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## Final Write Up: Investing Game

### **Executive Summary**

There are many programs out there to learn how to invest and pull information from online sources. Most of these programs however are focused in individual stocks that are publicly traded on the U.S. stock exchanges. I want to learn more not just about stocks but indices that are traded globally. I am going to be starting my first job in a couple of months and I want to understand the principles of value investing, particularly in these global stocks and indices. When I sign my paperwork about how I want to invest my savings, I want to have a good idea where and why.

Therefore, I created an investing tool to create value portfolios in equities. The program is created to create global value portfolios, compare them, and track them over time. In order to better learn the global equities, I decided to create a game. The game is used mostly as a simple benchmark while the program itself is meant to help the user familiarize themselves with stocks and indices.

### **Implementation Documentation**

This project consists of six main processes:

1. New Game
2. Explore New Stocks
3. Buy
4. Update Portfolio
5. End Game

## 6. High Scores

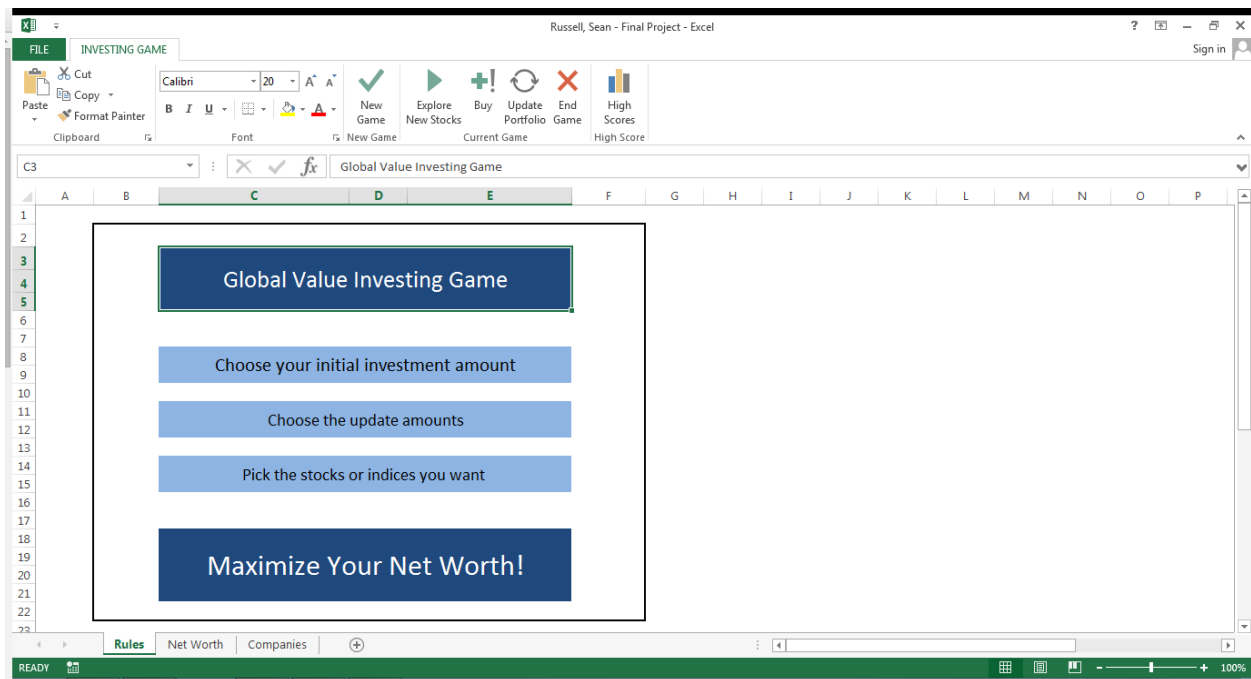
I will begin with the introduction to what you see when you open the project and then walk through each of the major processes.

### *Introduction*

When you first open the document you will see three open sheets. They are the rules, net worth, and companies sheets. You will notice that the ribbon on top of the screen is adjusted to only allow simple functionality and the macros for the game.

