Hampshire Internship Capstone Project Report

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Indiana University – Purdue University Indianapolis

CSCI 496: Internship Capstone Project

8-6-2021

Abstract

To fulfill the requirements of CSCI 496, Jason Hampshire participated in the Infosys InStep internship program in the Summer semester of 2021. Considering the COVID-19 pandemic was still underway, the internship was conducted remotely. The internship spanned 8 weeks, beginning May 10th and ending July 1st. Over the course of these 8 weeks, Hampshire was to work as a part of a team of two people on an assigned project referred to as Share Market Prediction (SMP). This was not the project that Hampshire was initially assigned to; The original, Health Monitoring application, being cancelled due to the purely remote nature of the internship. The goal of the SMP project was to create a web-based application that would interface with the stock market and make predictions based on a web application programming interface (API). Throughout the course of the internship, Hampshire would be guided by his Infosys mentor on the process of how to develop such application, including the necessary company documentation that would be necessary. The scope of the project was determined to be far larger than two interns could finish within an 8-week timeframe and project was scaled back to not require full completion; only primary features would need to be implemented. At the end of the internship, the work that Hampshire completed with his teammate intern was determined to meet and exceed expectations. (*Various screen captures of the development process as well as the evaluation letter(s) from industrial supervisor can be found in the Appendix section.)*

Introduction

Background

Since the beginning of the modern internet, a variety of both personal and commercial software tools have been created to provide traders with information about current and potential investments. Many businesses have created proprietary internal applications to serve this propose, using company information and assets to make them specialized. The SMP project was conceptualized as an application that could be used as a basic demonstration for such an application.

Hampshire worked with a partner intern on the SMP project, a student from the University of Indianapolis [redacted]. Initially, Hampshire was assigned pre-internship start to a separate project that was to focus on IOT and microcontrollers, but since the internship was determined to have no in-person elements what-so-ever, his project was dissolved and was assigned to work jointly [redacted]. This proved to be beneficial, as the size of the project was initially thought to be smaller than in execution. Both interns worked under a mentor, a Senior Software Architect named Kumar Vikas Singh.

Hampshire also worked closely with his internship coordinator Nirupa Jayakrishnan as well. Hampshire was to contact Nirupa whenever any questions regarding the internship that were not project specific.

Project Details

Infosys is a worldwide company with over 200,000 employees. With a corporation this large, Infosys is able to provide a number of services, a primary one being software consulting or contract work. The purpose of the SMP project, as described in [redacted]

Technical Details

Preliminary Specifications

The SMP project was conceptualized with a list of features in mind; however, due to the project being scaled back, many of these features did not have time to be addressed. The full list of requested features includes the following:

- Ability to sign up, login, and save a profile
- Authentication and authorization logic
- Ability to favorite stocks
- View related stock information for each stock
- View dynamic charts for each stock
- Ability to set custom stock formulae
- Notification system based on stock field value
- SQL database for user and profile information
- Unit testing

Many of these features needed to be scaled back and by the end of the internship, the following features were implemented or partially implemented:

- Ability to sign up, login, and save a profile
- Authentication and authorization logic
- Ability to favorite stocks
- Simple chart for stocks implementation
- SQL database for user and profile information

The notification system and custom field specifications had to be completely removed and the stock lookup feature was not able to be fully implemented.

The web-application used an external API to interface with the stock market. With mentor guidance, an API [redacted] This API made is possible to pull real-time data from the stock market to be used by the application.

Implemented Pages and Features

At the end of the internship, Hampshire and his partner were able to implement a number of features. These features were based in various page files, but the following were non-page features:

- [redacted]
- Loading Wheel:

  To make loading times seem meaningful, a loading animation was created. When any page in the application was loaded or reloaded, an animation would play until the page was able to finish behind the scenes processes.
- Header and Footer:

  To make the various pages feel like they fit together, a universally shared header and footer were

implemented. These inserts added titles, company information, a background image, and logout/login button.

- [redacted] API functions:

  To better allow for further development, a variety of API call PHP function pages were added. Over 20 function pages were implemented.

- [redacted]

The following pages were implemented as features:

- Registration Page:

  This page had fillable fields and was used to create a new user. When a register button was clicked, the page would authenticate the entered information and, if valid, create a user in the user database table. [redacted] When all verification was completed, an email was sent to the entered email using a PHP package [redacted]

- Login Page:

  A page that had two fillable fields, one for email or username, one for password. When both fields were filled and entered, [redacted] page to redirect to the index page.

