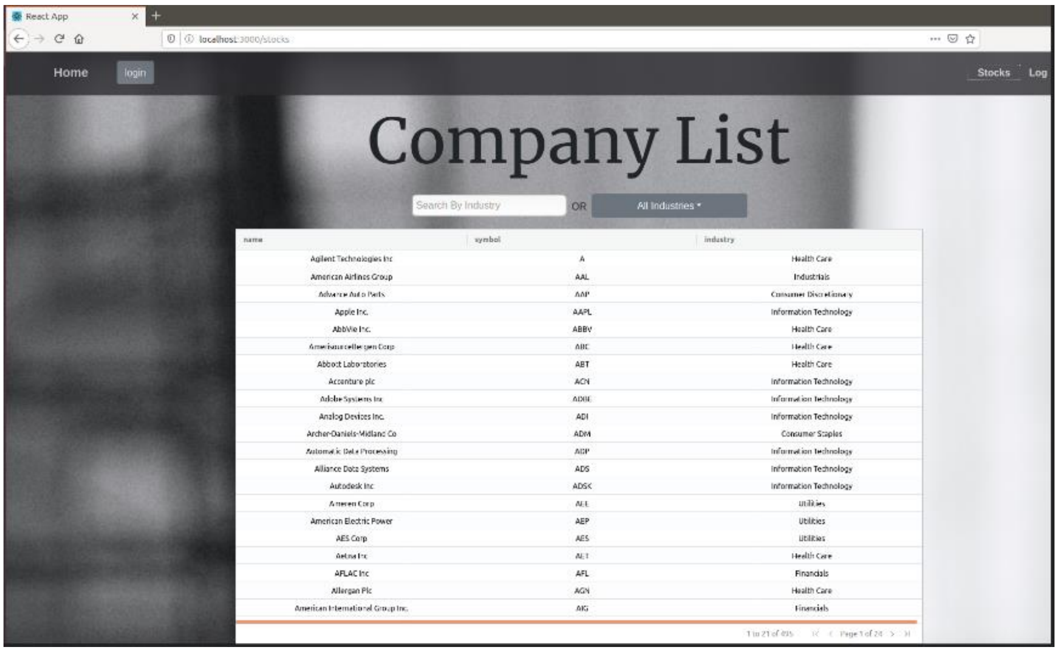
## User guide

- Navigation
    - The Nav bar navigates to the main pages via nav buttons
    - To navigate to a companies stocks double click the selected company (anywhere on the row) from the Company List table (Appendix no.1 )
    - The graph for to display a companies stock will display when u click the ‘View Graph’ button (Appendix no.4)
- Filtering
    - The data will update upon change of any search form just input the desired information into the search form and the table will update (Appendix no.8,9,12)
- User sessions
    - To sign up navigate to the signup page and input your data. Will only take emails with the ‘@’ symbol eg; “email@qut.com”.
    - To Log in navigate to the login page and input your data.
    - To submit press enter will forms filled in or press log in button
    - To log out click button at top left. (will only appear if u are logged in)

(Refer to the video if this is hard to understand)