The rules sheet is a brief overview of the game. The net worth is the summary of your portfolio when updated as well as information relative to the game you are playing. The companies sheet is the skeleton for the securities you will be exploring and buying.

### Rules sheet



## Net worth sheet

Russell, Sean - Final Project - Excel

FILE INVESTING GAME

Clipboard Font New Game Current Game High Score

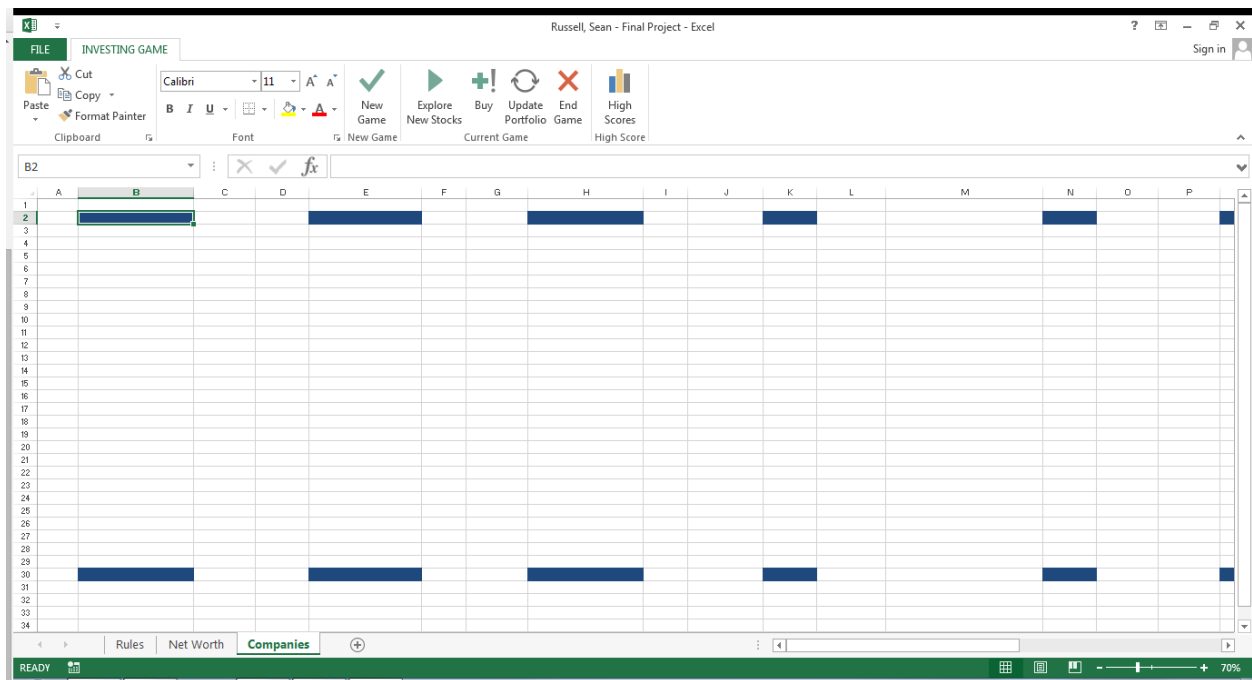
B2 Game Name

Game Name	Initial Investment	Remaining Capital	Net Worth
Initial Updates		\$ -	
Updates Left			\$ -
TOTALS	\$0.00	\$0.00	\$0.00
Security Number	Security	Bought	Current Profit / Loss
1			\$0.00
2			\$0.00
3			\$0.00
4			\$0.00
5			\$0.00
6			\$0.00
7			\$0.00
8			\$0.00
9			\$0.00
10			\$0.00
11			\$0.00
12			\$0.00
13			\$0.00
14			\$0.00
15			\$0.00
16			\$0.00
17			\$0.00
18			\$0.00
19			\$0.00
20			\$0.00
21			\$0.00
22			\$0.00
23			\$0.00
24			\$0.00
25			\$0.00

Rules Net Worth Companies

READY 90%

## Companies sheet



### *New Game*

This is the first process to get the game going. It asks for you to name the game, set an initial investment amount (basically how much you want to invest over the course of the game period), as well as the number of updates you want to provide yourself with.

