**Requirements**

To make sure we provide our client with a final product which best matches their criteria, it is highly important we make sure we meet all necessary requirements. We must identify all the different stakeholders of the system and what they need from the program so we can then specify the requirements for the system.

User Stakeholders:

The CSS

The Computer Science Society is hosting the entire event therefore they will be using the system to manage the program and analyse the performance of the players to determine the winners of the event. Their key interests would be the ability to:

* Access all the players accounts so they can track all their earnings/score/trading history to ensure a winner of the game can be determined.
* Have access to a leader board clearly showing all students positions against one another
* Let the program run on a clear and suitable website which allows the stock market to assessable to all players from any of their devices.
* Have the program simulate stocks in the most realistic way possible via having the stocks affected by a news feed, other players trades, computer bots etc.
* Access information about the programmed bots to allow the control of bots which will make automatic trades to fluctuate the stock market

The University of Bristol

Although the University of Bristol do not directly interact with the system they are highly impacted by its success as it will encourage computer science students to join the university. Thus, they have a legitimate vested interest in the project. Their key interests would be:

* The game is produced to a high standard to demonstrate the extensive skill set which can be developed from studying Computer Science at the University of Bristol.
* The game is enjoyable to play with to generate excitement within students to take Computer Science at the University of Bristol so they can create similar projects themselves.
* The game should handle many students using it simultaneously, ensuring there is no limit on the number of students which can play, maximising student interest in the course.

Students

The students are the main users of the program. They will be the ones creating accounts to complete the trading of stocks based on information given to them by the news feed which effects the relevant stocks. Their key interests would be the ability to:

* Have a clear, easy-to-use UI which they can complete all necessary actions to play the game.
* Only make changes to their stonks after providing valid credentials to ensure other players cannot make any alterations.
* Have an easy-to-use news feed which is constantly updating and delivering new pieces of information on the Stonks companies which they can use to influence their trading decisions.
* Have access to a list of all the Stonks companies available along with their current prices.
* View their previous transactions and their balances to gauge how well they are doing.
* Have access to an easy to read the leader board showing the ranking of all the other players in the game to compare their success against others.
* Have access to a graph showing how the value of any stonk has varied over time

User stories

The use of user stories will enable us to more deeply understand how players will be using the system. We have created a 3 user stories for each of the stake holders, focusing on a range of different aspects of our system, allowing us to have a definitive understanding on how the program will be used. For key stories we have provided steps we will take to ensure their goals are achieved.

CSS :

* As the leader of the CSS, It's important that the system can be accessed by all members of the CSS via a nicely designed and easy to use website.
* As the leader of the CSS, I should be able to view the information on all the players including their trading histories, current balance, position on the leader board.
* As the leader of the CSS, I should have access to the information of any computer controlled bots which are used to influence the market and keep it volatile.

Students :

* “As a player of the game I should be able to create an account which I can login at any time to play the game and complete any necessary changes.”
  + We will have a system of only being able to make changes to a players bot when the correct TeamName and TeamCode parameters are given, acting as login credentials.
* “As a player of the game I should be able to easy manoeuvre around the website and complete any tasks that need to be done such as buying and selling stocks.”
  + The website will be designed simplistically with clear headings and drop down options to ensure swift navigation. Clear documentation will be provided on how to do all necessary actions such as buying and selling stonks
* “As a player of the game I should be able to have access to the newsfeed and view the graphs of the stocks for all the companies at ease so I can come to a justified decision before completing any trades.”
  + The newsfeed will be easily accessible with the ability to scroll through the recent stories to ensure nothing is missed. The stories will be clear and comprehensible which along with the graphs, should allow a justified trading decision to be made.

The following User flows Demonstrate the ways in which we expect the students to use our program. They demonstrate the steps involved with ensuring all the user stories objectives are met:

Normal Flow:

1. Reads welcome page, giving an overview on how the game works
   1. Opens the documentation page on interactions with the Stonks server
2. Enters a TeamName, TeamCode and BotName to login and make their bot
   1. Bot is successfully added
3. Opens the market page to see list of available Stonks
   1. Views the Stonks current price
   2. Toggle selected Stonks onto the graph to visually see its recent behaviour
4. Opens dashboard to check news feed
   1. Checks leaderboard to see how well they are doing
5. Check status of bot (wealth, stonks owned etc.) from http requests
6. Buy a single stonk as they have enough money
7. Sell the single stonk they currently own

Alternate Flow:

1. Reads welcome page, giving an overview on how the game works
2. Enters a TeamName, TeamCode and BotName to login and make their bot
   1. Bot is successfully added
3. Opens the market page to see list of available Stonks
   1. Views the Stonks current price
   2. Toggles 5 selected Stonks onto the graph
   3. Selects “show lifetime behaviour” to see the whole history not just recent behaviour
4. Opens dashboard to check news feed
   1. Checks transaction history to see which stocks are popular
5. Check status of bot (wealth, stonks owned etc.) from http requests
6. Buy multiple stonks when they have sufficient funds
7. Sell multiple stonks which they currently own
8. Short a stonk as they have no shares in the requested stonk
9. Checks the information on the interest on current shorted stonk via https requests
   1. Covers a stonk as they have enough money to short it

Exceptional Flow:

1. Reads welcome page
2. Enters a TeamName and TeamCode but enters an already used BotName
   1. Error message is displayed stating BotName is already in use (Bot is not added).
   2. Enters a valid BotName which successfully adds a bot
3. Check status of bot via http requests but mistypes their BotName
   1. Error message displayed stating provided bot does not exist
   2. Enters a valid BotName thus information is successfully provided
4. Opens dashboard to check news feed
5. Tries to buy multiple stonks with a combined value which is higher than their current wealth
   1. Error message displayed stating they have insufficient funds
   2. Tries to buy a reduced number of stonks so the combined value is less than current wealth
   3. Stonks successfully bought
6. Tries to sell a stonk which does not exist
   1. Error message is displayed stating the stonk does not exist
   2. Tries to sell a stonk that they own
   3. Stonk is successfully sold
7. Tries to short a stonk they already own
   1. Error message is displayed stating they cannot short a stonk they already own
   2. Tries to short a stonk they do not own
   3. Stonk is successfully shorted

In the below table we have listed all the functional requirements this project will have, along with the reason they are important and their level of priority. These requirements denote the requirements that are important to ensure the platforms success.

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| Req No. | Description | Justification | Priority (1-10) |
| 1 | Web Based Application | To allow the students to access the game, it must be developed as a web application so multiple users to play live at the same time. | 10 |
| 2 | Players have access to view their earnings | So students know how much money they have thus know the appropriate trades they can undertake. | 9 |
| 3 | Players have access to view their trading history | To allow students to see what trades they have previously done ensuring they can come to an informed decision on their next trades | 6 |
| 4 | Players each have a score | To allow a ranking between all the players on their trading so a leader board can be created, and winner can be determined. This will be determined via the metric of their balance and the value of their stonks. | 6 |
| 5 | Players have access to the leader board | To allow students to see how they are doing compared to their competition, so they know how much more they need to achieve to win. | 6 |
| 7 | Stonks value changes | To allow each Stonk to change its value. This will be done by assigning it with a length of time a change will happen in and changing its value incrementally over this period until reaching the intended value. | 10 |
| 8 | The Stonk market contains a list of all the stonks imported from a csv file | To allow for the stonks and their associated information to be easily edited and changed before being imported into the program. Enables easy future amendments of stonks. | 10 |
| 9 | There is a news feed providing players with information about each company | To allow for a more accurate representation of a stock market with information being provided on events happening to each company which could affect its associated stonks positively or negatively. | 8 |
| 10 | Each player can only make changes to their stonks and no others | To ensure the game is kept fair as no other players can make changes. This will be done by requesting player determined credentials before each change. | 9 |
| 11 | Stock market is constantly being updated | To allow for a more accurate representation of the ever-changing nature of the real world stock market. | 10 |

In the below table we have listed all the non-functional requirements along with the reason they are important and their level of priority. These requirements denote the requirements which help improve the program’s effectiveness but are not vital for the program to work.

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| Req No. | Description | Justification | Priority (1-10) |
| 1 | Clean and simplistic website design | To ensure lack of confusion when navigating through the website and improving enjoyability of playing the game through an aesthetically pleasing design. | 8 |
| 2 | Website elements scale correctly for all display sizes | To ensure the layout still appears clearly for the large range of different screen sizes each player may have on their computer. | 8 |
| 3 | Stonk changes including random fluctuation | To allow the volatile semi unpredictable nature of the real life stock market to be more closely imitated by the program by using randomised values. | 9 |
| 4 | Help menu/ initial tutorial | So each player understands how the stock market works and how to play the game, ensuring enjoyability and lack of confusion when using the program | 8 |
| 5 | Shorting and Covering stonks | To allow our market to simulate the real stock market more closely by letting players short selling stonks. Further adds to the experience. | 7 |
| 6 | Bots are utilised to complete trades automatically | To allow the stock market simulation to be more realistic, programming bots to complete trades keeps each stock more volatile and less predictable, increasing effectiveness. | 8 |