- Index Page:

  The index page acted as a shell for other PHP pages to be loaded into. [redacted]

- Favorites Subpage:

  This page was loaded as an insert into the index page. This section would display the top 5 favorites for the specific user and allow for stocks to be added and removed from the favorites table with a stock symbol. If the symbol was not valid, the insert or delete would fail. When a favorite stock was

clicked on, a graph would be displayed using a JavaScript package called Plotly. The data for the graph was generated by [redacted]

- Search Subpage:

  This page was loaded as an insert to the index page. This subpage had a search bar that would allow for any stock to be looked up with their corresponding symbol. If the symbol was not valid, the search would return an error message. If successful, an API call would be made [redacted] Plotly graph would be shown.

- Account Subpage:

  This page was loaded as an insert to the index page. All this subpage would show is the logged in user's account information, showing their First Name, Last Name, Email, User ID, and Username. Account information editing was and implemented.

Results

Project Deliverables

As a part of the project, a variety of deliverables were expected:

- Requirements Document

  A document that reviewed the SMP project. This served as a initial perspective of the requirements of the project as a whole.

- Project Plan

  Submission of a plan that outlined the processes that were to be completed on a week-by-week basis to serve as a timeline for the internship.

- Weekly Mentor Review

  A weekly meeting with the project mentor, Kumar, to discuss week-by-week roadblocks and progress. The mentor was to aid with the project if needed during this time.

- Share Market Prediction Web Application

  The completed SMP project that fulfilled the project requirements to the extent that was possible with the time given

- Midterm Progress Report Presentation

  A presentation given by Hampshire and his teammate on the overall progress of the project. Necessary topics included sequence diagram, web environment status, issues/roadblocks, and plan for the rest of the internship.

- Final Project Report Presentation

  A presentation given individually by the teammates to outline their contributions to the project, as well as a technical demo to show application functionality. This presentation served as an evaluation of the intern's performance over the course of the internship.

Analysis

The scope of the project at the beginning of the internship entailed far more work than what was possible in 8 weeks. The reduction in project scope relieved a fair bit of stress, as the internship had very strict daily hour totals, only allowing for 7 hours of work a day. While the final delivered project was not as robust as initially intended, the final product was able to be functional. No proper unit testing was able to be conducted, and further work will need to be done to finish the web-application.

The SMP project provided intern Hampshire with the ability to step out of his comfort zone, having never worked with a web API before. Working on an actual company project also was a great learning activity on creating sufficient documentation for future development or maintenance. While the project was a great learning activity, spending the extra time to learn about said technology slows the development process significantly. In this case, this resulted in a necessary scale back and if intern Hampshire was more experienced with web development, the original list of features could have possibly been implemented.

Conclusion

Future Work

The SMP web-application is far from being a finished project, so Hampshire uploaded the entire project to the Infosys InStep GitHub where the project will be handed to a new team to work on. Future development was expected from near the 4th week of the internship on, so special attention was given to commenting the program pages in a standardized format that will be easily understood.

Final Remarks

While working remotely on a group project introduced extra difficulties in terms of communication, the remote Infosys InStep internship exposed Hampshire to a variety of techniques and practices that will prove to be useful as remote work has become much more popular in the wake of COVID-19. While the SMP project did not have the stress of an external client, working on a demo product allowed for much more creative freedom; something that can be difficult to find in contract work.

Appendix

Internship Certificate of Appreciation

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Certificate of Appreciation

Presented to

Jason C Hampshire

In recognition of your valuable contribution as an Intern in the **InStep Global Internship Program 2021-2022**

Pravin Rao U. B.
Chief Operating Officer

Salil S. Parekh
Chief Executive Officer and Managing Director

Internship Completion Letter

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July 01, 2021

To Whom It May Concern

This is to certify that Jason C Hampshire EMP ID 530433 a student of Indiana University-Purdue University Indianapolis has interned for a period of 8 weeks from May 10, 2021 to July 01, 2021 with ENCAS at Infosys Limited as part of InStep, Infosys' Global Internship Program.

As part of his project, he worked on the Share Market Prediction web application.

We wish Jason C Hampshire the very best in all his future endeavors.

Nirupa Jayakrishnan

Warm Regards,
Nirupa Jayakrishnan
Global Academic Relations
Infosys Ltd.
Bangalore, India

Jason Hampshire

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Internship Completion Form

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INTERNSHIP COMPLETION FORM

This is to certify that Jason C Hampshire Employee ID 530433 has successfully completed the InStep Global Internship Program ("Internship") at Infosys Limited Share Market Prediction web application under the guidance of Kumar Vikas Singh, Senior Technology Architect ENCAS. The Duration of this Project was from May 10, 2021 to July 01, 2021. The Intern has acknowledged that the purpose of his Internship with Infosys Limited has been fulfilled.