## Appendices

1) Company List at Full screen



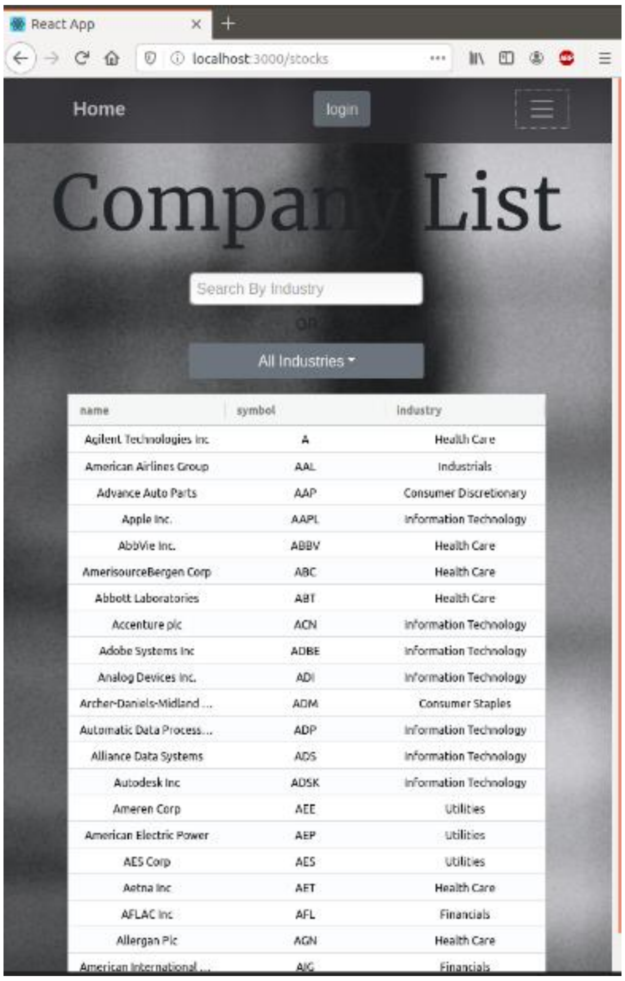
# Company List

Search By Industry OR All Industries

| 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 |

1 to 21 of 495 Page 1 of 24

2) Company List At ¼ screen



# Company List

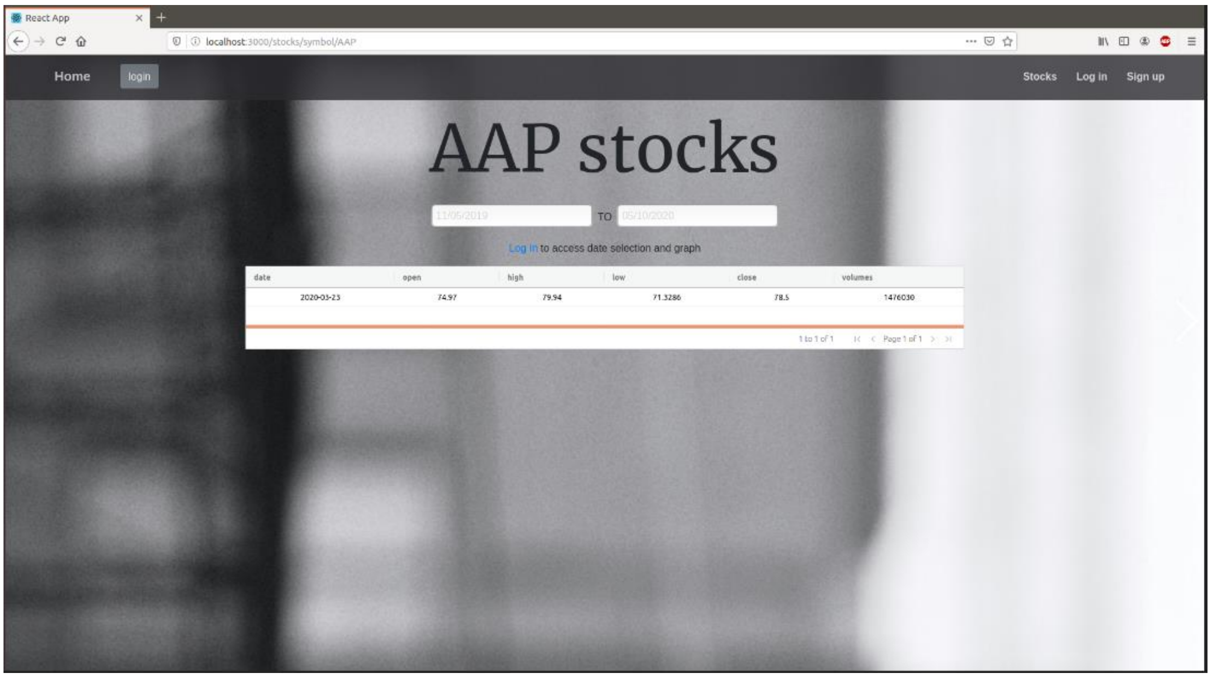
Search By Industry

OR

All Industries

| 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 ... | ADM | Consumer Staples |
| Automatic Data Process... | 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 ... | AIG | Financials |

3) Single Stock returned when not authenticated via /stocks/{symbol}



AAP stocks

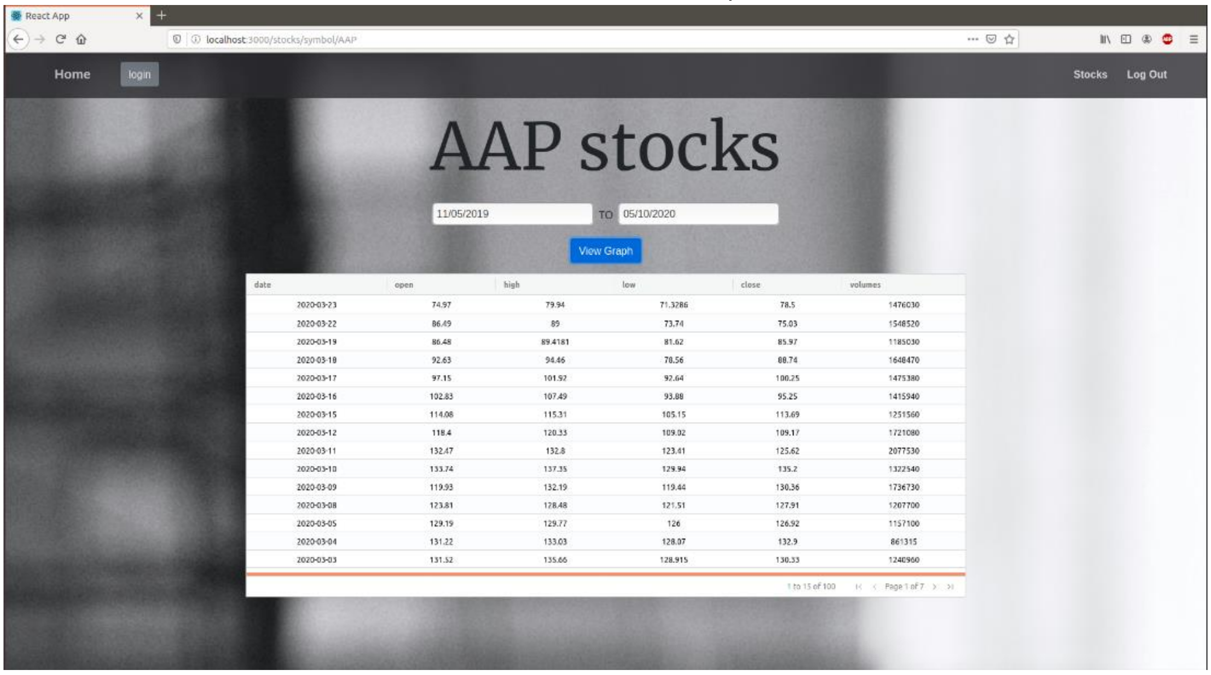
11/05/2019 TO 05/10/2020

Log in to access date selection and graph

| date | open | high | low | close | volumes |
|---|---|---|---|---|---|
| 2020-03-23 | 74.97 | 79.94 | 71.3286 | 78.5 | 1476030 |

