

2020

# CAB230 Stocks API – Client Side



CAB230

Stocks API – Client Side Application

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4/23/2020

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*This template is adapted from one created for a more elaborate application. The original author spends most of his professional life talking to clients and producing architecture and services reports. You may find this a bit more elaborate than you are used to, but it is there to help you get a better mark*

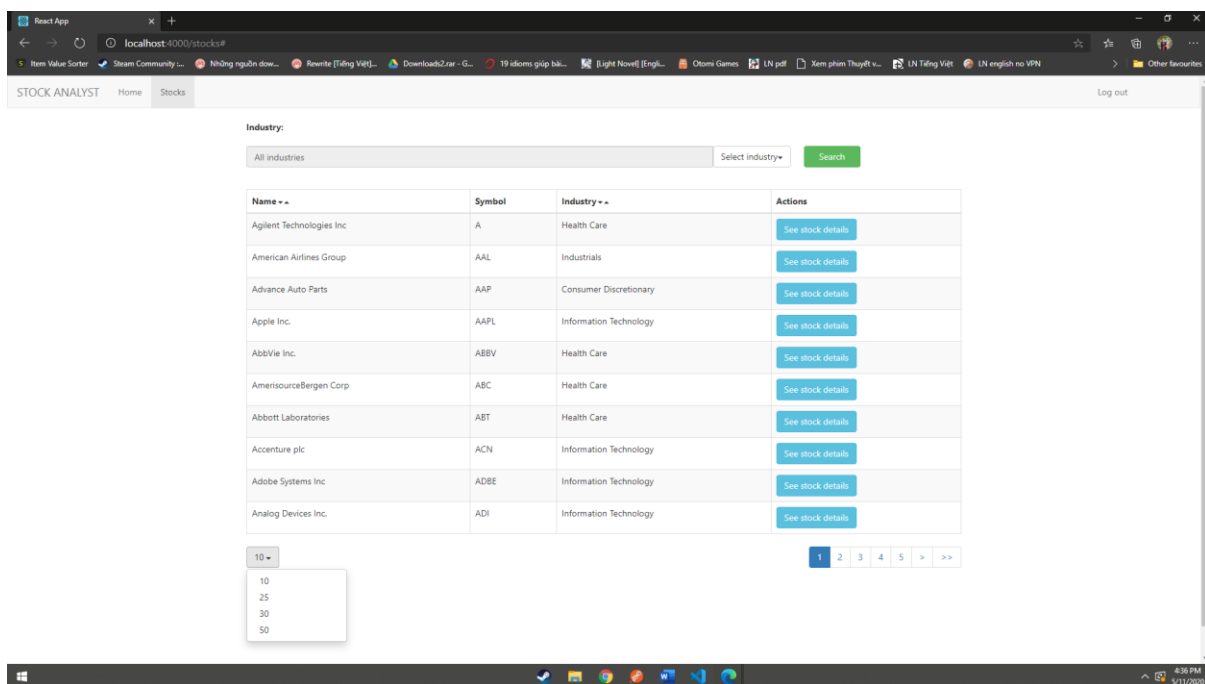
*This report should be around 10 pages or so including screenshots*

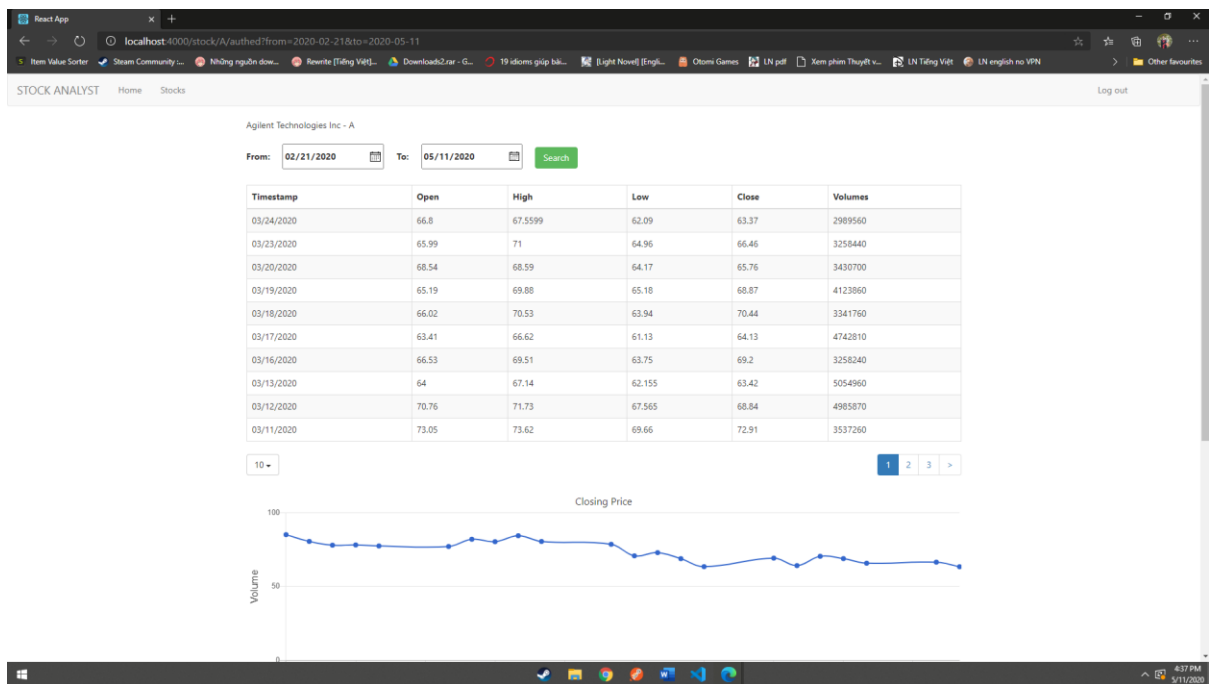
## Introduction

### Purpose & description

Stock Analyst is a web application which can help users improve their trading or investing plan. Users will have an overview about stock market statistics then utilize the information drawn from database to learn how to adapt to market fluctuations, test trading strategies or design an investing plan. The application provides a bunch of features, including statistical data, charting, filtering and automatically generating description.

In the application, I added a small feature that can extract information from data and generate a brief description. Instead of having to look at every single figure, users can have a complete picture about the price history just by reading the description. Moreover, the table displaying data can be customized by different ways. Users can filter the data according to the industries they particularly interest or they can option how many stocks should be displayed in the table. The project utilized the advantages of Bootstrap 3 – the most popular framework for web application. It makes the design work faster and easier. Thanks to React bootstrap table module, it is not difficult to implement pagination, searching tool and row selection into the table. Last but not least, React Router have been used to keep the application UI in sync with the browser's URL.