Game Options

Game Name

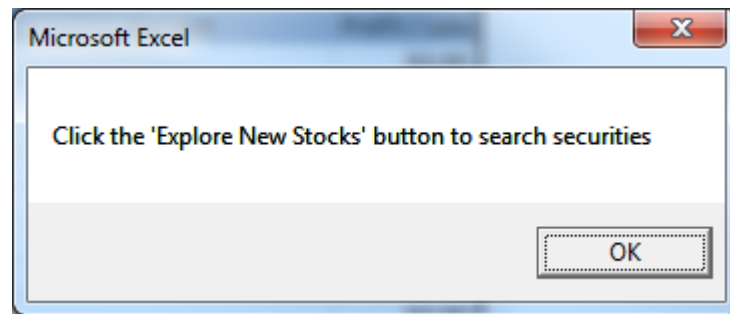
Starting Investment Amount

Number of Updates Allowed Per Game

Launch Game Cancel

New game input box

From these inputs, the game initializes on the net worth tab and allows for functionality with the other processes. Prior to this, the other buttons will not function. After initializing the game, you will be prompted to start exploring stocks and indices.



Message box after initializing the game

 A screenshot of an Excel spreadsheet titled "Russell, Sean - Final Project - Excel". The active tab is "INVESTING GAME". The spreadsheet contains a table with the following data:
 

Game Name	Write up example	Initial Investment	\$ 100,000
Initial Updates	3	Remaining Capital	\$ 100,000
Updates Left	3	Net Worth	\$ 100,000
TOTALS		\$0.00	\$0.00
Security Number	Security	Bought	Current
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
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25			

 The bottom of the spreadsheet shows tabs for "Rules", "Net Worth", and "Companies". The status bar at the bottom indicates "READY" and "90%".