1 to 1 of 1 Page 1 of 1

4) All stocks returned when authenticated via /stocks/authed/symbol



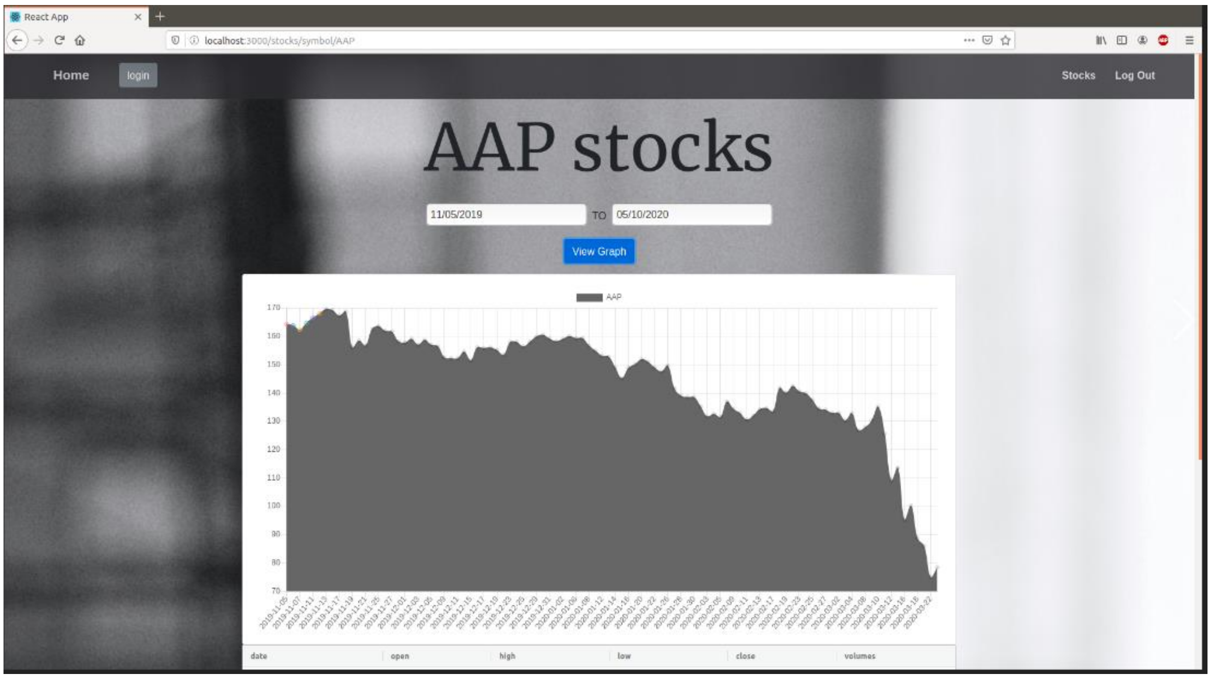
AAP stocks

11/05/2019 TO 05/10/2020

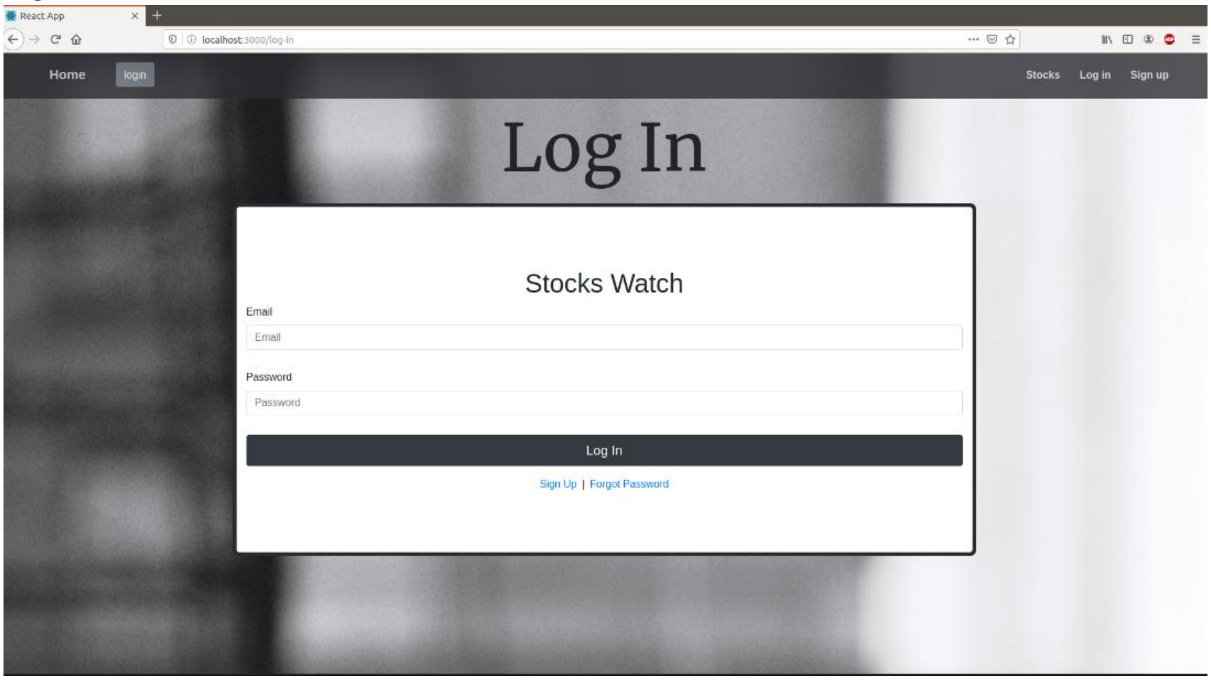
| date | open | high | low | close | volumes |
|---|---|---|---|---|---|
| 2020-03-23 | 74.97 | 79.94 | 71.3286 | 78.5 | 1476030 |
| 2020-03-22 | 86.49 | 89 | 73.74 | 75.03 | 1548520 |
| 2020-03-19 | 86.48 | 89.4181 | 81.62 | 85.97 | 1185030 |
| 2020-03-18 | 92.63 | 94.46 | 78.56 | 88.74 | 1648470 |
| 2020-03-17 | 97.15 | 101.92 | 92.64 | 100.25 | 1475380 |
| 2020-03-16 | 102.83 | 107.49 | 93.88 | 95.25 | 1415940 |
| 2020-03-15 | 114.08 | 115.31 | 105.15 | 113.69 | 1251560 |
| 2020-03-12 | 118.4 | 120.33 | 109.02 | 109.17 | 1721080 |
| 2020-03-11 | 132.47 | 132.8 | 123.41 | 125.62 | 2077530 |
| 2020-03-10 | 133.74 | 137.35 | 129.94 | 135.2 | 1322540 |
| 2020-03-09 | 119.93 | 132.19 | 119.44 | 130.36 | 1736730 |
| 2020-03-08 | 123.81 | 128.48 | 121.51 | 127.91 | 1207700 |
| 2020-03-05 | 129.19 | 129.77 | 126 | 126.92 | 1157100 |
| 2020-03-04 | 131.22 | 133.03 | 128.07 | 132.9 | 861315 |
| 2020-03-03 | 131.52 | 135.66 | 128.915 | 130.33 | 1240960 |

1 to 15 of 100 Page 1 of 7

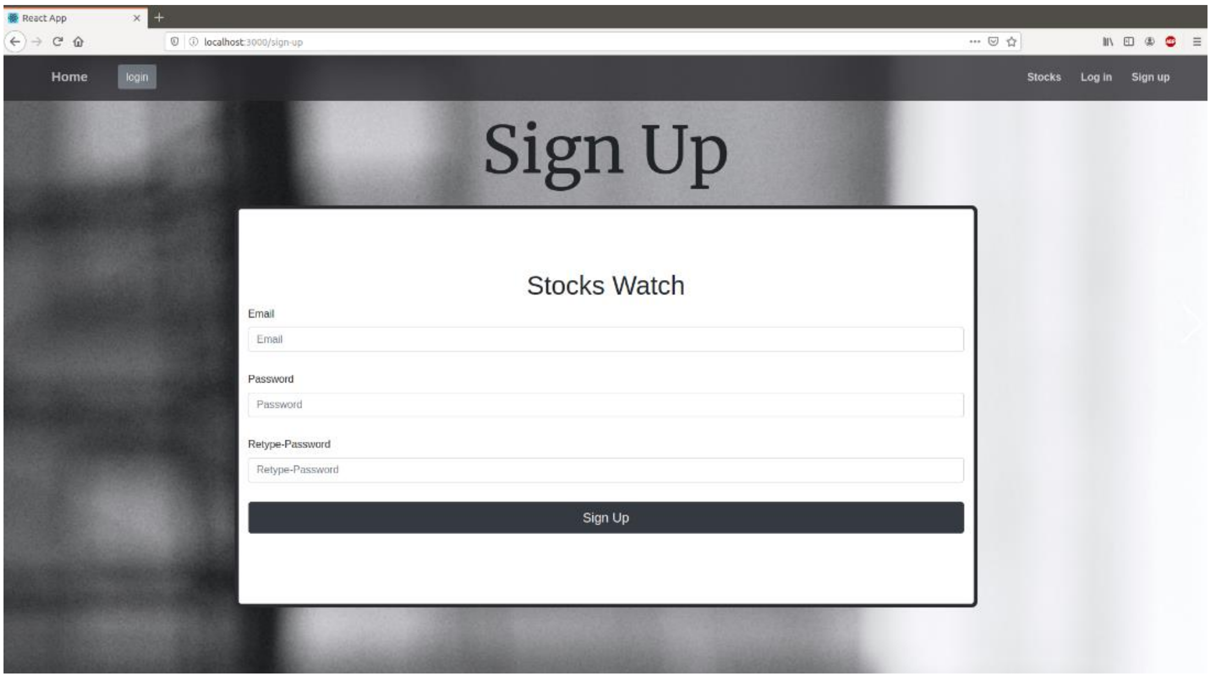
5) All stocks returned as graph when authenticated via /stocks/authed/symbol