## Completeness and Limitations

The application can navigate smoothly between pages thanks to React Router module. In addition, it can present table elegantly by implementing React Bootstrap Table. Stock Analyst also supports searching (from partial values or choosing specific industry field) by sending suitable query to the server. The User endpoints and the authenticated Query route were successfully implemented. The React form was utilized to submit and get data from the server. Lastly, the app also offers a chart to display the trend of stock prices and give an overview through the brief description. However, there are still some limitations such as violation occurs when retrieve a large amount of stock price and the design of the app looks quiet simple.

## Use of End Points

</stocks/symbols>

This endpoint returns an array of all stocks.

```
Array(405)
  (0 - 99)
    0: {name: "Agilent Technologies Inc", symbol: "A", industry: "Health Care"}
    1: {name: "American Airlines Group", symbol: "AAL", industry: "Industrials"}
    2: {name: "Advance Auto Parts", symbol: "AAP", industry: "Consumer Discretionary"}
    3: {name: "Apple Inc.", symbol: "AAPL", industry: "Information Technology"}
    4: {name: "ABBVie Inc.", symbol: "ABBV", industry: "Health Care"}
    5: {name: "Abercrombie & Fitch", symbol: "ABF", industry: "Retail"}
    6: {name: "Abbott Laboratories", symbol: "ABT", industry: "Health Care"}
    7: {name: "Accenture plc", symbol: "ACN", industry: "Information Technology"}
    8: {name: "Adobe Systems Inc", symbol: "ADBE", industry: "Information Technology"}
    9: {name: "Aflac Inc.", symbol: "AFL", industry: "Health Care"}
    10: {name: "Archer-Daniels-Midland Co", symbol: "ADM", industry: "Consumer Staples"}
    11: {name: "Automatic Data Processing", symbol: "ADP", industry: "Information Technology"}
    12: {name: "Allstate Data System", symbol: "ADS", industry: "Information Technology"}
    13: {name: "Autodesk Inc", symbol: "ADSK", industry: "Information Technology"}
    14: {name: "Ameren Corp", symbol: "AEE", industry: "Utilities"}
    15: {name: "American Electric Power", symbol: "AEP", industry: "Utilities"}
    16: {name: "AES Corp", symbol: "AES", industry: "Utilities"}
    17: {name: "Aetna Inc", symbol: "AET", industry: "Health Care"}
    18: {name: "Aflac Inc", symbol: "AFL", industry: "Health Care"}
    19: {name: "Allergan Plc", symbol: "AGN", industry: "Health Care"}
    20: {name: "American International Group Inc.", symbol: "AIG", industry: "Financials"}
    21: {name: "Apartment Investment & Management", symbol: "AIV", industry: "Real Estate"}
    22: {name: "Assurant Inc", symbol: "AIZ", industry: "Financials"}
    23: {name: "Arthur J. Gallagher & Co.", symbol: "AJG", industry: "Financials"}
    24: {name: "Akamai Technologies Inc", symbol: "AKAM", industry: "Information Technology"}
    25: {name: "Albemarle Corp", symbol: "ALB", industry: "Materials"}
    26: {name: "Align Technology", symbol: "ALGN", industry: "Health Care"}
    27: {name: "Alaska Air Group Inc", symbol: "ALK", industry: "Industrials"}
    28: {name: "Allstate Corp", symbol: "ALL", industry: "Financials"}
    29: {name: "Allergan", symbol: "ALL", industry: "Health Care"}
    30: {name: "Allison Pharmaceuticals", symbol: "ALN", industry: "Health Care"}
    31: {name: "Applied Materials Inc", symbol: "AMAT", industry: "Information Technology"}
    32: {name: "Advanced Micro Devices Inc", symbol: "AMD", industry: "Information Technology"}
    33: {name: "Amgen Inc", symbol: "AMGN", industry: "Health Care"}
    34: {name: "Affiliated Managers Group Inc", symbol: "AMG", industry: "Financials"}
    35: {name: "Amgen Inc", symbol: "AMGN", industry: "Health Care"}
    36: {name: "Ameriprise Financial", symbol: "AMP", industry: "Financials"}
    37: {name: "American Tower Corp A", symbol: "AMT", industry: "Real Estate"}
    38: {name: "Amazon.com Inc", symbol: "AMZN", industry: "Consumer Discretionary"}
    39: {name: "Anderson", symbol: "ANDV", industry: "Energy"}
```

When users navigate to the Stock List Page or click on button search, the application will fetch the data from sever through the route /stocks/symbols with a suitable parameter then display it in the table

STOCK ANALYST	Home	Stocks	Log out
---------------	------	--------	---------

Industry:			
Health Care	Select industry	Search	

Name ▾ ▴	Symbol	Industry ▾ ▴	Actions
Agilent Technologies Inc	A	Health Care	<a href="#">See stock details</a>
AbbVie Inc.	ABBV	Health Care	<a href="#">See stock details</a>
AmericanSourceBergen Corp	ABC	Health Care	<a href="#">See stock details</a>
Abbott Laboratories	ABT	Health Care	<a href="#">See stock details</a>
Aetna Inc	AET	Health Care	<a href="#">See stock details</a>
Allergan Plc	AGN	Health Care	<a href="#">See stock details</a>
Align Technology	ALGN	Health Care	<a href="#">See stock details</a>
Alexion Pharmaceuticals	ALXN	Health Care	<a href="#">See stock details</a>
Amgen Inc	AMGN	Health Care	<a href="#">See stock details</a>
Anthem Inc.	ANTM	Health Care	<a href="#">See stock details</a>

10 ▾ ▴

1 2 3 4 5 > >>

/stocks/{symbol}

This shows the latest stock price of a company

STOCK ANALYST	Home	Stocks	Register	Log in
---------------	------	--------	----------	--------