Initialized Game

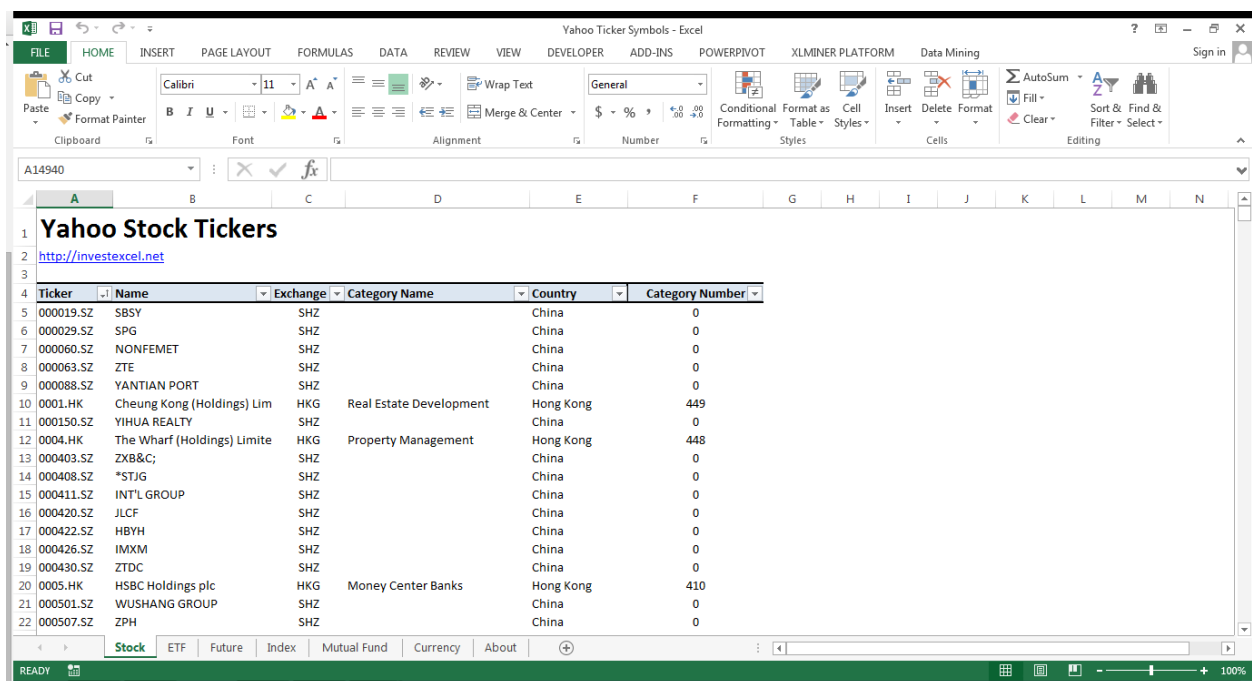
### *Explore New Stocks*

This is a process that has a lot of steps to it. The main ones are the following:

- Scrape securities data file

- Initialize user form
- Create companies page from Yahoo Finance

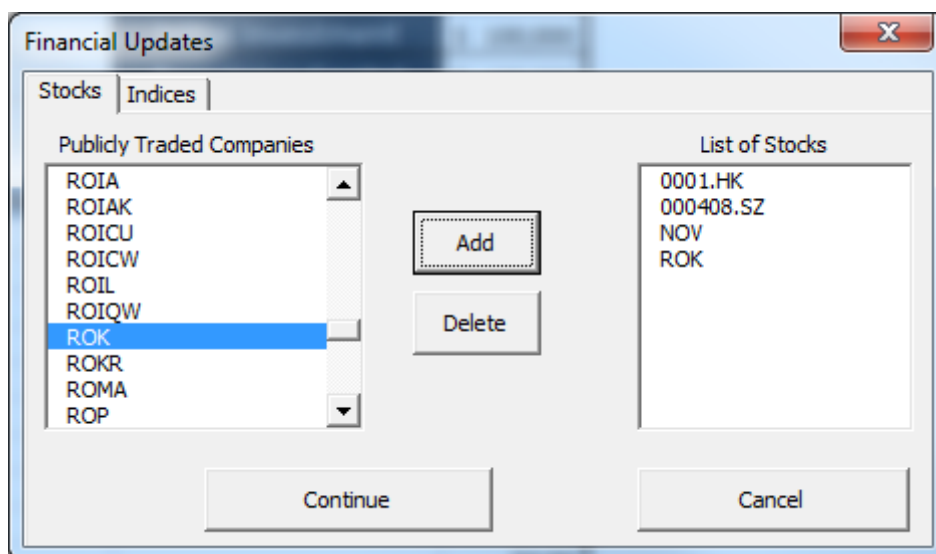
First, by pressing the button, the program will go and gather all of the publicly traded stocks and indices' ticker names and add them to their respective lists in the user form.



Ticker	Name	Exchange	Category Name	Country	Category Number
000019.SZ	SBSY	SHZ		China	0
000029.SZ	SPG	SHZ		China	0
000060.SZ	NONFEMET	SHZ		China	0
000063.SZ	ZTE	SHZ		China	0
000088.SZ	YANTIAN PORT	SHZ		China	0
0001.HK	Cheung Kong (Holdings) Lim	HKG	Real Estate Development	Hong Kong	449
000150.SZ	YIHUA REALTY	SHZ		China	0
0004.HK	The Wharf (Holdings) Limite	HKG	Property Management	Hong Kong	448
000403.SZ	ZXB&C;	SHZ		China	0
000408.SZ	*STJG	SHZ		China	0
000411.SZ	INT'L GROUP	SHZ		China	0
000420.SZ	JLCF	SHZ		China	0
000422.SZ	HBVH	SHZ		China	0
000426.SZ	IMXM	SHZ		China	0
000430.SZ	ZTDC	SHZ		China	0
0005.HK	HSBC Holdings plc	HKG	Money Center Banks	Hong Kong	410
000501.SZ	WUSHANG GROUP	SHZ		China	0
000507.SZ	ZPH	SHZ		China	0