6) Login Form



7) sign up form



Sign Up

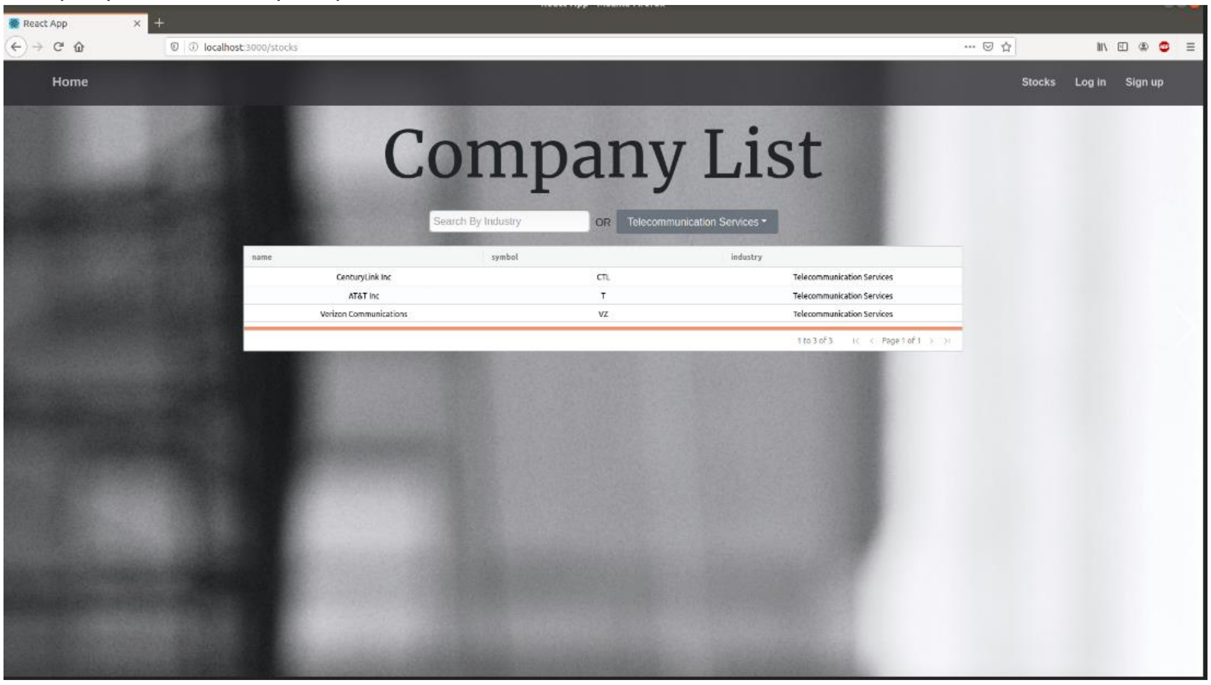
Stocks Watch

Email: Email

Password: Password

Retype-Password: Retype-Password

8) Company list filtered by dropdown menu

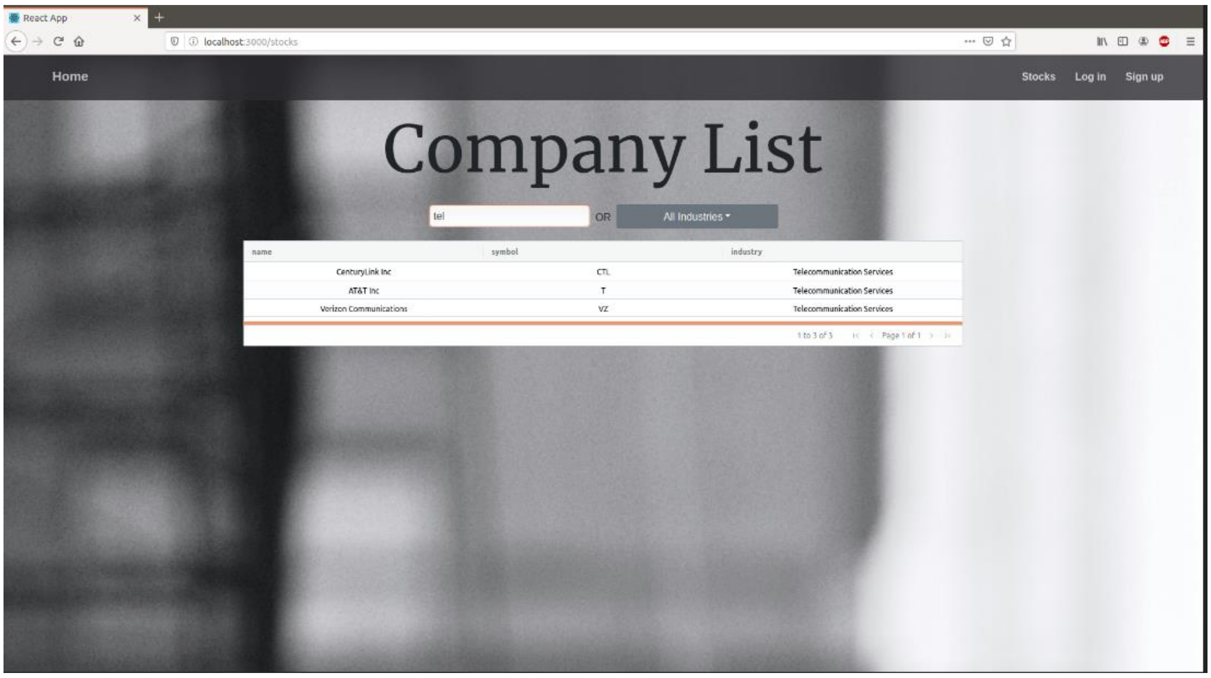


Company List

| name | symbol | industry |
|---|---|---|
| CenturyLink Inc | CTL | Telecommunication Services |
| AT&T Inc | T | Telecommunication Services |
| Verizon Communications | VZ | Telecommunication Services |