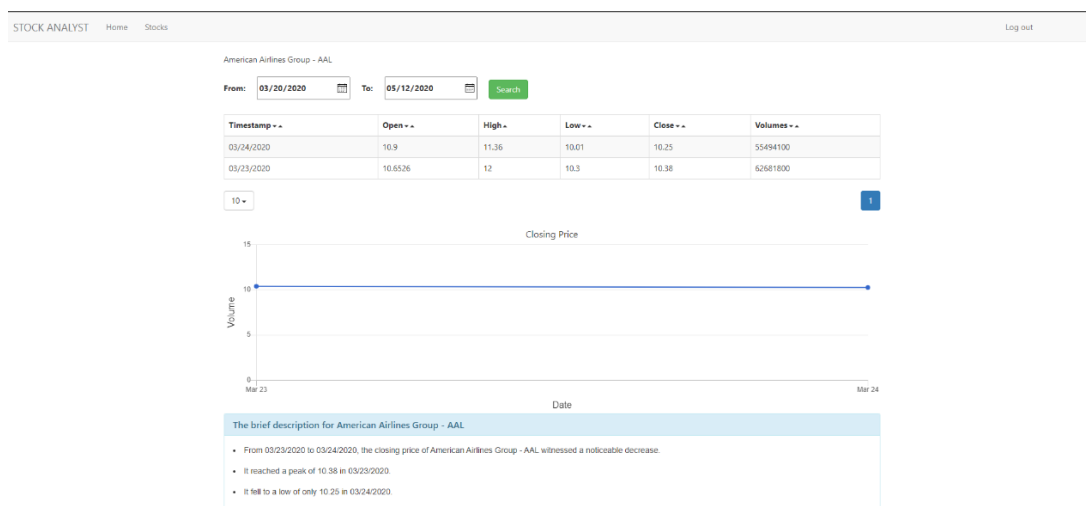
  

Agilent Technologies Inc - A

Timestamp ▾ ▴	Open ▾ ▴	High ▾ ▴	Low ▾ ▴	Close ▾ ▴	Volumes ▾ ▴
03/24/2020	66.8	67.5599	62.09	63.37	2989560

/stocks/authed/{symbol}

After users are authenticated, they can access the stock price history



## </user/register>

If users have not already had an account, they can create one and send account information to the server.

STOCK ANALYST Home Stocks Register Log in

Username:  
abc123456789@gmail.com

Password:  
\*\*\*\*

Re-enter password:  
\*\*\*\*

Back Register

localhost:4000 says  
User created  
OK

## </user/login>

If users have already had an account, the server will validate the account information. If the account is valid, the app will redirect to the home page.

STOCK ANALYST Home Stocks Register Log in

Username:  
abc123456@gmail.com

Password:  
\*\*\*\*

Back Login

Modules used

*React-bootstrap-table-next*

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

<https://react-bootstrap-table.github.io/react-bootstrap-table2/>

*Moment*

Module to display dates and times in JavaScript.

<https://momentjs.com/>

*React-router-dom*

Module to link the URL to the React application.

<https://reacttraining.com/react-router/web/guides/quick-start>

*react-bootstrap-table2-filter*

Module to provide the filter feature for React Bootstrap Table.

<https://www.npmjs.com/package/react-bootstrap-table2-filter>

*react-bootstrap-table2-paginator*

Module to provide the pagination feature for React Bootstrap Table.

<https://www.npmjs.com/package/react-bootstrap-table2-paginator>

*chart.js*

Module to provide fully-featured chart components.

<https://reacttraining.com/react-router/web/guides/quick-start>

*react-chartkick*

Module to provide line chart components.

<https://github.com/ankane/react-chartkick>

*axios*

Module to make http request from node.js.

<https://www.npmjs.com/package/axios>

*bootstrap3*

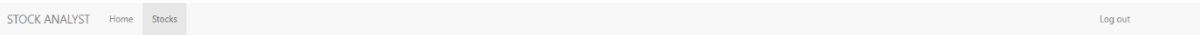
Module to facilitate the design development of application

<https://getbootstrap.com/docs/3.3/>

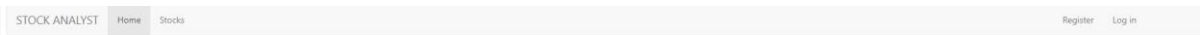
## Application Design

### Navigation and Layout

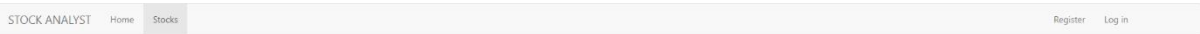
In the first step of the design process, I determined the purpose of the web application and what features and components the app requires. In the next stage, I started digging into the app navigation and found out how components are linked together. Next, I began creating components for the individual pages. There are two major components on a single page, which are Menu and Page Content. Since every page implements the same Menu, therefore, I focused on coding Menu components before creating Page Content. The idea of Menu component is a navigation bar which consists of the name of the app and the links to all other pages.



When user access the web app, the first page they will see is the Home Page which provides an introduction about the application and a Menu that links to another page.



From Home Page, users can navigate to Stocks Page by clicking Stocks link on the Menu or using button Get Started located in the center of Home Page.



Industry:

Search  Select industry

Name	Symbol	Industry	Actions
Agilent Technologies Inc	A	Health Care	<a href="#">See stock details</a>
American Airlines Group	AAL	Industrials	<a href="#">See stock details</a>
Advance Auto Parts	AAP	Consumer Discretionary	<a href="#">See stock details</a>
Apple Inc.	AAPL	Information Technology	<a href="#">See stock details</a>
AbbVie Inc.	ABBV	Health Care	<a href="#">See stock details</a>
AmerisourceBergen Corp	ABC	Health Care	<a href="#">See stock details</a>
Abbott Laboratories	ABT	Health Care	<a href="#">See stock details</a>
Accenture plc	ACN	Information Technology	<a href="#">See stock details</a>
Adobe Systems Inc	ADBE	Information Technology	<a href="#">See stock details</a>
Analog Devices Inc.	ADI	Information Technology	<a href="#">See stock details</a>

10



The “See stock details” button can navigate users to the Stock Detail Page of the company they are looking for.

STOCK ANALYST   Home   Stocks						Register   Log in
American Airlines Group - AAL						
Timestamp	Open	High	Low	Close	Volumes	
03/24/2020	10.9	11.36	10.01	10.25	55494100	

If users have not already had an account, they can go to Register Page by clicking the Register link which is placed in the right of the navigation bar.

STOCK ANALYST   Home   Stocks						Register   Log in
Username:						
<input type="text" value="abc123456@gmail.com"/>						
Password:						
<input type="password" value="****"/>						
Re-enter password:						
<input type="password" value="****"/>						
<input type="button" value="Back"/>						<input type="button" value="Register"/>

---

If users have already had an account, they can log in by going to Log In Page.

STOCK ANALYST

Home

Stocks

Register

Log in

Username:

abc123456@gmail.com

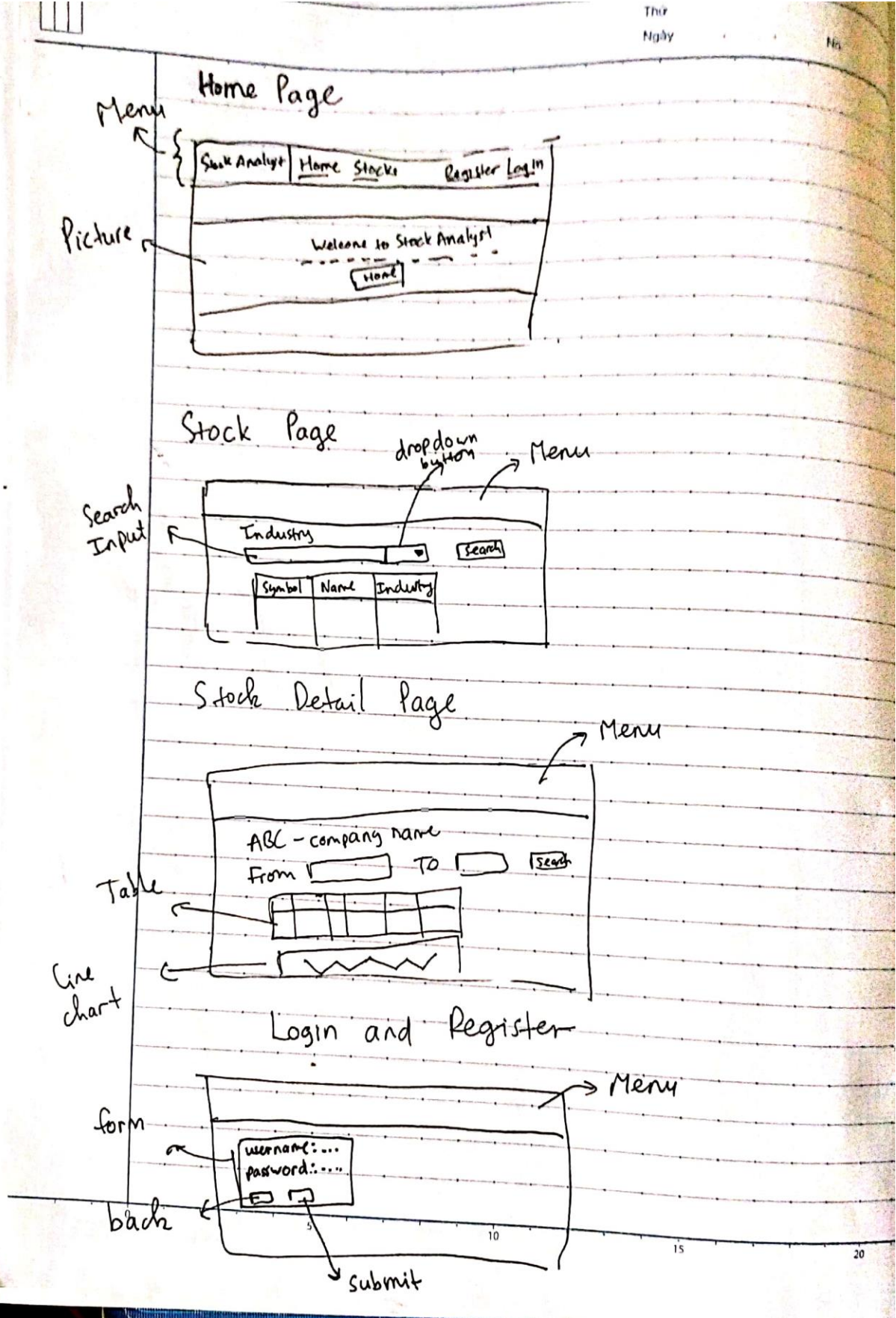
Password:

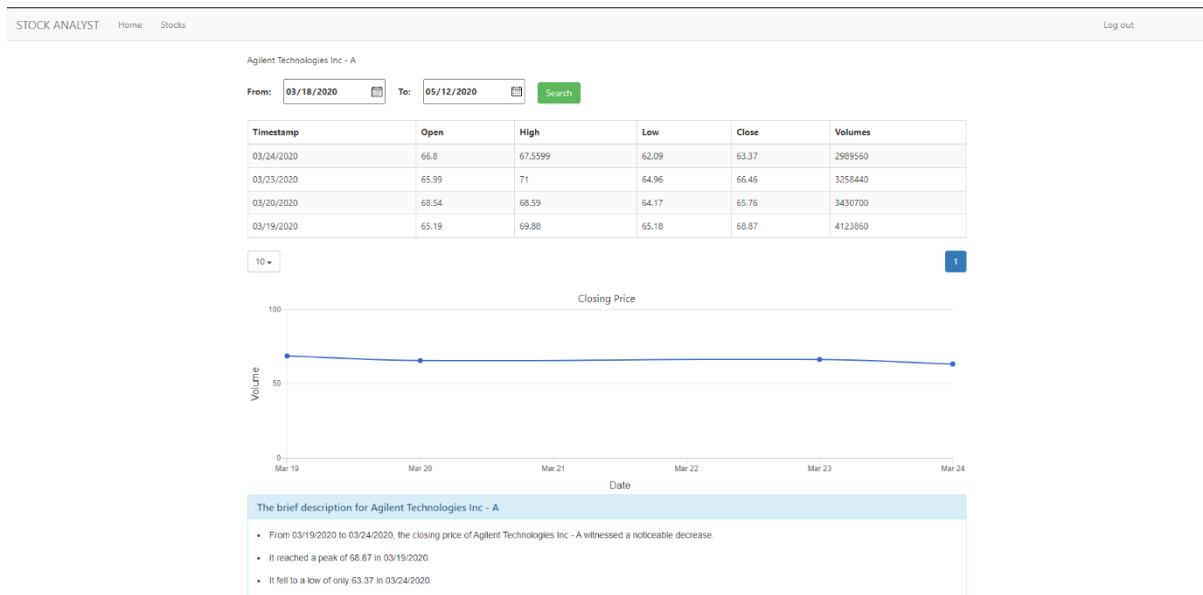
\*\*\*\*

Back

Login

From then on, users can access full features of the web app when accessing Stock Detail Page: stock price history, chart presentation and automatically generating description. Some of my sketches:





The application layout is quiet simple and really simple to use. It proves no challenge for users to understand how they can be navigated between pages. However, there are still some improvements that can be implemented such as doing effect when moving to a new page or adding a progress bar when fetching database from API.