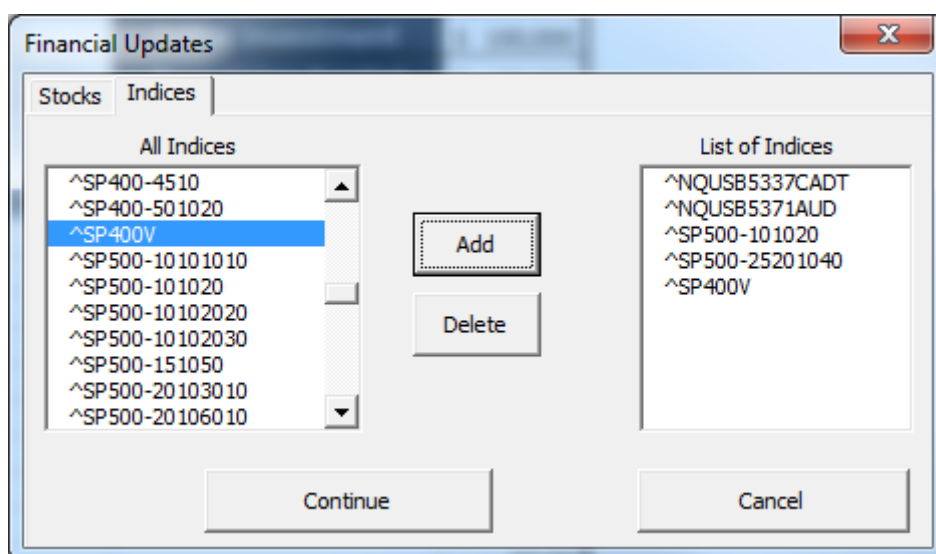
Yahoo Stock / Index Ticker Database

After scrapping this data file, the macro will create a user form with lists of the global equities with the functionality to move them to be analyzed. Within this user form, you can add the stocks and indices you want, delete them from your lists, cancel the user form, and continue to download their information.



The 'Financial Updates' dialog box is shown with the 'Stocks' tab selected. It features two main list areas: 'Publicly Traded Companies' on the left and 'List of Stocks' on the right. The 'Publicly Traded Companies' list includes ROIA, ROIAK, ROICU, ROICW, ROIL, ROIQW, ROK (highlighted), ROKR, ROMA, and ROP. The 'List of Stocks' contains 0001.HK, 000408.SZ, NOV, and ROK. Between the lists are 'Add' and 'Delete' buttons. At the bottom are 'Continue' and 'Cancel' buttons.

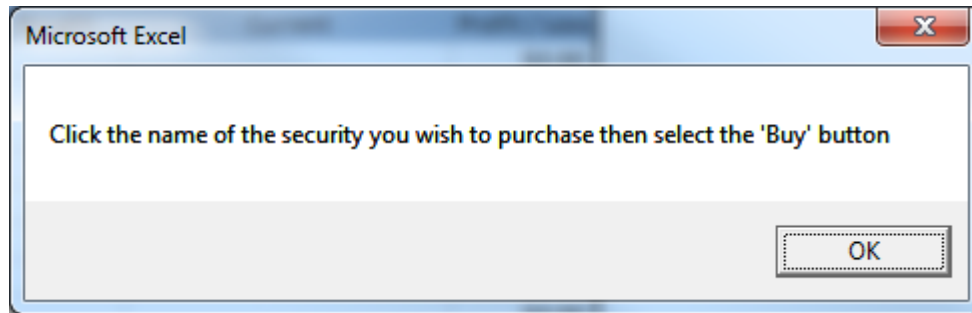
Stock tab of user form



The 'Financial Updates' dialog box is shown with the 'Indices' tab selected. It features two main list areas: 'All Indices' on the left and 'List of Indices' on the right. The 'All Indices' list includes ^SP400-4510, ^SP400-501020, ^SP400V (highlighted), ^SP500-10101010, ^SP500-101020, ^SP500-10102020, ^SP500-10102030, ^SP500-151050, ^SP500-20103010, and ^SP500-20106010. The 'List of Indices' contains ^NQUSB5337CADT, ^NQUSB5371AUD, ^SP500-101020, ^SP500-25201040, and ^SP400V. Between the lists are 'Add' and 'Delete' buttons. At the bottom are 'Continue' and 'Cancel' buttons.