Nirupa Jayakrishnan
For Infosys Limited.
Nirupa Jayakrishnan
Internship Coordinator
Instep Global Internship Program, Bangalore
Place – Bangalore, India
Date – July 01, 2021

I have read, understood and agreed to the contents set forth in this INTERNSHIP COMPLETION FORM.

Jason Hampshire
Jason C Hampshire
Place – Indianapolis, USA
Date – July 01, 2021

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askus@infosys.com
www.infosys.com

Project Plan:

Database Schema:

Copyrights:

Free assets

Website asset base by templated.co copyright: https://themewagon.com/license/

Other website assets through W3 Schools: https://www.w3schools.com/about/about_copyright.asp

DataTables copyright: https://datatables.net/license/mit

Images: https://pixabay.com/service/license/

Paid assets

[redacted]

Infosys GitHub Contributions:

Login.php Screen Capture

ENTER USERNAME/EMAIL AND PASSWORD TO LOGIN

Username/Email*

user123

Password*

password123

LOGIN

*Required Field

Register

Account Creation Successful Screen Capture

ACCOUNT SUCCESSFULLY CREATED

THE FOLLOWING REGISTRATION INFORMATION HAS BEEN SUBMITTED

Username: jchampsh

Password: IUPUI

First name: John

Last name: Doe

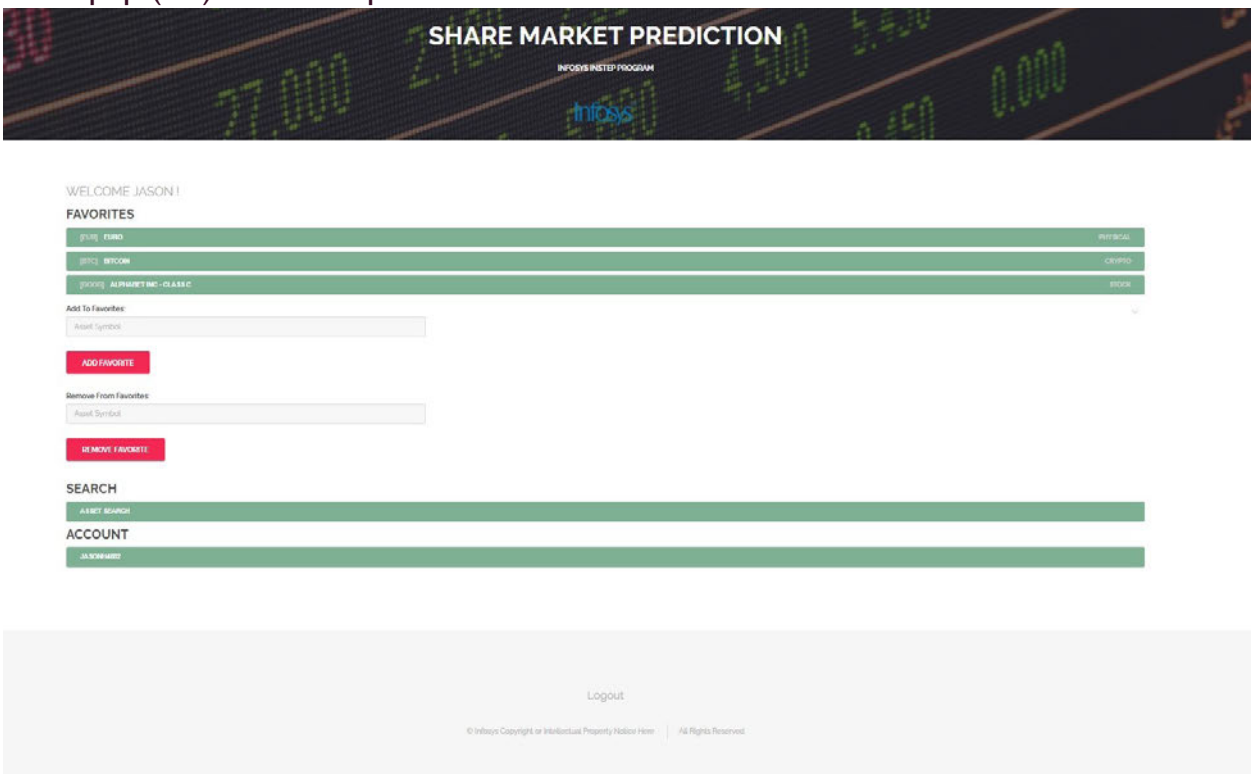
Email: jchampsh@iu.edu

Please check your email to verify and login to your account

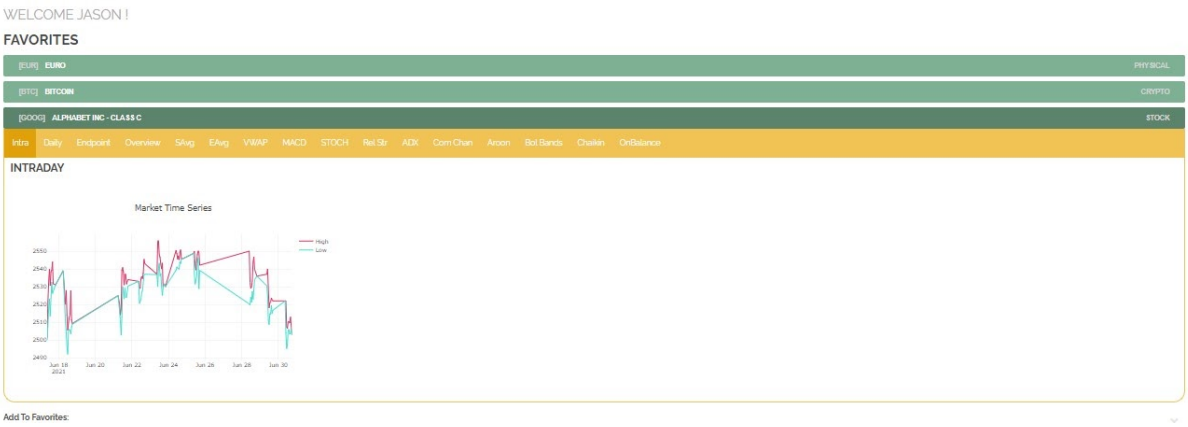
REGISTER ANOTHER PERSON

[redacted]

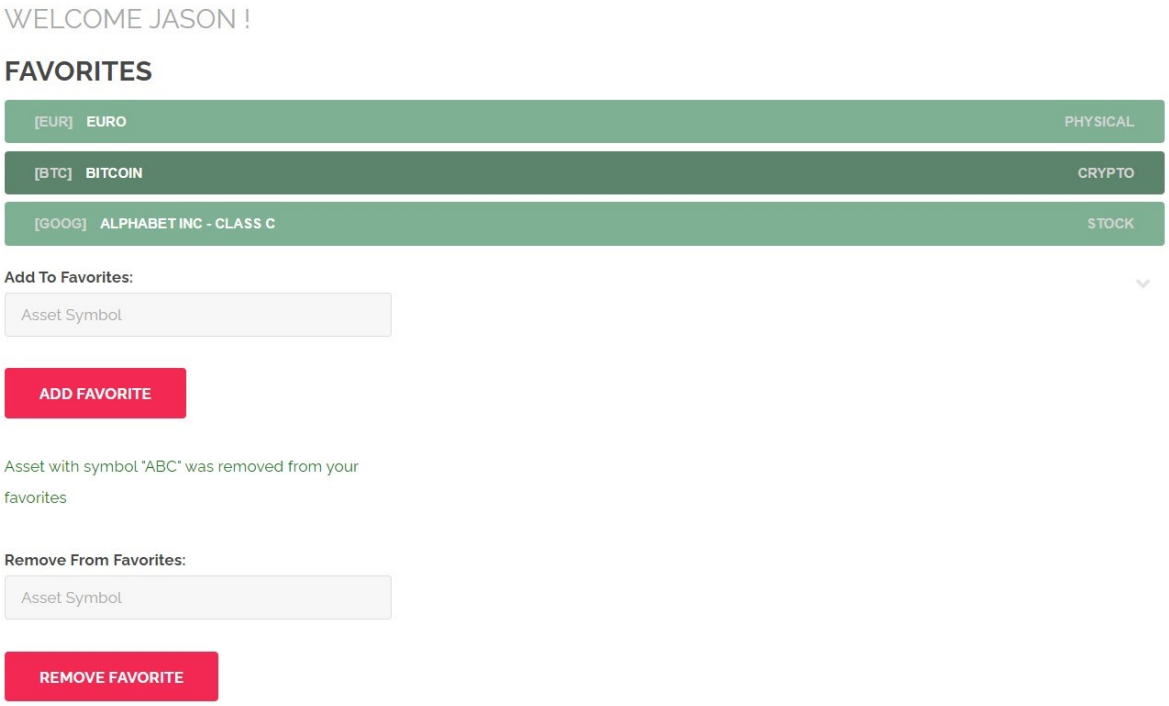
Index.php (full) Screen Capture:



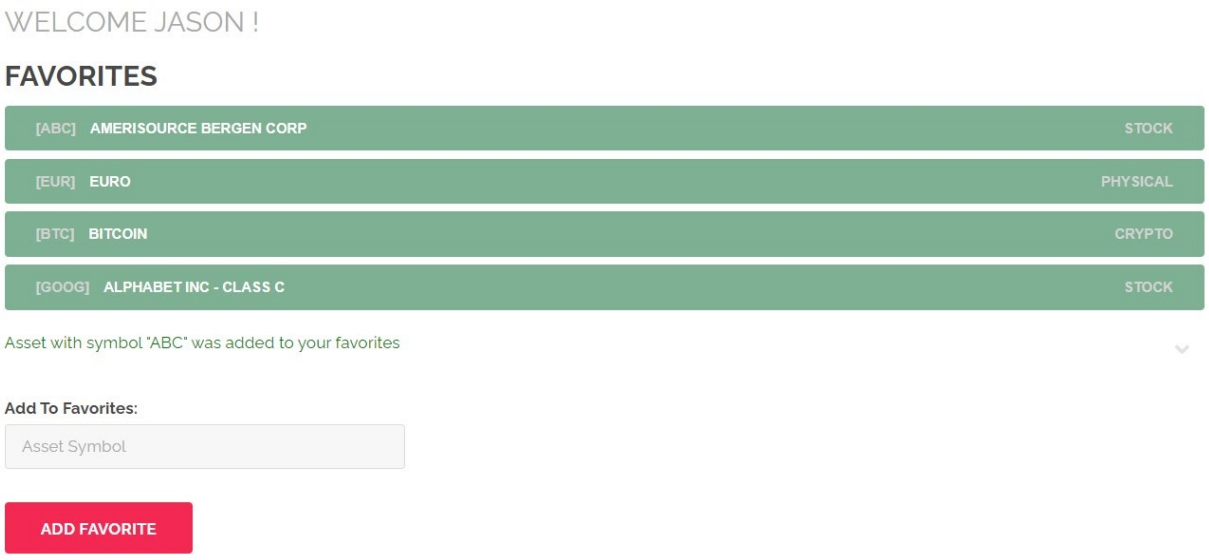
Favorite Simple Plotly Screen Capture:



Favorite Remove Screen Capture:

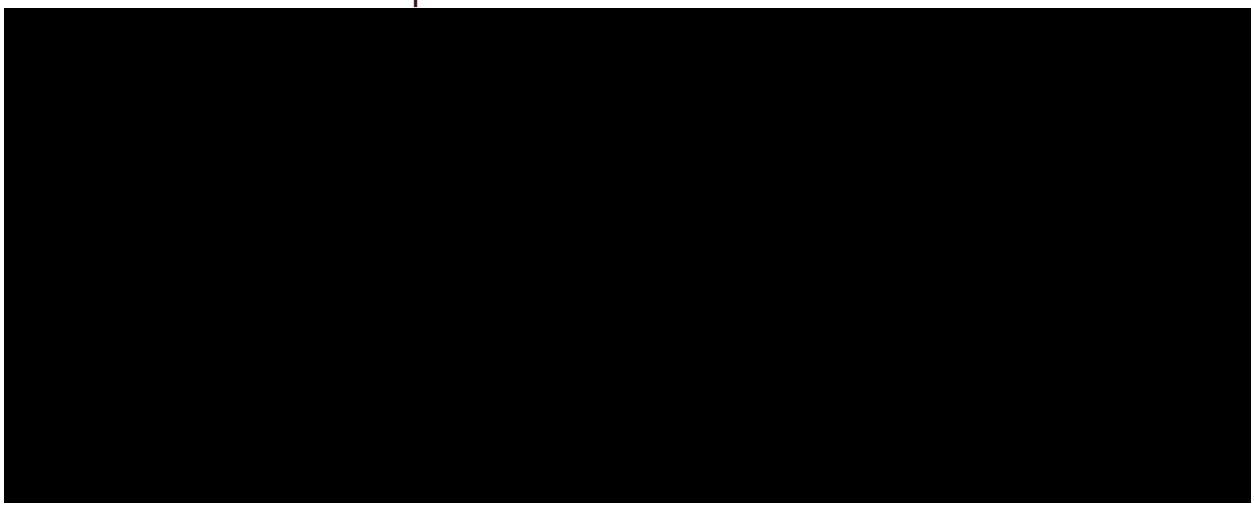


Favorite Add Screen Capture:



API Function Comment Header

Comment Header Screen Capture:



API Function file Screen Capture: