Stock Virtual Machine

WORKBOOK

Team Members:

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Sujay Patel - *Team Leader*
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Client:

Benjamin Hughes

Project Description:

The Stock Virtual Machine is a web application that is designed to simulate buying and selling stocks in the stock market in a very realistic manner. Using the Stock Virtual Machine, user will get the full experience of buying and selling stocks without having to invest any actual currency.

To use the application users visit the web-page and must register. Once registered the user will have a set sum of virtual currency added to a virtual bank account. This money can then be used to virtually invest in stocks.

Collaboration Tool:
Link to the project **git** repository:
https://github.com/sujaypatel/CS422Project

Requirements:

Use Case #1:

Use Case Name	User Registration
Participating actors	New Users
Flow of events	1. User opens the browser and visits the URL localhost. 2. The system displays the Home screen with a Signup, Login, and Help button. 3. User clicks the "Sign up" button. 4. The system takes user to the registration page and asks to enter a username, password and an email address. 5. Once user completes the form, and presses "Create Account" button, the user gets redirected to Portfolio page. 6. The system displays user's portfolio, which contains a username and virtual bank account with $1000 balance.
Entry condition	User access the website through a web browser
Exit condition	User successfully creates the account.
Quality/Nonfunctional Requirements	The application should be loaded in 5 seconds after the user accesses it on a web browser

Use Case #2:

Use Case Name	Login
Flow of events	1. User opens the browser and visits the URL localhost. 2. The system displays the Home screen with a Signup, Login, and Help button. 3. User clicks the "Login" button. 4. The system takes user to Login page and ask user to enter username and password. 5. User enters the required information and clicks the "Submit" button. 6. The system verifies the username and password from database. 7. If the user enters incorrect information, then system asks user to reenter the information. 8. If the user enters correct information then system takes the user to portfolio page.
Entry condition	User access the website through a web browser
Exit condition	User successfully is able to login.
Quality/Nonfunctional Requirements	Authentication should be done within 2 seconds.

Use Case #3:

Use Case Name	Buy Stock
Participating actors	Registered Users
Flow of events	1. User opens the browser and visits the URL localhost. 2. Once the user Login successfully, then the system takes the user to portfolio page. 3. On portfolio page, the system provides user with the username, virtual balance, and three buttons i.e. Buy Stock, Sell Stock, Search Stock. 4. User click on "Buy Stock" button. 5. The system takes user to Buy Stock page where user will be able to select the company name and enter the quantity of stock that user want to buy for a select company. 6. The user click on "Purchase" button. 7. The system makes sure that user has enough amount of virtual money to purchase the stock.

	8. If the user has enough virtual money then the system allows user to purchase the stock and takes the user back to portfolio page.
	9. On the portfolio page, it would display the list of stocks that the user owns and would update the virtual balance.
Entry condition	User access the website through a web browser
Exit condition	User successfully able to purchase the stock.
Quality/Nonfunctional Requirements	Once the user purchase the stock, their virtual balance and their portfolio should be updated within 5 seconds of the transaction.

Use Case #4:

Use case name	Sell Stock
Participating actors	Registered Users
Flow of events	1. User opens the browser and visits the URL localhost.
	2. Once the user Login successfully, then the system takes the user to portfolio page.
	3. On portfolio page, the system provides user with the username, virtual balance, and three buttons i.e. Buy Stock, Sell Stock, Search Stock.
	4. User click on "Sell Stock" button.
	5. The system takes user to Sell Stock page where user will be able to select the company name and enter the quantity of stock that user want to sell for a select company.
	6. The user clicks on "Sell" button.
	7. The system makes sure that user is not able to sell more stock than he owns.
	8. Once the user sells the stocks then the system takes the user back to portfolio page.
	9. On the portfolio page, it would display only the list of stocks that the user currently owns and would update the virtual balance.
Entry condition	User access the website through a web browser
Exit condition	User successfully able to sell the stock.
Quality/Nonfunctional Requirements	Once the user sells the stock, their virtual balance and their portfolio should be updated within 5 seconds of the transaction.

Use Case #5:

| Use case name	Search Stock
Participating actors	Registered Users
Flow of events	1. User opens the browser and visits the URL localhost. 2. Once the user Login successfully, then the system takes the user to portfolio page. 3. On portfolio page, the system display user with the username, virtual balance, and three buttons i.e. Buy Stock, Sell Stock, Search Stock. 4. User clicks on "Search Stock" button. 5. The system takes user to Search page where user will be able to select the company name and click "Search" button. 6. The system displays the stock information and current price of the selected company. 7. If the user want to go back to portfolio page. then the user can click on "Back Portfolio" button.
Entry condition	User access the website through a web browser.
Exit condition	User successfully able to sell the stock.

Use Case #6:

Use case name	Exit Application
Participating actors	Registered Users
Flow of events	1. User opens the browser and visits the URL localhost. 2. Once the user Login successfully, then the system takes the user to portfolio page. 3. The system provides a "Logout" Button on the right side of the screen. 4. User clicks on the "Logout" button. 5. The system saves the user data and goes to login page.
Entry condition	User access the website through a web browser.
Exit condition	User successfully able to logout from the application.
Quality/Nonfunctional Requirements	The game should terminate within 2 seconds.

Non Functional Requirement:

- Few of the non-functional requirements are addressed below:
- **Reliability:** No user data, such as their login credentials or virtual portfolio, should be lost in the event of a failure.
- **Performance:** The detailed information of all the companies shall be loaded from the database within 5 seconds of clicking the "Search" button.
- **Supportability:** If the user forgets their password, the product shall provide a way to recover the user password.
- **Security:** The system will have a secured database.

Use Case Diagram
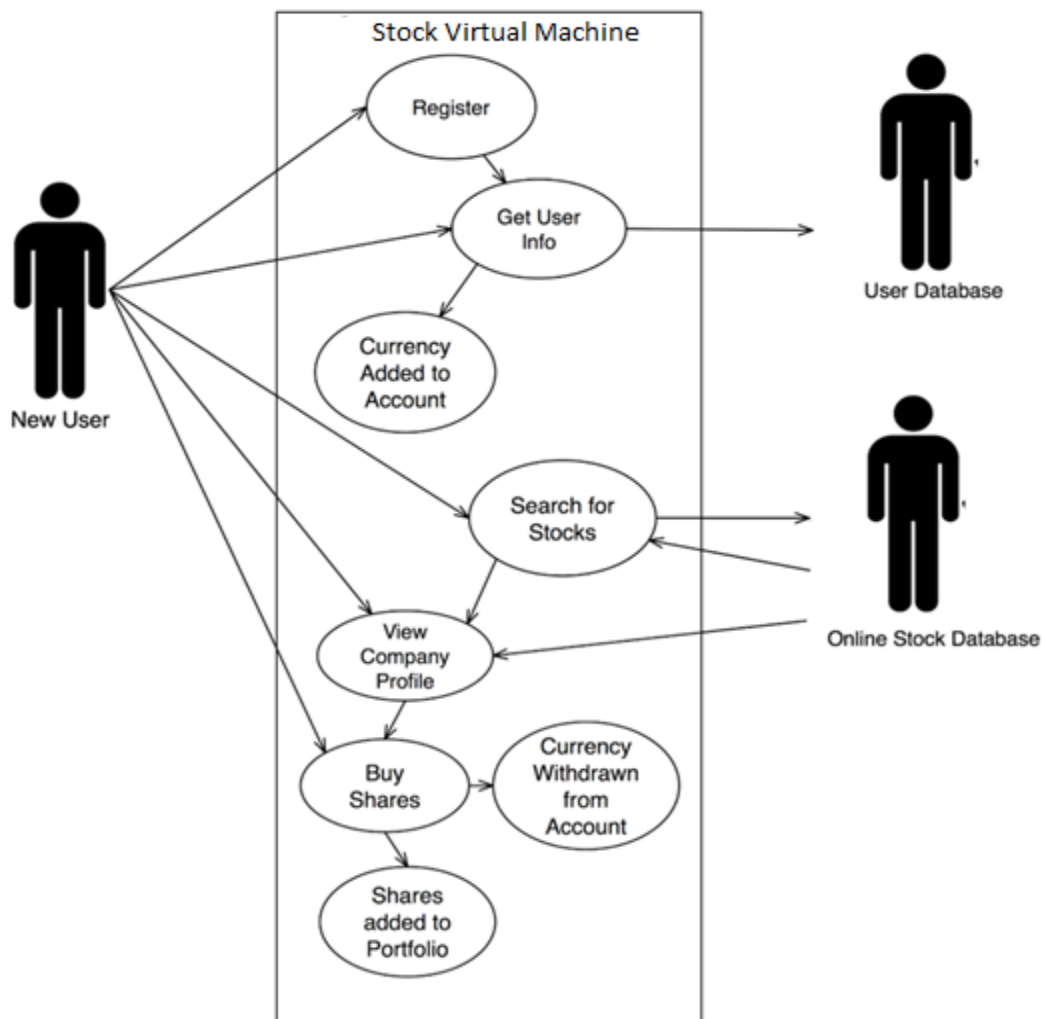
Specifications:

Scenarios:

Ted is an assistant manager at Walmart who wants to invest money in the actual stock market. At the same time, he does not want to lose money in the stock. He is confused on whether or not he should take a risk in investing money in the stock. One of the co worker gives an suggest to Ted to actually learn about how stock market works before investing. Ted decides to find the website where he could learn about stock without actual investing money. He encounter Stock Virtual Machine website. He notices that he could actually learn about how stock prices without investing actual money. Ted creates an account and login. The system takes Ted to his portfolio page. Initial, all the user get $1000 virtual balance once they login. Ted easily notices that he has $1000 virtual money to spend. Ted needs to learn how to make profit. He notices three button "Buy Stock", "Sell Stock", and "Search Stock". First, he decides to click on "Search Stock" button in order to check the price of the stock for the particular company. He then decide to go back and buy the stock of the particular company. Then later Ted decides to buy few more stock of different company. He then wanted to see if he actually made the profit or not, so he decides to sell all the stock. Ted could determine if the made the profit or not based on the virtual balance.

Goals:

Low Target:
Our team goal is to accomplish several things before March 16. We need to implement the design/layout of the website. We need to implement the functionality that allows the user to create an account and login. For security purpose, we need to design the system that only allow user to access his/her portfolio page if the user is login; otherwise, the system shall ask user to login again. The system must allow user to success log out of the system.
Use Cases: User Registration, Login, & Exit Application

Deliverable Target:
Our next step then would be to implement the functionality and database connection of buy, sell, and search stocks feature. Additionally, we need to create a database for storing user stock information. On the user's portfolio webpage, the system need to update the table of the stocks and virtual balance once user makes any transaction. The system must prevent user from buying more stocks than the amount of virtual balance he has.
Use Cases: Buy Stock, Sell Stock, & Search Stock

High target:
At the end, our team goal would be to design the user-interface to make our web application look simple and attractive to the users.

Extras:
Extra feature that could be implemented in the future would be RSS Feed, and Forget Password Recovery.

Non-Goals:

- User authentication should be done within 5 seconds.
- The user should be able to view their latests transactions no later than 5 seconds.
- The system should not crash more than once in a week.
- The system shall ensure that the data is protected from unauthorized access.
- In case of an error, the time needed to get the system back to running should not exceed an hour.
- The system should support multiple users simultaneously.

Group Prototypes

User Login

Once user enter valid username and password then system takes the user to the portfolio page.

HOME | SIGNUP | LOGIN | HELP

Welcome to Stock Virtual Machine

WELCOME

Stock Virtual Machine Web application Which Provides a learning opportunity For new users to become Experts in Stock Market without spending actual money.

To use the application users have to SignUP.
. . . .

HOME | SIGN UP | LOGIN | HELP

Login to Stock Virtual Machine

LOGIN

To use the Program users must register with a Username, Email, and Password.

USERNAME: SUJALPATEL

PASSWORD: ****

LOGIN

Portfolio

Sujal Patel
Virtual Balance : $ 4000

User References
Logout

List of Owned Stock

Symbol	High	Low	Close	Quantity
AAP	120.25	119.5	119.96	5
AAT	156.14	145.7	146.88	2
YHOO	45.20	44.5	44.8	6

BUY STOCK | SELL STOCK | SEARCH

Help Menu

If user needs help using the application. If user click on "Help" then the system takes the user to the Help page.

HOME | SIGNUP | LOGIN | HELP

Welcome to Stock Virtual Machine

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Help Menu

INFORMATION
FAQ
CONTACT US

User Registration

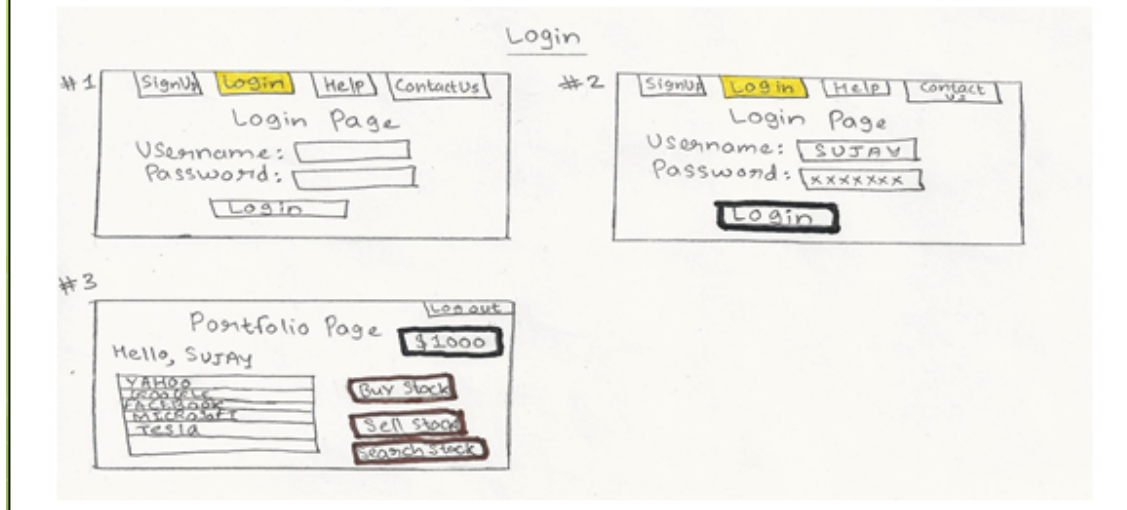# User Login

Help Menu

User Registration

Client Feedback:

On Friday 02/27, all the project team members visited, the client, Benjamin Hughes for discussing the low target prototypes of the Stock Virtual Machine. Benjamin liked the overall layout of the web application and made several suggestion on improving the prototypes based on his requirements. He liked the idea of providing five navigation tabs at the top of the page i.e. Home, Sign up, Login, Help, and Contact Us. He suggested to make the user interface as user-friendly as possible. He also asked us to use less saturated colors as the background of the application. He mentioned that he would like to have a password retrieval feature that would help the users to retrieve their passwords in case they forget them.

Benjamin liked the design of the registration page; however, he highly recommended that the number of fields on the registration page should be kept minimum as users might not like to give out more information than necessary. He suggested to add more detail to the Help page so that the users can get a better understanding on what the web application is about. Overall, the client is impressed by the presented low-target prototypes and he wants to implement most of the features from it.

Schedule:

Wizard of Oz demo:March 16th (low target)
- Implement the Design/Layout of .jsp pages.
- Home, Registration, Login, Help, Contact Us, Forget Password, Portfolio page

Alpha release: April 13th (desirable target)
- Improve the Website Design/Layout using Bootstrap
- Implement the Buy, Sell, and Search Stock page
- Establishing/Storing/Retrieving Database Connection

Beta release (high target) due April 27th
- Improve CSS
- Website Testing

Client Evaluation: May 1st
- Implement fully working website with all features

Public demonstration (high target with fixed bugs): May 8th
- Bug fixes
- Final product released

Alpha Release Report:

Progress
Our team accomplished the low target goal for our presentation on March 16th. During our presentation, we were asked to simplify our website because it seemed like a lot was going on the website and there were too many colors and ideas. After our presentation, we made many changes to our design and color schemes, we have simplified our website. After improving our design, our next goal was to implement the functionality of buy, sell, and search stocks. We have accomplished the implementation of those goals before our alpha release as well.

Current State
Currently, we are successful in implementing the functionalities of buy, sell, and search stocks. We have also given our website a new look that uses consistency, clarity and gives feedback. In the help page, we were able to separate the FAQ by the sections of login, register, portfolio and general information. We were also able to implement the forgot password recovery page and send the user their password to their email.

Layers completed
- Home page
- Register page
- Login page
- Portfolio page
  - Buy stocks page
  - Search stocks page
  - Sell stocks page
- About us page
- Help page
  - General FAQ
  - Login FAQ
  - Register FAQ

Screenshots

Screen 1: Create an Account
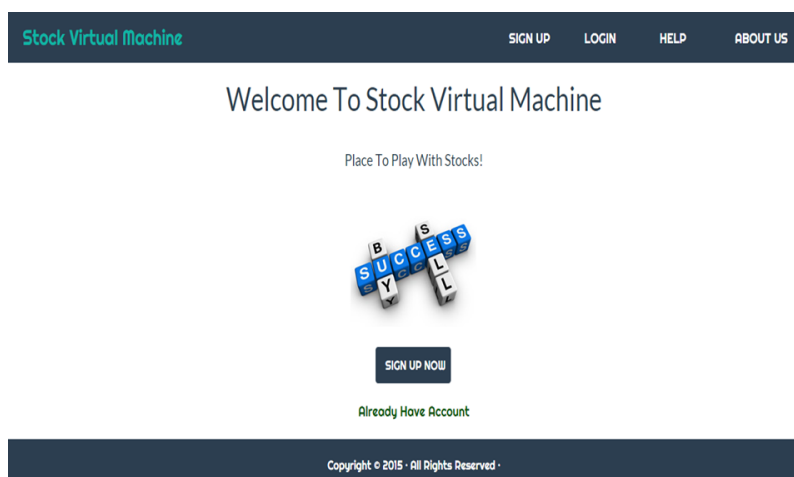
Create an Account

FIRST NAME: [   ]
LAST NAME: [   ]
USERNAME: [   ]
PASSWORD: [   ]
CONFIRM PASSWORD: [   ]
EMAIL ADDRESS: [   ]
SECRET QUESTION [What is your pet's name ▼]
ANSWER [   ]

REGISTER

Screen 2: Login

Login To Stock Virtual Machine

USERNAME: [   ]
PASSWORD: [   ]

SIGN IN

Forgot Password

Screen 3: Help Menu

Help Menu

FAQ

LOGIN

REGISTRATION

PORTFOLIO

Screen 4: Recovery Password
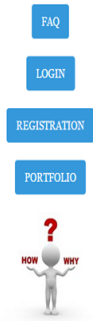
Recovery Password

USERNAME: [Username]
EMAIL ADDRESS: [Someone@gmail.com]