Index tab of user form

By pressing the continue button, the macro will pull the financial data from Yahoo Finance and organize the information into the companies sheet. Before allowing you to see the companies sheet, you are notified that you can buy securities.



Message after gathering data from Yahoo Finance

The screenshot shows an Excel spreadsheet with the following data:

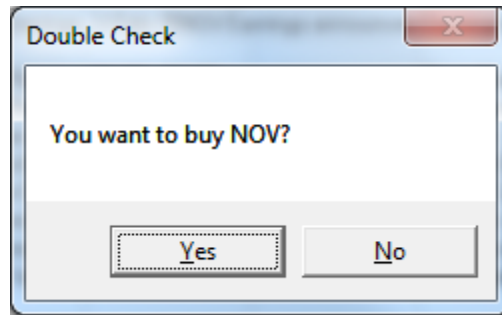
Company	Symbol	Prev Close	Open	Bid	Ask	1/2 Target Est	Beta	Next Earnings	Day's Range	52wk Range	Volume	Avg Vol (3m)	Market Cap	PIE (tm)	EPS (tm)	Div & Yield	Annual EPS E	Quarterly EPS	Mean Reconn	PEG Ratio (5 y)
0001.HK	0001.HK	132.8	134	N/A	N/A	N/A	N/A	N/A	131.30 - 134.00	111.00 - 152.00	3,728,234	3,334,410	305.04B	7.06	18.65	3.48 (2.66%)	N/A	N/A	1-Jan-00	N/A
000408.SZ	000408.SZ	5.91	N/A	N/A	N/A	N/A	0.15	N/A	5.91 - 5.91	5.41 - 7.50	0	N/A	N/A	N/A	N/A	N/A (N/A)	N/A	N/A	N/A	N/A
NOV	NOV	63.01	62.32	60.00 x 200	67.73 x 100	77.84	1.34	3-Feb-15NOV Earnings announcement	60.88 - 62.50	60.88 - 68.55	5,578,309	4,780,200	26.50B	10.31	5.97	1.84 (2.90%)	Forward PIE (1	1.1	3-Dec-14	N/A
NOV	NOV	106.89	105.58	48.66 x 300	118.00 x 100	123.28	1.07	Earnings Date Jan 27 - Feb 2 (Est.)	104.77 - 106.88	38.55 - 128.57	1,780,454	1,094,920	14.23B	17.73	5.91	2.60 (2.40%)	Forward PIE (1	2.15	13-Nov-14	N/A
SP500-1010	SP500-1010	576.01	575.74	N/A	N/A	N/A	N/A	N/A	564.24 - 575.74	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Annual EPS E	1.61	2.4	N/A
SP500-2520	SP500-2520	619.04	619.04	N/A	N/A	N/A	N/A	N/A	605.68 - 621.73	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Annual EPS E	1.54	2.7	N/A
SP400V	SP400V	439.63	439.05	N/A	N/A	N/A	N/A	N/A	432.48 - 439.05	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Annual EPS E	1.54	2.7	N/A

Companies sheet after gathering data from selected stocks and indices

## Buy

After pulling down the desired company data, you can now purchase securities. Selecting the name of the security you wish to purchase. Follow this by clicking the buy button which will prompt you verify that you want to purchase that stock. The process for purchasing a security is based on where you place the active cell. I could have used a user form to take out input error but I wanted the user to be able to purchase stocks from the company dashboard instead of going to another user form.





Verify prompt

Once the user verifies that they want to purchase the security, the purchase price and the company name is sent to an Access database representing your current portfolio.

### *Update Portfolio*

Once the user has purchased the securities they want, they are able to click the update portfolio button which imports the portfolio database and place it on the net worth sheet. Here the securities' information, game stats, and net worth stats are updated.