1 to 3 of 3 Page 1 of 1

9) Company list filtered by search bar



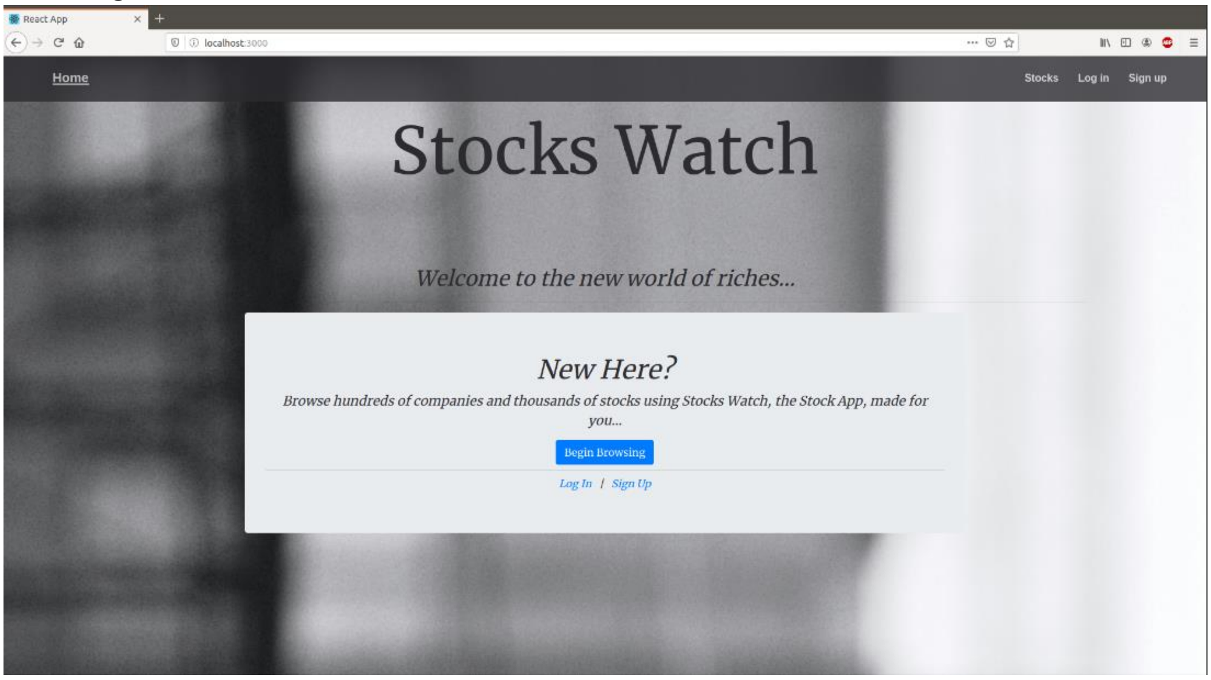
Company List

tel OR All Industries

| name | symbol | industry |
|---|---|---|
| CenturyLink Inc | CTL | Telecommunication Services |
| AT&T Inc | T | Telecommunication Services |
| Verizon Communications | VZ | Telecommunication Services |

1 to 3 of 3 Page 1 of 1

10) Home Page



Stocks Watch

*Welcome to the new world of riches...*

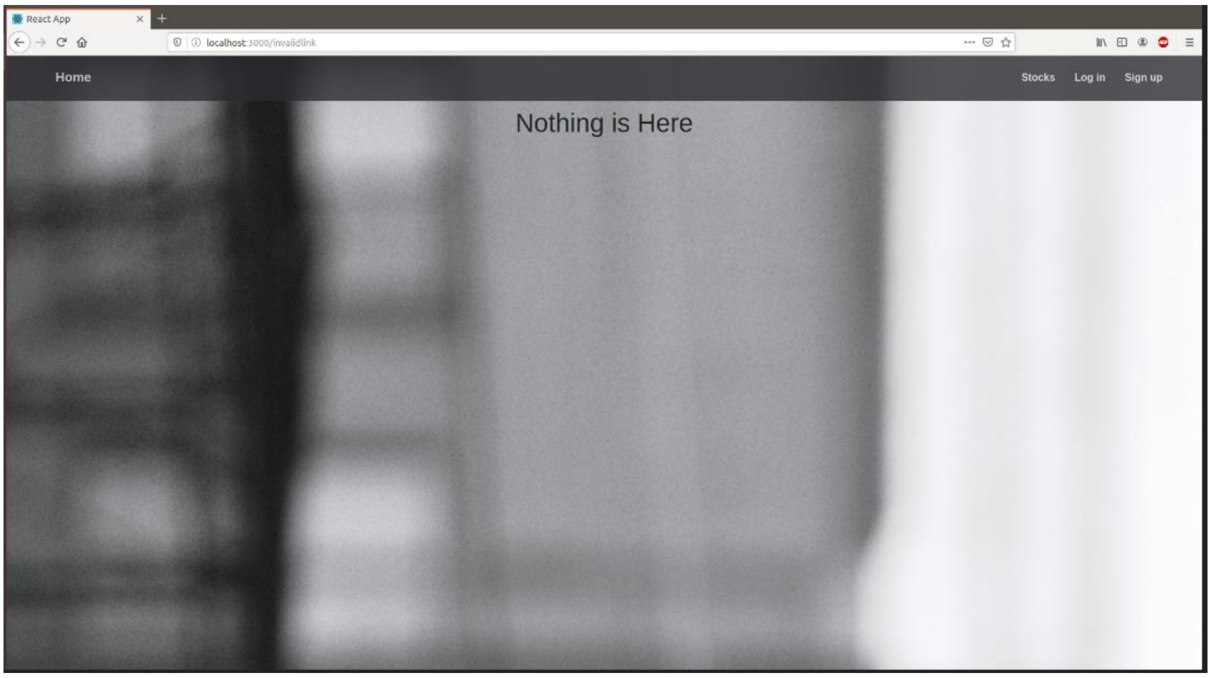
*New Here?*

*Browse hundreds of companies and thousands of stocks using Stocks Watch, the Stock App, made for you...*

Begin Browsing

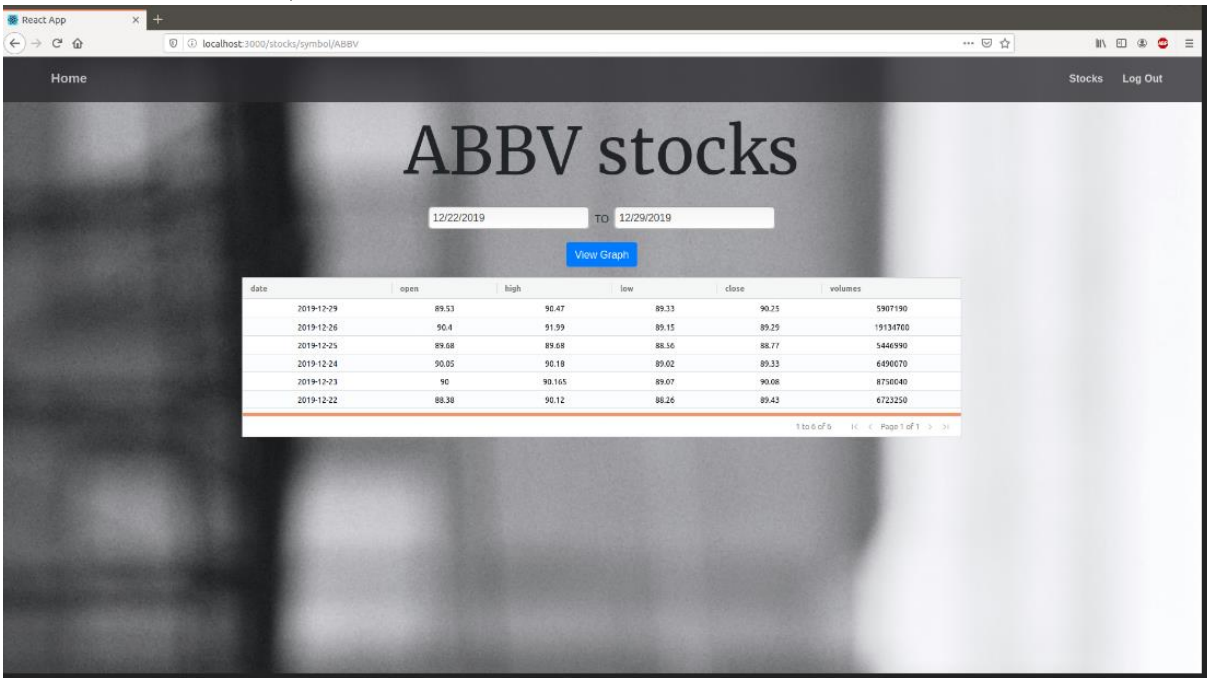
*Log In* | *Sign Up*

11) Error404page



Nothing is Here

12) All stock table filtered by date



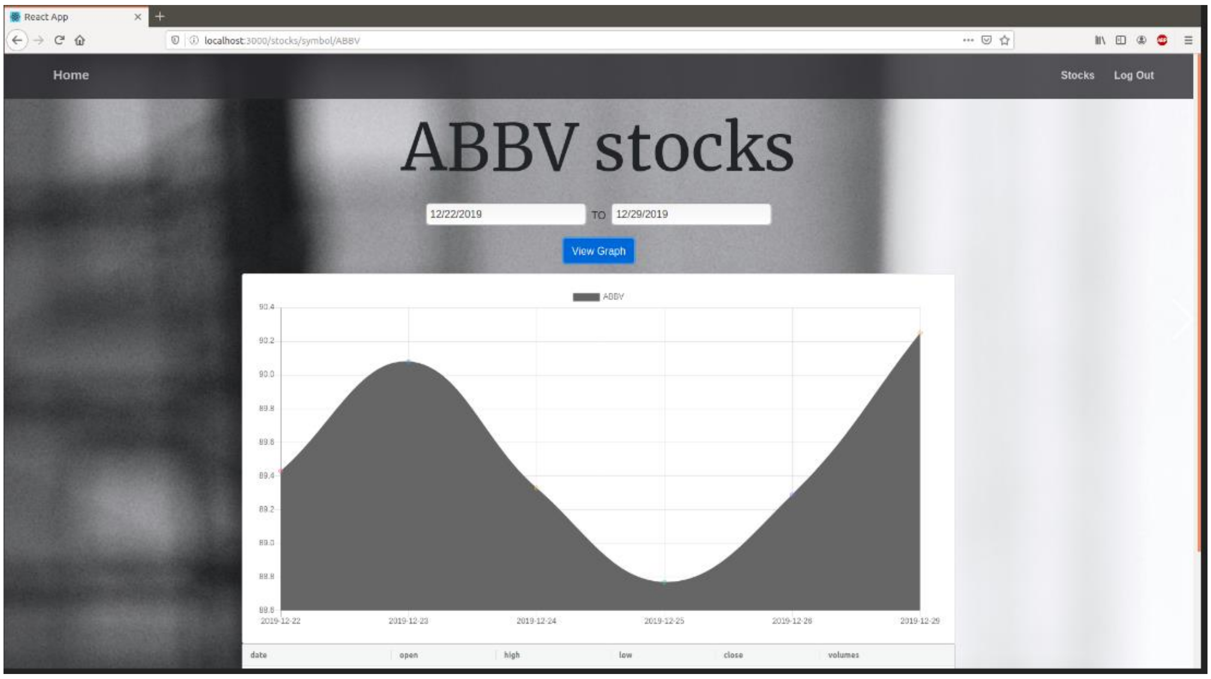
ABBV stocks

12/22/2019 TO 12/29/2019

| date | open | high | low | close | volumes |
|---|---|---|---|---|---|
| 2019-12-29 | 89.53 | 90.47 | 89.33 | 90.25 | 5907190 |
| 2019-12-26 | 90.4 | 91.99 | 89.15 | 89.29 | 19134700 |
| 2019-12-25 | 89.68 | 89.68 | 88.56 | 88.77 | 5446990 |
| 2019-12-24 | 90.05 | 90.18 | 89.02 | 89.33 | 6490070 |
| 2019-12-23 | 90 | 90.165 | 89.07 | 90.08 | 8750040 |
| 2019-12-22 | 88.38 | 90.12 | 88.26 | 89.43 | 6723250 |

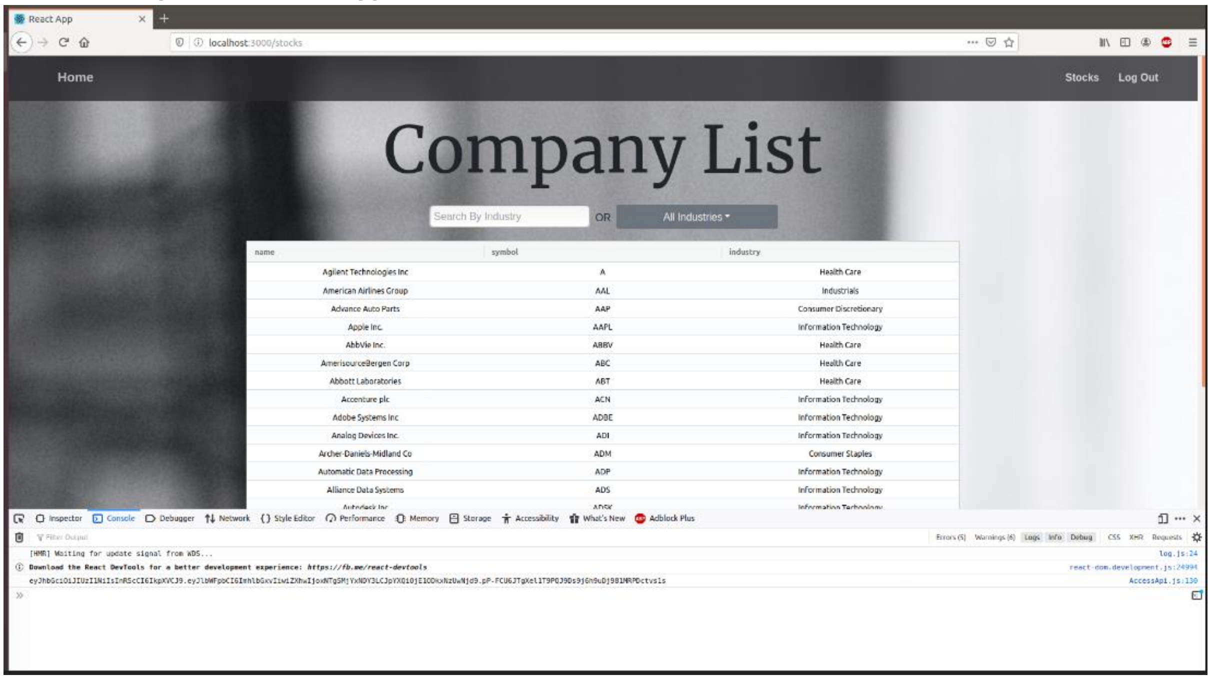
1 to 6 of 6 Page 1 of 1

13) All stocks graph filtered by date



| date | open | high | low | close | volumes |
|---|---|---|---|---|---|

14) Successful login with token logged

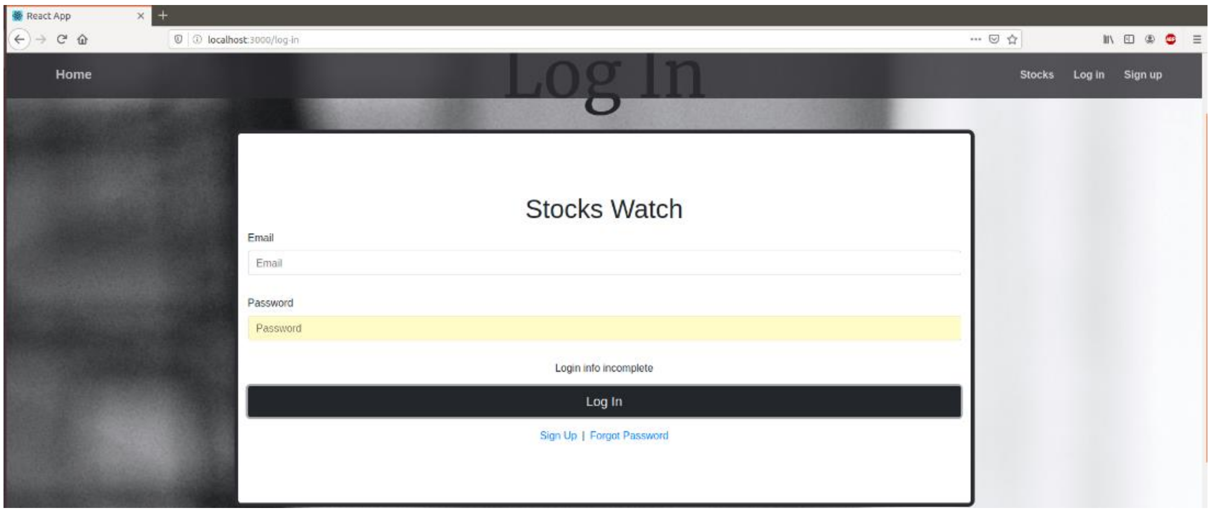


# Company List

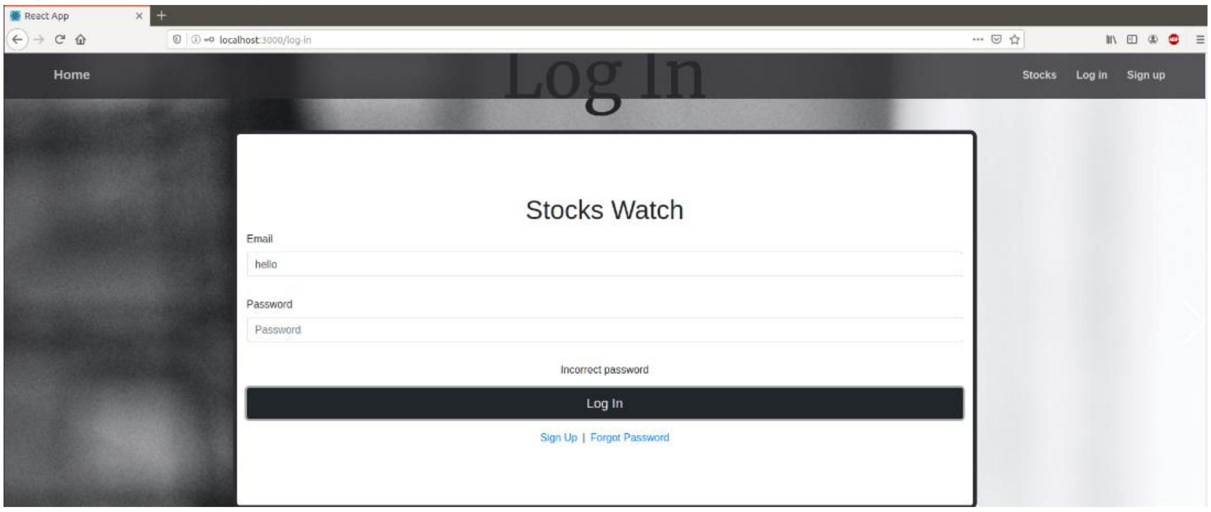
| name | symbol | industry |
|---|---|---|
| Agilent Technologies Inc | A | Health Care |
| American Airlines Group | AAL | Industrials |
| Advance Auto Parts | AAP | Consumer Discretionary |
| Apple Inc. | AAPL | Information Technology |
| AbbVie Inc. | ABBV | Health Care |
| AmerisourceBergen Corp | 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 |

```
[HMR] Waiting for update signal from WDS...                                                    log.js:24
Download the React DevTools for a better development experience: https://fb.me/react-devtools   react-dom.development.js:24994
eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJlbWFpbCI6ImhlbGxvIiwiZXhwIjoxNTgSMjYxNDY3LCJpYXQiOjE1ODkxNzUwNjd9.pP-FCU6JTgXel1T9PQJ9Ds9j6h9uDj981MRPDctvs1s   AccessApi.js:130
```