SUBMIT

Screen 5: Portfolio

Portfolio

Welcome, Tom
Virtual Balance: $ 269.31

List of Owned Stocks

Symbol	High	Low	Close	Quantity
YHOO	44.85	43.51	43.99	2
AAON	22.55	21.78	21.81	4
GOOG	539.87	515.52	534.52	1

Buy Stocks   **Sell Stocks**   **Search**

Screen 6: Buy Stocks

Buy Stocks

Virtual Balance: $ 269.31

Select a Company: [Aaon ▼]
Buying Quantity: [   ]

PURCHASE

Ideas we could not accomplish - We were able to accomplish all our features and requirements that we aimed for in the beginning of the project.

Task Report

Each tester was assigned with six tasks in a given time span of 15 minutes:

Task 1: Create an account on Stock Virtual Machine.

Task 2: Log into the account that the user created in Task 1.

Task 3: Understand the layout of the Portfolio page.

Task 4: Search the current stock performance of Google Inc.

Task 5: Buy 15 stocks of Google Inc.

Task 6: Sell 5 stocks of Google Inc.

Task Success

Task	User #1	User #2	User #3
1) Sign Up	PASS	PASS	PASS
2) Login	PASS	PASS	PASS
3) Portfolio	SMALL ISSUE	PASS	PASS

4) Search Stock	PASS	SMALL ISSUE	PASS
5) Buy Stock	PASS	PASS	PASS
6) Sell Stock	PASS	PASS	PASS

Time on Individual Task

Task	User #1	User #2	User #3
1) Sign Up	45 secs	39 secs	35 secs
2) Login	15 secs	10 secs	12 secs
3) Portfolio	25 secs	10 secs	15 secs
4) Search Stock	20 secs	25 secs	15 secs
5) Buy Stock	15 secs	20 secs	17 secs
6) Sell Stock	20 secs	18 secs	15 secs

Alpha Release Testing Results

Questionnaire used for users' feedback:

- At any time, were you unsure as to how to proceed? If so, describe:
  Most of the users were not sure what the prices of the stocks were. If a user goes directly to the Buy Stock page, then he/she would not be able to know the price of the stocks because the only way to check the price of stocks is to search the stocks on the Search Stocks page.

- How easy was it to navigate between different web pages?
  All the users mentioned that it was very easy to navigate between different web pages.

- Was it easy to get to the home page from the page you started on?
  All the users said it was easy to get to the homepage from the page they started on.

- Name your two favorite and least favorite things about this site?
  Favorite things: color scheme, button colors, user interface, clear to understand, pictures

Least Favorite things: *High, low, and medium (testers did not understand the meaning on those two words in context to the website.

*We will be adding definition of the high, low and medium on the website so the user does not get confused.

- How did you feel about the color scheme and structure of the website?
  Testers thought the color scheme was good and simple.

- If you could make one significant change to this website, what change would you make?
  One of the tester suggested that he would like to see the buttons re-ordered on the portfolio page. Instead of the Buy Stock, Sell Stock, Search Stock button order. He recommended to re-order the buttons in the sequence of Search Stock, Buy Stock, and Sell Stock. According to him, it would be more convenient if he would have first search the performance of the company's stock, before he purchase them.

- Do you have any other questions or comments about the website or your experiences with it?
  One of the testers suggested that we should not use "Go Back to Portfolio", we should use "Go Back" as a signifier instead.

- Are there materials you would like to see added to the Web site? Which ones?
  One of the testers said that he would like to see a trending bar on the website so that the user knows which stocks are doing well and which ones are not, comparatively.

- What was your overall impression of the website?
  Overall, the testers liked our website and appreciated its simplicity.

- On a scale of 1 to 10, how would you rate the user interface it terms of design and feel, with 1 being poor and 10 being excellent?
  Most of the testers found the user interface very easy to understand and self-explanatory. The average user rating for the user interface was 9 out of 10.

- What would encourage you to return to this site in the future?
  All the users said their incentive to come back would be if they could make more money.