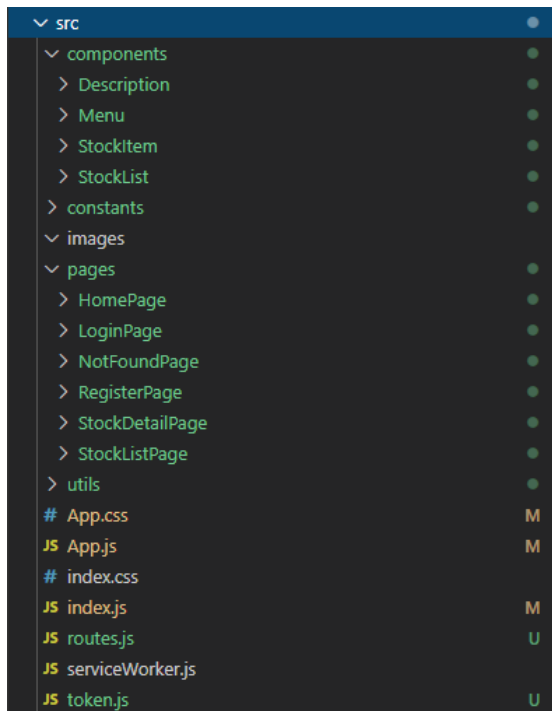
## Technical Description

### Architecture

Here is my code organization

public	4/27/2020 12:20 PM	File folder	
src	5/12/2020 10:12 AM	File folder	
.gitignore	10/26/1985 6:15 PM	Text Document	1 KB
package	5/6/2020 12:22 PM	JSON File	2 KB
package-lock	5/6/2020 12:22 PM	JSON File	612 KB
README	10/26/1985 6:15 PM	Markdown Source...	3 KB

The responsibilities have been split as below



The “components” folder contains the components of the application. Then they can be reusable easily just by importing to any pages. The “constants” folder contains some variables that are not changed in the app. The “images” folder contains the images for designing layout. The “pages” folder contains the designs of every single page. The “utils” folder contains some functions to help the app work properly such as call API or validate input etc.

## Test plan

Task	Expected Outcome	Result	Screenshot/s (Appendix)
User register successful	Display result	PASS	01
User register fail	Display error	PASS	02
User login fail	Display error	PASS	03
Search for all stocks	Table with all stocks displayed	PASS	04
Search stocks by industry sector	Table with particular stocks	PASS	05
Table pagination	Divide table into pages	PASS	06
Sort table by columns	Sort table by alphabetic order	PASS	07
Not allow guest user to search by date	Only display the latest stock price	PASS	08
Search price history by date	Table display stock price	PASS	09
Charts for stock price	Line chart displayed	PASS	10
Handle no date range error	No data displayed	PASS	11

Difficulties / Exclusions / unresolved & persistent errors /

There is no major bug appears. However, there is a verbose in Stock Detail Page and violation occurs when loading data:

```
[Violation] Forced reflow while executing JavaScript took 42ms
```

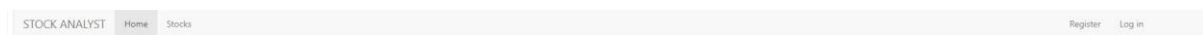
## Extensions

For the future improvements, some effect can be implemented to make the app look more elegant.

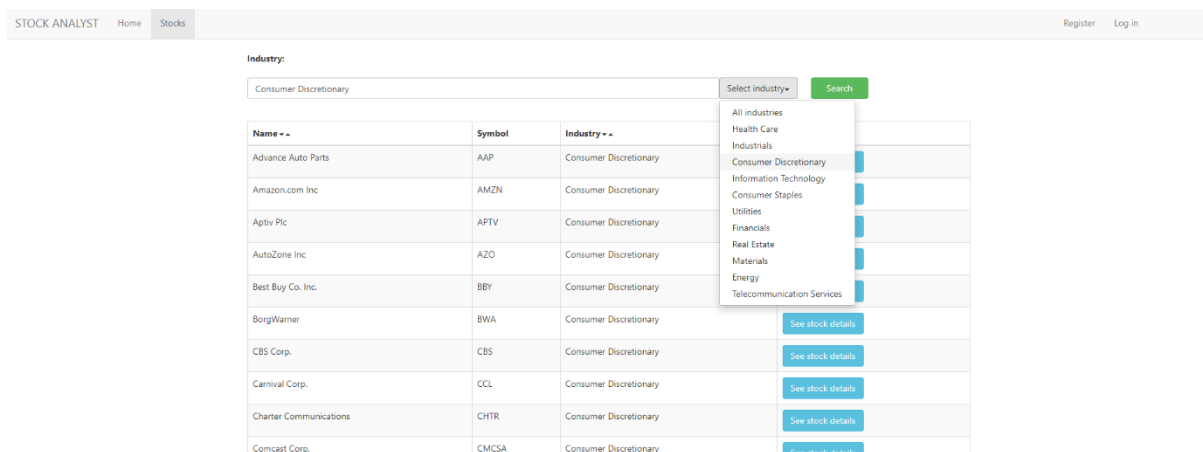
## User guide

The main functions of the app are Register, Login, Search for stocks and Search for stock price.

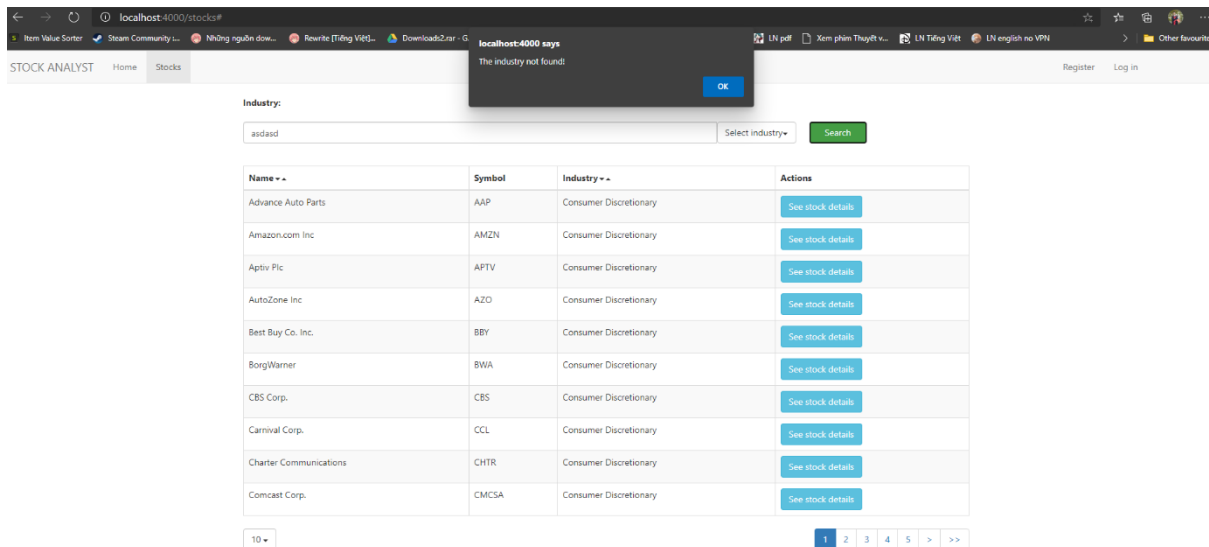
At a fresh visit, the homepage will be displayed. Then users can navigate to Stock Page by clicking the link on navigation bar or “Get Started” button.



To search and display a particular industry sector, users can type in the search box what industry they are interested in or choose an industry from dropdown button.



If no industry sector found, an error is displayed.



User can also go to different table page or specify how many rows should be displayed in a page of the table. To sort the table by a column, click the header of that column.

To get stock price data of a particular stock, click the “See stock details”. It will redirect to Stock Detail Page.

STOCK ANALYST Home Stocks Register Log in					
American Airlines Group - AAL					
Timestamp	Open	High	Low	Close	Volumes
03/24/2020	10.9	11.35	10.01	10.25	55494100

Guest users only can access to the latest price of the stock. To get price history, user have to login. Click the Login button at the top right of the page.

STOCK ANALYST   Home   Stocks   Register   Log in

Username:

Password:

Back

Login

The errors will be displayed if users input incorrect credentials

localhost:4000/login

Item Value Sorter   Steam Commun   ar - G...   Other favourites

STOCK ANALYST   Home   Stocks   Register   Log in

localhost:4000 says

Bad account

OK

Username:

abc123456@gmail.com

Password:

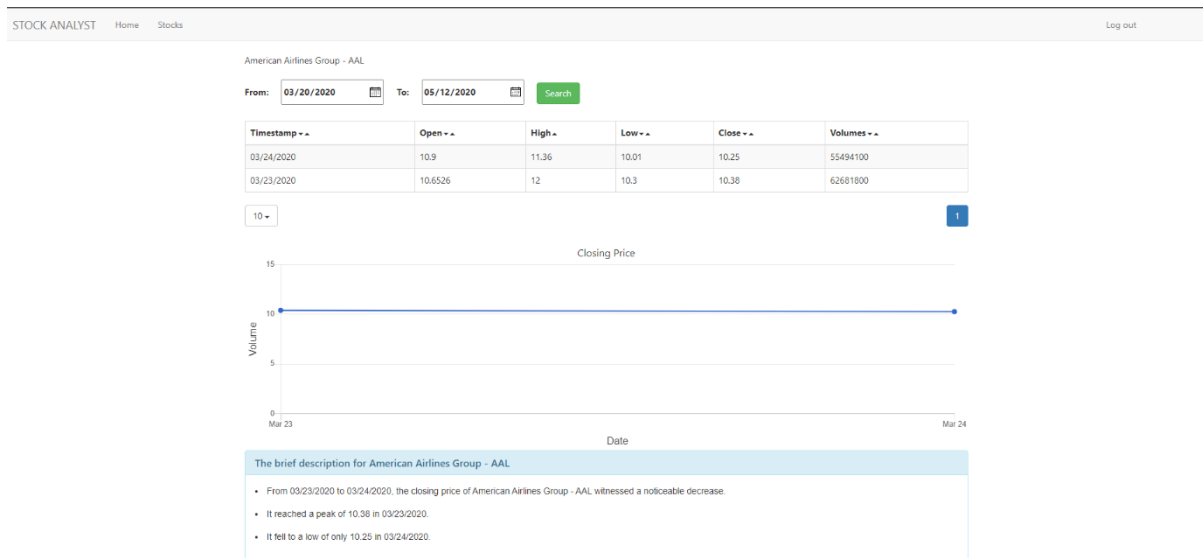
.....

Back

Login

After users logged in, they will redirect to Stock Page. Users must specify the inputs to get the historical data and the line chart. To sort the table by a column, click the header of that column.





The login session will be expired after 24 hours. The app will check the expiry date every 10 minutes and log out if the session is expired.

## Appendix 01

localhost:4000/register

STOCK ANALYST Home Stocks Register Log in

Username:

abc123456789@gmail.com

Password:

\*\*\*\*

Re-enter password:

\*\*\*\*

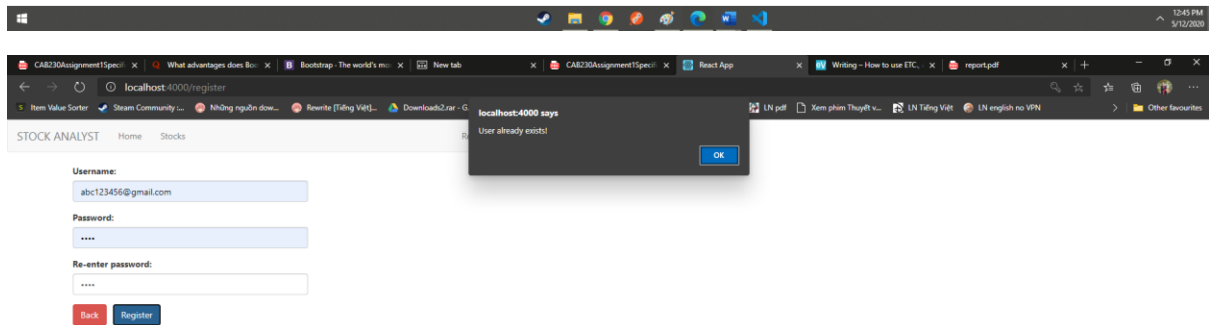
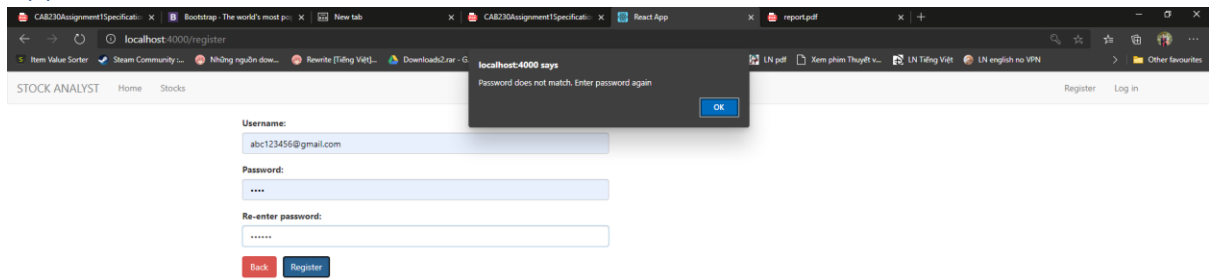
Back Register

localhost:4000 says

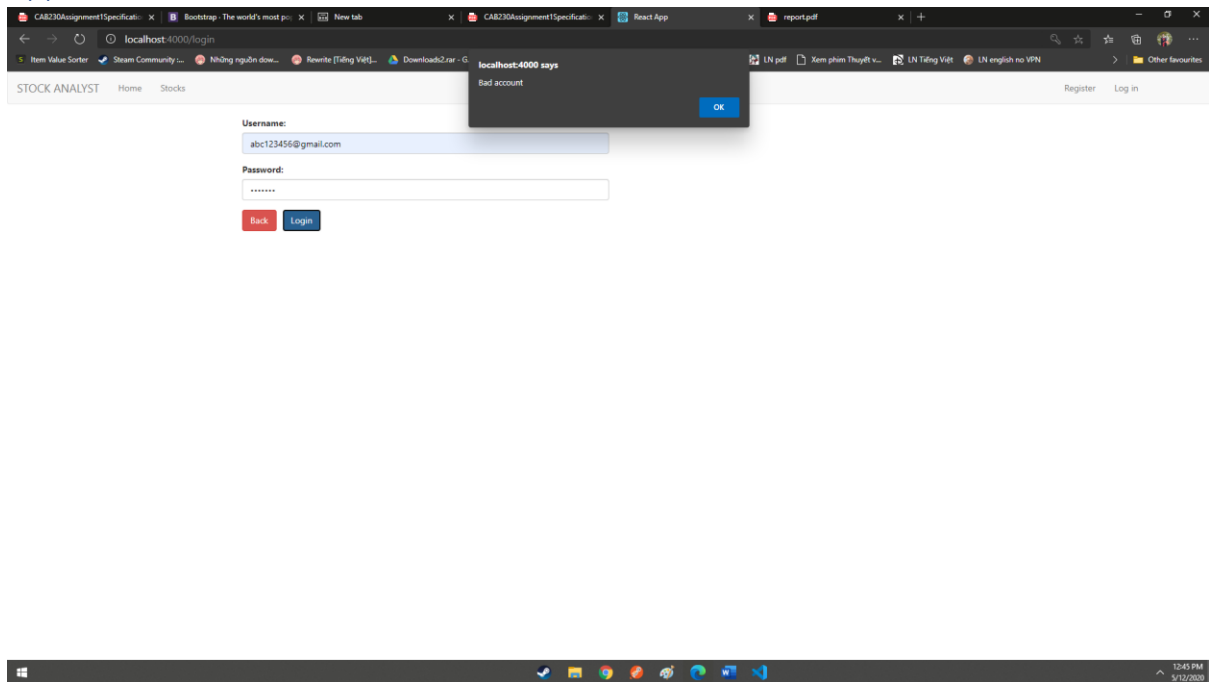
User created

OK

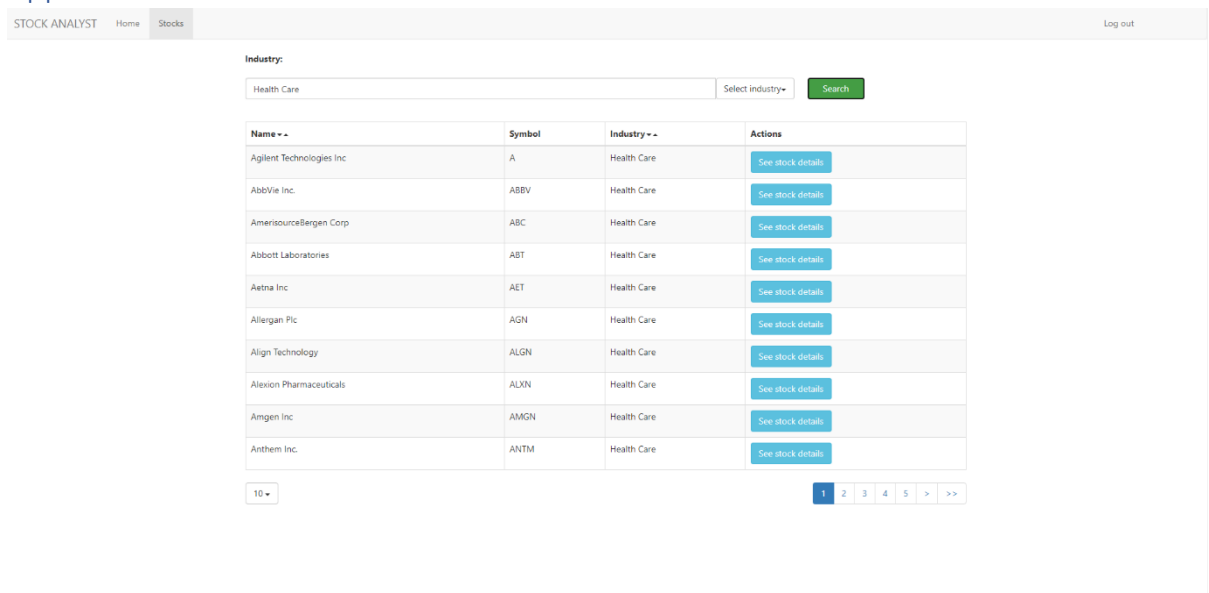
## Appendix 02



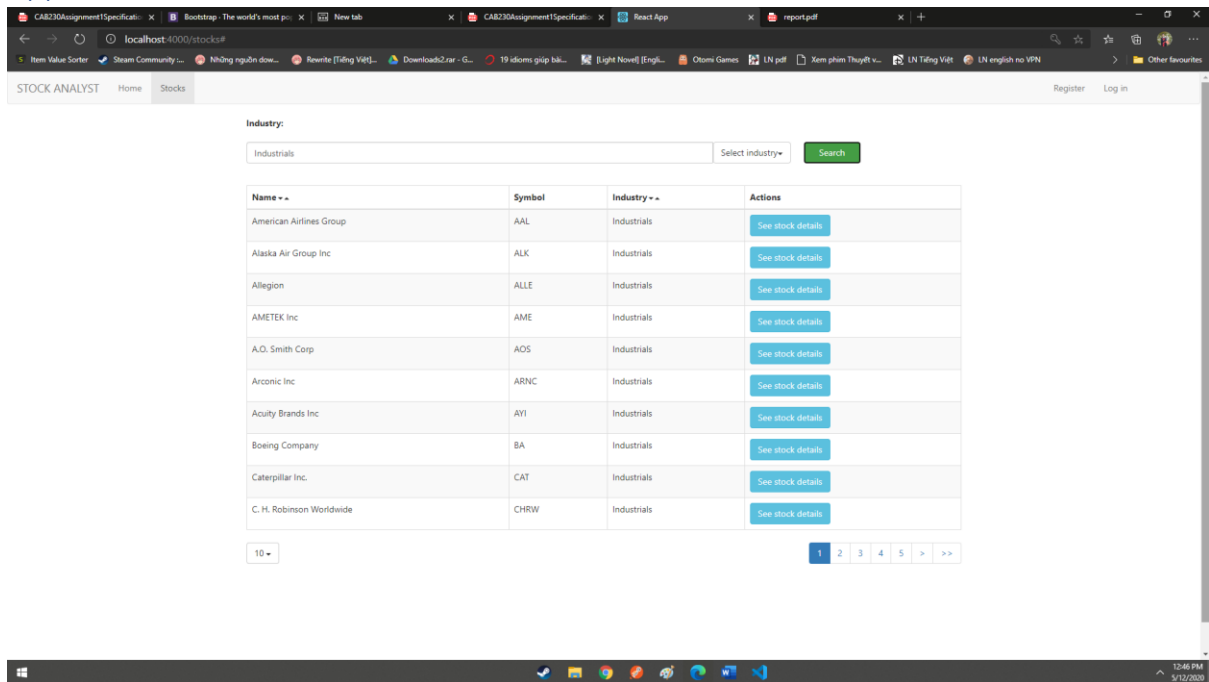
## Appendix 03



## Appendix 04



## Appendix 05



## Appendix 06

Arconic Inc	ARNC	Industrials	<a href="#">See stock details</a>
Acuity Brands Inc	AYI	Industrials	<a href="#">See stock details</a>
Boeing Company	BA	Industrials	<a href="#">See stock details</a>
Caterpillar Inc.	CAT	Industrials	<a href="#">See stock details</a>
C. H. Robinson Worldwide	CHRW	Industrials	<a href="#">See stock details</a>

10

1 2 3 4 5 > >>

## Appendix 07

Name	Symbol	Industry	Actions
3M Company	MMM	Industrials	<a href="#">See stock details</a>
A.O. Smith Corp	AOS	Industrials	<a href="#">See stock details</a>
Abbott Laboratories	ABT	Health Care	<a href="#">See stock details</a>
AbbVie Inc.	ABBV	Health Care	<a href="#">See stock details</a>
Accenture plc	ACN	Information Technology	<a href="#">See stock details</a>
Activision Blizzard	ATVI	Information Technology	<a href="#">See stock details</a>