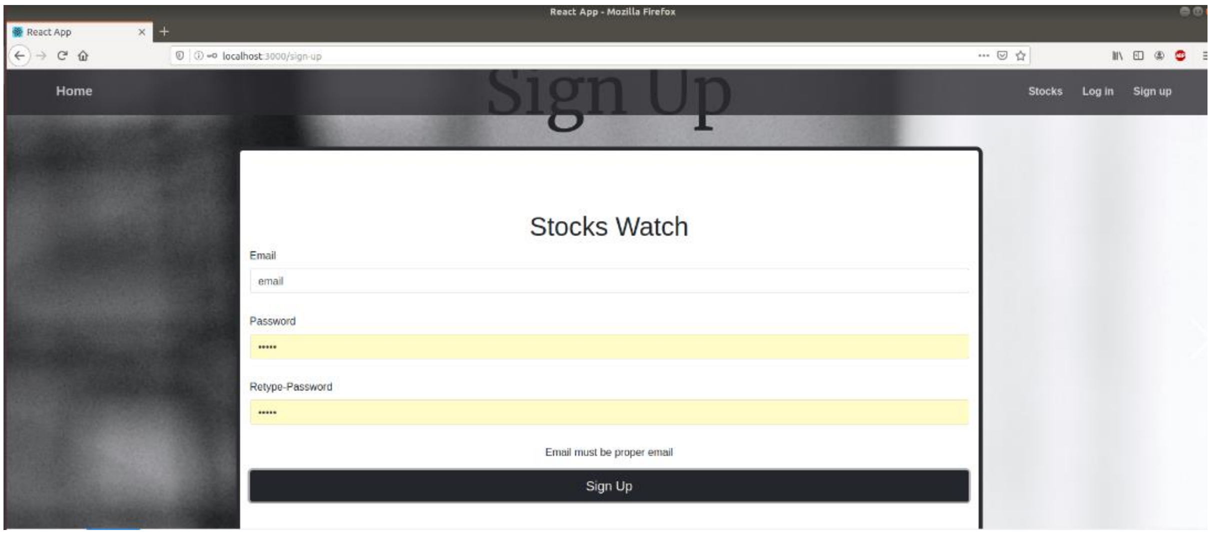
15) Login error no info


React App
localhost:3000/log-in
Home
Log In
Stocks Log in Sign up
Stocks Watch
Email
Email
Password
Password
Login info incomplete
Log In
Sign Up | Forgot Password

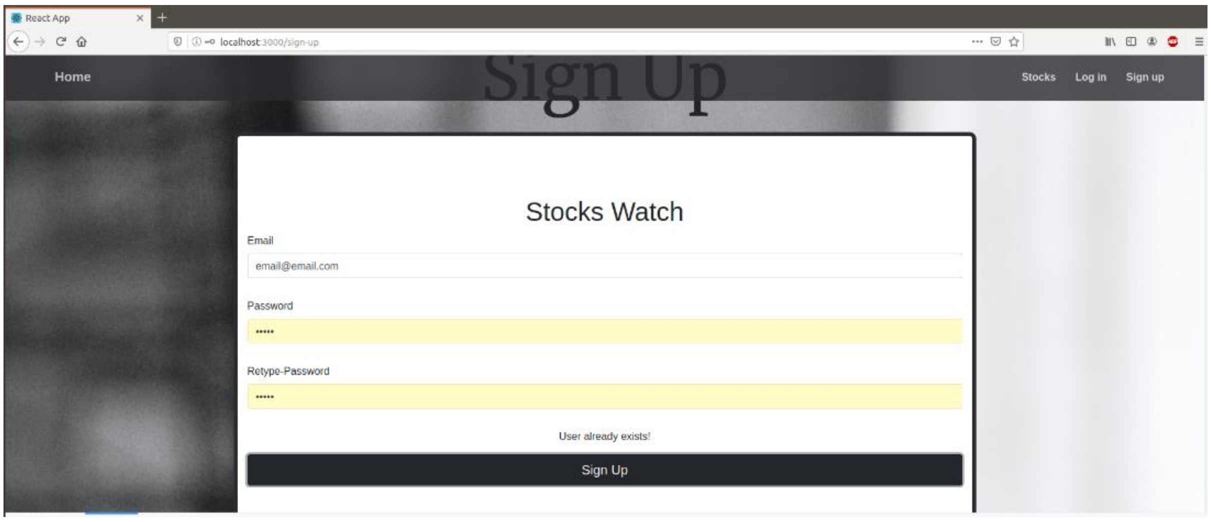
16) Login error incorrect password (field cleared when incorrect)


React App
localhost:3000/log-in
Home
Log In
Stocks Log in Sign up
Stocks Watch
Email
hello
Password
Password
Incorrect password
Log In
Sign Up | Forgot Password

17) Sign up with invalid email


React App - Mozilla Firefox
React App
localhost:3000/sign-up
Home
Sign Up
Stocks Log in Sign up
Stocks Watch
Email
email
Password
•••••
Retype-Password
•••••
Email must be proper email
Sign Up

18) Sign up with in use email



React App

localhost:3000/sign-up

Home

Sign Up

Stocks Log in Sign up

Stocks Watch

Email

email@email.com

Password

•••••

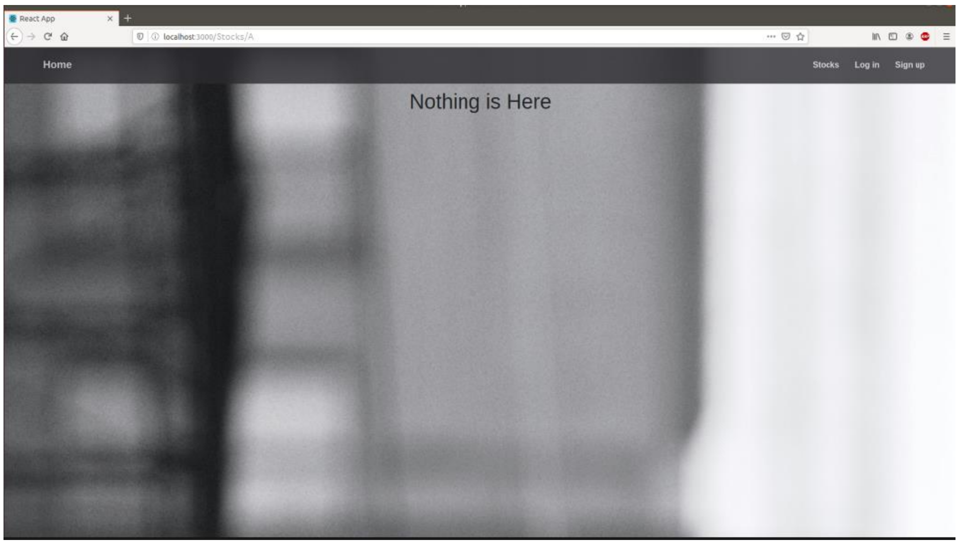
Retype-Password

•••••

User already exists!

Sign Up

19) Error when inputting http address manually



React App

localhost:3000/Stocks/A

Home

Stocks Log in Sign up

Nothing is Here