The screenshot shows an Excel spreadsheet with the following data:

Game Name	Write up example	Initial Investment	\$ 100,000
Initial Updates	3	Remaining Capital	\$ 96,112
Updates Left	2	Net Worth	\$ 99,998
<b>TOTALS</b>		\$3,888.44	\$3,886.80 (\$1.64)
Security Number	Security	Bought	Current
1	NOV	\$63.01	\$62.32 (\$0.69)
2	*NQUS8537CADT	\$1,364.47	\$1,360.03 (\$4.44)
3	*NQUS85371AUD	\$1,265.91	\$1,269.67 \$3.76
4	*SP500-2520104Q	\$619.04	\$619.04 \$0.00
5	*SP500-101020	\$576.01	\$575.74 (\$0.27)
6		\$0.00	\$0.00
7			\$0.00
8			\$0.00
9			\$0.00
10			\$0.00
11			\$0.00
12			\$0.00
13			\$0.00
14			\$0.00
15			\$0.00
16			\$0.00
17			\$0.00
18			\$0.00
19			\$0.00
20			\$0.00
21			\$0.00
22			\$0.00
23			\$0.00
24			\$0.00
25			\$0.00

Net worth sheet after updating portfolio

By using up all of your updates, the game will automatically end and move through the process. You can add more securities up to your remaining capital but you won't have their performance unless you update the portfolio. The idea here is that the user could create a portfolio and set it aside for a significant amount of time as a value investor instead of constantly checking their portfolios.

### End Game

The game will end by either pressing the end game button or by running out of updates. Once the game is ended, the net worth and companies sheets are cleared. The portfolio database is sent to the high score database and the portfolio database is cleared for the next game.

### High Scores

You will be shown the high scores naturally after ending the game. However, if the user wants to see the leaders in the past, they can look at them at any time. The most recent game with its portfolio will not be sent to the high score board and shown until the user decides he want to terminate the game.

Observation	NetWorth	GameName	InitialInvestment	PercentChange
2	\$1,000.00	Sean's Game	\$1,000.00	\$0.00
3	\$1,000.00	Crazy Game	\$1,000.00	\$0.00
4	\$1,000.00	So much money	\$1,000.00	\$0.00
5	\$1,000.00	So much money	\$1,000.00	\$0.00
6	\$1,000.00	Sean's Awesome Game	\$1,000.00	\$0.00
7	\$1,000.00	Sean's Awesome Game	\$1,000.00	\$0.00
16	\$4,964.00	Sean's Incredible test	\$5,000.00	\$0.00
17	\$4,964.00	Sean's Incredible test	\$5,000.00	\$0.00
18	\$7,999.56	Test 2	\$8,000.00	\$0.00
19	\$9,961.44	Test 4	\$10,000.00	\$0.00
20	\$10,001.31	Test 5	\$10,000.00	\$0.00
21	\$99,995.37	Test 7	\$100,000.00	\$0.00
22	\$99,937.19	Test 8	\$100,000.00	\$0.00
23	(\$135.99)	Test 9	\$10,000.00	\$0.00
24	\$99,998.36	Write up example	\$100,000.00	\$0.00

High score sheet

The information is sorted into a table for the user to see the desired results.

### **Learning and conceptual difficulties**

I learned a great deal doing this project. I learned the value of effectively planning out not only your objective but a detailed process on how you intend to complete it. I tend to be fairly thorough upfront but I realized how much more important this is when you are working with multiple files and databases. Alongside the planning stage, I learned a lot about interacting with databases, pulling information from the web, error handling, and dynamic objects. I found a lot of my difficulty during the project had to do with simple little errors as well as dealing with dynamic objects. A lot of my time was spent trying to find workarounds to a pivot table, a query, or a table that wouldn't update with new data. In addition to the updating, a large amount of my time was spent getting the data into fixed locations because I had a hard time setting dynamic locations (particularly when sheets were being added and deleted often). I feel that I created the functionality that I wanted with the project given the time but I realize that there are many ways that I could have done things simpler.

### **Assistance**

I did not receive any assistance on this project. I was heavily sifting through forums, previous projects, and online articles for insights about certain process or codes. I applied a lot of the concepts from the online sources but copied only a handful of lines of code. Apart from that, I did not have any coding assistance from TA's or the Professor on this project.