Acuity Brands Inc	AYI	Industrials	<a href="#">See stock details</a>
Adobe Systems Inc	ADBE	Information Technology	<a href="#">See stock details</a>
Advance Auto Parts	AAP	Consumer Discretionary	<a href="#">See stock details</a>
Advanced Micro Devices Inc	AMD	Information Technology	<a href="#">See stock details</a>

# Appendix 08

American Airlines Group - AAL

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

# Appendix 09

Agilent Technologies Inc - A

From: 03/18/2020 To: 05/12/2020 Search

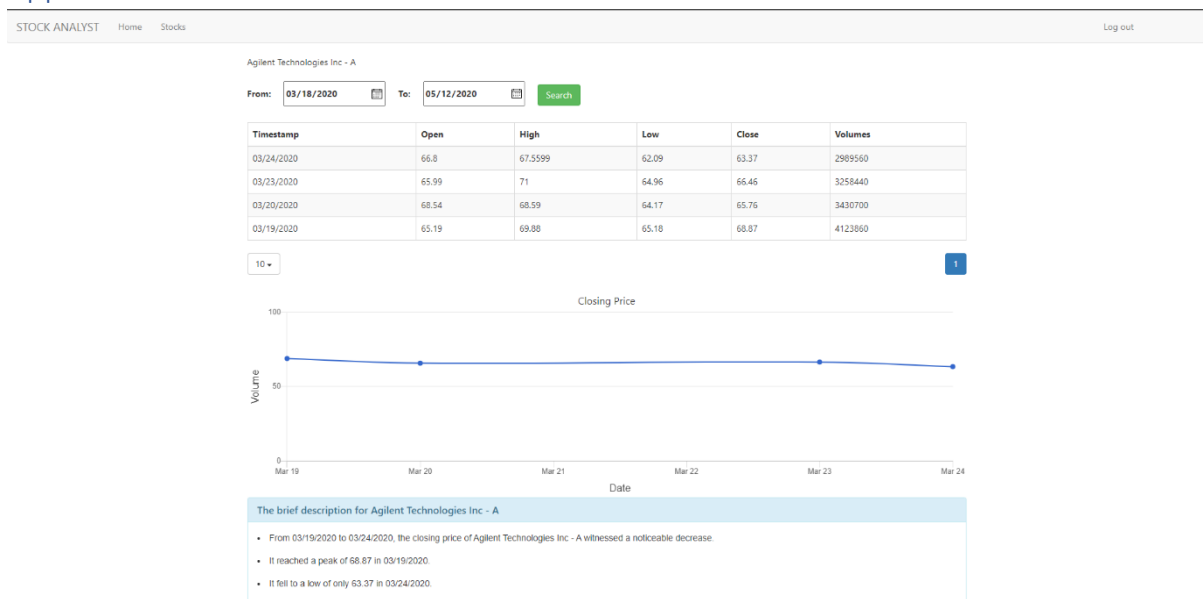
Timestamp	Open	High	Low	Close	Volumes
03/24/2020	66.8	67.5599	62.09	63.37	2989550
03/23/2020	65.99	71	64.96	66.46	3258440
03/20/2020	68.54	68.59	64.17	65.76	3430700
03/19/2020	65.19	69.88	65.18	68.87	4123860



The brief description for Agilent Technologies Inc - A

- From 03/19/2020 to 03/24/2020, the closing price of Agilent Technologies Inc - A witnessed a noticeable decrease.
- It reached a peak of 68.87 in 03/19/2020.
- It fell to a low of only 63.37 in 03/24/2020.

## Appendix 10



## Appendix 11

