

Project Proposal

Software Engineering

Group PitFail

PitFail: An Online Finance Game

<https://github.com/pitfail/pitfail-reports/wiki>

9/14/2011

Brian Goodacre, Michael Koval, Owen Healy, Cody Schafer

Project Proposal for PitFail

Project Title	2
Project Website	2
Team Members	2
Team Profile	3
Individual Strengths	3
Michael Koval	3
Cody Schafer	3
Brian Goodacre	3
Owen Healy	3
Differentiating Features	3
Proposed Project	3
Expected audience	3
Accessing the software	4
Web	4
Twitter	4
Trading through Twitter	4
The PitFail Website	5
View their portfolio	5
View the historical value of their portfolio	6
Make a trade	6
See recent activity by other users	7
See rankings of portfolios	7
Comment on other users' trades	7
Rate other users' trades	8
Designing Securities	9
Prediction Market Voting	9
Teams + Leagues	10
Teams	10
Leagues	10

Project Title

PitFail: An Online Finance Game

Project Website

<https://github.com/pitfail/pitfail-reports/wiki>

Team Members

- Michael Koval mkoval@eden.rutgers.edu
- Owen Healy owenh@eden.rutgers.edu
- Cody Schafer cschafer@eden.rutgers.edu
- Brian Goodacre bgoodacr@eden.rutgers.edu

Team Profile

Individual Strengths

Michael Koval

Web design, CSS, data structures, Java, C#, Python, C++, algorithms. Experience working at Microsoft and DoD.

Cody Schafer

Microcontroller programming, enterprise software development with IBM, Fortran, C, C++, Python, Java

Brian Goodacre

Data modeling, database development, UML diagrams, software engineering process, Java, MySQL, Apache, Leadership.

Owen Healy

Haskell, Scheme, Scala, R, Prolog, category theory, C, Python, UML, experience at small tech startups.

Differentiating Features

- Zero-setup interface
- Trading over Twitter
- Designing derivatives
- Teams can play with common portfolio

PitFail is less focused on *simulation* than on *playing a game*. Existing trading simulations mimic the inconveniences of trading stock on real markets; while this is nice for future traders hoping to practice it is out of place and confusing to the vast majority of users.

Proposed Project

The proposed project is a simulation of financial trading and financial engineering. Users can buy and sell stocks and other "standard" products from an exchange, as well as trade with each other and design new derivatives.

Expected audience

We imagine the software will be used by

- Teachers and their students in economics classes
- Curious people who want to try out trading in a simulated environment.

The features are designed with those groups in mind. Most trading simulation websites appear to be targeted primarily at students. PitFail aims to make things easier for the casual user.

Accessing the software

There are two ways to access the software:

- A dedicated website
- Through Twitter

Each is targeted for its own purposes:

Web

- **Audience:** Teachers and students
- **Purpose:** Plots, graphs, consolidated information, ad revenue

Twitter

- **Audience:** Casual users, people who already use Twitter
- **Purpose:** Very low barrier to start using, lets you play around, familiar UI, integrated with everything

Trading through Twitter

While accessing some software through Twitter would be unruly, financial trades are atomized and compact enough that they can be expressed naturally through small messages.

The software has a Twitter account tentatively called `pitfail`. Users direct their tweets to `@pitfail`, e.g.:

```
@pitfail #buy $100 of ABC
```

Critically, **there is no setup needed**. The instant a user sends a tweet to `@pitfail`, an account is created for them with a default setup, and PitFail remembers them next time they talk. This feature is crucial to PitFail's viability: such a large number of financial trading simulations already exist, that it is near-impossible for users to differentiate between them. Because PitFail requires essentially no commitment it is easy for users to try it out.

Compare, for example, [Economics Wisconsin](#) which requires you not only to create an account to start using their site:

But also to join a particular "challenge":

[Challenge Information](#)

Challenge Fall2011

And because there are *no steps*, users won't get lost in [labyrinths like this one](#) (The Stock Market Game).

For reasons of advertising revenue, however, it is desirable to draw users to the PitFail site, and so links can be provided to features such as portfolio listings and graphs.

The PitFail Website

Through the PitFail website users can

View their portfolio	5
View the historical value of their portfolio	6
Make a trade	6
See recent activity by other users	7
See rankings of portfolios	7
Comment on other users' trades	7
Rate other users' trades	8

View their portfolio

Such as on Investopedia:

Game: Investopedia Game 2011 No End

Market is Currently Closed - Opens in 1 day 11 hours 39 minutes ([Refresh](#))

Active Game - Investopedia Game 2011 No End

Account Value (USD): \$100,000.00 **Buying Power:** \$100,000.00 **Cash:** \$100,000.00 **Annual Return:** 0.00 %

Stock Portfolio

Trade Stock Symbol Lookup More

[Cancel Edit](#) [BMY](#) - BRISTOL-MYERS SQUIBB Qty: 100 Buy Market Open Current Price: \$29.16

You have not bought any stocks yet. Learn about stocks from Investopedia's [Stock Basics Tutorial](#) or [Stock Picking tutorial](#), and view the Simulator How-To Guide's section on [Buying Stocks](#).

Option Portfolio

Trade Options Symbol Lookup More

You have not traded any option positions in this portfolio. Learn about Options from Investopedia's [Options Basics Tutorial](#) and [Option related FAQs](#).

Serious Investors Only - ([Get a Free Educational Options Booklet](#))

Shorted Stock Portfolio

Short Stock Symbol Lookup More

You have not shorted any stocks yet. Learn about short selling from Investopedia's [Short Selling tutorial](#) and view the Simulator How-To Guide's section on [Short Selling](#).

Quotes displayed are delayed by 15 minutes. Market data is provided by [Telvent DTN](#)

Or NeoPets:

Ludwig_van_Underscor

[Customise](#)

Species: **JukJuk**
Health: **10 / 10**
Mood: **content**
Hunger: **bloated**
Age: **0 hours**
Level: **1**

.TN 12 +3 PDSS 9 +0 PEOP 11 +0 POWR 24 +4 SHRX 17 +0 SKBD 323 +52 SKEI 6 +0 SMUG 10 +1 SSS 19 +0 ST

[Home](#) | [Find Stocks](#) | [News/Research](#) | [Profile](#) | [Message Board](#)
[My Portfolio](#) | [Buy](#) | [Help](#)

Your Portfolio
This is a list of all your stocks. If you don't know what any of this means, click on **Help** from the menu above!
To **sell** your stock, click on the triangle to the left of the stock image. More info [here](#).

		Today			Holdings		Overall	
Icon	Ticker	Open	Current Price	Chg	Qty	Paid	Mkt Value	% Change
	SSS (profile)	19	19	0	10	190	190	0.00%
Totals:					10	190	190	0.00%

View the historical value of their portfolio

To some extent, this may be impossible. User-created derivatives are not liquid enough to have a market price that the game can reference. But the value of stocks and cash can be added up to create a total of "liquid assets", which can be plotted over time to show users how their wealth is progressing.

Investopedia has this feature:

Game: Investopedia Game 2011 No End - Performance History

You currently have no Performance History entries for this portfolio.

New entries are added once nightly after the market has closed.

[Download table to Excel](#)

Make a trade

When making a trade, the user should be able to see

- The current price
- Their own current level of cash

Most sites allow you to buy a certain number of "shares", but this is an extra detail and not relevant to managing a portfolio -- what a user cares about is how many dollars of a stock they are buying.

Because users may not know the ticker of the stock they want to buy, something similar to NeoPets "click to list":

Ticker Symbol
(click to list)

Number of Shares

Though more along the lines of "search" than list, since there are more real-world companies than companies in Neopia.

See recent activity by other users

In Investopedia this can be shown individually:

Game: Investopedia Competition (No End) - Trade History

Date	Trade Type	Symbol	Quantity	Target Price	Price	Commission	Total Cash Value	Account Value
9/8/2011 11:46 AM	Stock: Buy at Market	WMT	210000		\$52.61	\$19.99	\$11,047,909.99	\$419,459,949.97
9/8/2011 11:21 AM	Stock: Buy at Market	WMT	360000		\$52.65	\$19.99	\$18,954,019.99	\$418,874,120.49
9/8/2011 10:57 AM	Stock: Buy at Market	WMT	300000		\$52.69	\$19.99	\$15,807,019.99	\$414,324,636.41
9/8/2011 10:33 AM	Stock: Buy at Market	WMT	250000		\$52.59	\$19.99	\$13,147,019.99	\$415,035,957.28
9/7/2011 1:13 PM	Short Stock: Short at Market	TZA	300000		\$43.62	\$19.99	\$13,085,980.01	\$398,717,919.04
9/7/2011 1:11 PM	Option: Sell to Close at Market	SLV1122J41 (SLV 41.00 - Oct 2011)	220		\$2.17	\$404.99	\$47,335.01	\$398,050,437.94
9/7/2011 1:11 PM	Option: Sell to Close at Market	SLV1117I38 (SLV 38.00 - Sep 2011)	115		\$2.61	\$221.24	\$29,793.76	\$398,050,659.18
9/7/2011 11:31 AM	Stock: Buy at Market	WMT	930000		\$52.30	\$19.99	\$48,639,019.99	\$385,103,777.73
9/7/2011 11:28 AM	Stock: Buy at Market	FAS	700000		\$13.33	\$19.99	\$9,329,759.99	\$386,174,739.60
9/7/2011 11:27 AM	Stock: Buy at Market	TRV	80000		\$49.59	\$19.99	\$3,967,219.99	\$386,174,759.59
8/31/2011 4:19 PM	Stock: Buy at Market	TRV	100000		\$50.57	\$19.99	\$5,056,519.99	\$434,692,662.00
8/31/2011 4:11 PM	Stock: Buy at Market	FAS	300000		\$15.50	\$19.99	\$4,650,000.00	\$434,385,636.00

though there does not seem to be a way to view all trades in aggregate.

See rankings of portfolios

Users can see the top players, such as in Investopedia:

Game: Investopedia Competition (No End) - USD Rankings

(*Rankings are evaluated overnight. Following rankings are as on 9/10/2011 7:58:21 PM)
[View All \(USD\)](#) Your Rank (USD): not ranked

Current Rank	Previous day's rank	Account Value (USD)	Today's change in value	Overall%
1. rons922 (history)	1	\$1,325,233,638.68	-\$33,096,650.00	+1325133.64%
2. crazyvcromar (history)	2	\$367,471,581.53	-\$37,757,048.85	+367371.58%
3. Locke11 (history)	3	\$299,316,424.67	-\$75,971,422.90	+299216.42%
4. javier2002 (history)	4	\$240,736,905.63	-\$11,607,888.63	+240636.91%
5. arsko (history)	5	\$50,746,869.91	+\$2,060.00	+50646.87%
6. sedanstock (history)	6	\$41,020,223.53	\$0.00	+40920.22%
7. netraptor (history)	7	\$25,051,238.97	-\$1,017.00	+24951.24%
8. Bellemare (history)	8	\$10,705,596.70	-\$1,282,423.00	+10605.60%
9. michaelwhitlatch (history)	9	\$6,527,026.70	\$0.00	+6427.03%
10. fxenterprise (history)	10	\$6,391,628.96	-\$53,550.00	+6291.63%
11. mechanic101 (history)	11	\$4,380,379.86	\$0.00	+4280.38%
12. flog (history)	12	\$4,136,971.89	-\$50,651.00	+4036.97%
13. musa108 (history)	13	\$3,950,579.07	+\$2,083.45	+3850.58%
14. Peter518 (history)	14	\$3,267,172.70	-\$195,300.00	+3167.17%
15. jose82 (history)	15	\$1,798,182.07	-\$10,748.06	+1698.18%
16. onyx81 (history)	16	\$1,749,749.29	-\$56,537.53	+1649.75%
17. DarkNa (history)	17	\$1,700,443.56	-\$78,920.60	+1600.44%
18. rocky25 (history)	18	\$1,544,059.38	\$0.00	+1444.06%
19. cvokcz02 (history)	19	\$1,411,387.72	-\$116,697.00	+1311.39%

This should add a flavor of competition.

Comment on other users' trades

Comments make users feel involved and part of a community. Such as at StackOverflow:



Neopets has a message board, but this is not as immediately interactive:

Topic/Author	Replies	Last Post
TPP	55	10.09 7:40pm
★ So MYNC went up with every update today, I think. 🍷	5	10.09 7:22pm
🍷 The stock links YOU NEED inside 🍷	70	10.09 7:11pm
So... NAKR predictions?	45	10.09 6:30pm
how do i sell my stocks?	1	10.09 6:10pm
SKBD	0	10.09 6:10pm
★ Help?	3	10.09 5:59pm
🍷 Post Your Ports 🍷	79	10.09 5:21pm

And Investopedia has private messages, but this is still not the same thing:

INBOX (1)

SENT ITEMS

SEND A MESSAGE

To:

Subject:

Message

Send Message

or Cancel

And Investopedia also shows trades by other users, but there is no way to comment:

Game: *Investopedia Competition (No End)* - Trade History

Date	Trade Type	Symbol	Quantity	Target Price	Price	Commission	Total Cash Value	Account Value
9/8/2011 11:46 AM	Stock: Buy at Market	WMT	210000		\$52.61	\$19.99	\$11,047,909.99	\$419,459,949.97
9/8/2011 11:21 AM	Stock: Buy at Market	WMT	360000		\$52.65	\$19.99	\$18,954,019.99	\$418,874,120.49
9/8/2011 10:57 AM	Stock: Buy at Market	WMT	300000		\$52.69	\$19.99	\$15,807,019.99	\$414,324,636.41
9/8/2011 10:33 AM	Stock: Buy at Market	WMT	250000		\$52.59	\$19.99	\$13,147,019.99	\$415,035,957.28
9/7/2011 1:13 PM	Short Stock: Short at Market	TZA	300000		\$43.62	\$19.99	\$13,085,980.01	\$398,717,919.04
9/7/2011 1:11 PM	Option: Sell to Close at Market	SLV1122J41 (SLV 41.00 - Oct 2011)	220		\$2.17	\$404.99	\$47,335.01	\$398,050,437.94
9/7/2011 1:11 PM	Option: Sell to Close at Market	SLV1117I38 (SLV 38.00 - Sep 2011)	115		\$2.61	\$221.24	\$29,793.76	\$398,050,659.18
9/7/2011 11:31 AM	Stock: Buy at Market	WMT	930000		\$52.30	\$19.99	\$48,639,019.99	\$385,103,777.73
9/7/2011 11:28 AM	Stock: Buy at Market	FAS	700000		\$13.33	\$19.99	\$9,329,759.99	\$386,174,739.60
9/7/2011 11:27 AM	Stock: Buy at Market	TRV	80000		\$49.59	\$19.99	\$3,967,219.99	\$386,174,759.59
8/31/2011 4:19 PM	Stock: Buy at Market	TRV	100000		\$50.57	\$19.99	\$5,056,519.99	\$434,692,662.00
8/31/2011 4:11 PM	Stock: Buy at Market	FAS	300000		\$15.50	\$19.99	\$4,650,000.00	\$434,385,658.00

Rate other users' trades

Social Voting

Both over Twitter and on the PitFail website users can rate other users trades with an up or down vote. Votes are anonymous but a score is displayed next to the trade on the main site.

This is similar to features of other websites, such as

Stack Overflow:

How to send 100.000 emails weekly?


▲ On my blog, I have 100.000 subscribers and I want to send them an update email weekly.




-49 How can I do that with PHP ?

▼ [php](#) [email](#) [email-integration](#) [subscription](#) [mailing-list](#)



★ 85 [link](#) | [flag](#)


asked Oct 11 '10 at 11:24

 **xRobot**
2,205 ● 1 ● 8 ● 32
68% acceptance rate

Facebook:


Mike Koval
 Thanks everyone for the birthday wishes! I had a great day.
 Unlike · Comment · July 17 at 2:33pm · 

 You like this.

Designing Securities

Many trading games allow players to trade securities other than stocks, such as options and futures. One way to look at this is that these securities are just *other things with value*, and can be traded exactly like stocks. This is closest to how these securities are traded in the real world.

This is realistic, but it's not terribly interesting for a game. An option has a contract underneath it, and the nature of that contract can become interesting in a real market. PitFail therefore allows users to *design their own contracts*, i.e. create new financial products.

This ability essentially allows users to create a new financial environment. There are a few key aspects:

- In the real world there are courts to enforce contracts, so they can be creative. In PitFail contracts must be simple enough that the software can enforce them.
- Contracts need to be simple enough for users to be comfortable using them, and also fit well into an online game.

We are not aware of any existing websites that implement this feature.

Prediction Market Voting

One option for making voting "count" more, would be to give users a stake in their votes.

As an example, say Alice sells security ABC to Bob for \$100. When they make the trade, each of Alice and Bob set aside a small part (say \$0.50 worth) into two pools, the up-voter pool and the down-voter pool. Voters then purchase a small portion of the pools with their votes.

This has a few consequences:

- It becomes possible to rate the accuracy of a user's votes based on how much cash they make from voting. This can act as a status symbol.
- It gives users an incentive to vote.

We are not aware of any existing websites that implement this feature.

Teams + Leagues

Although there is a global "PitFail Universe", some users are going to want to play in smaller groups. To this end we introduce Teams and Leagues.

Teams

A team is a group of users who share a portfolio, and all are free to trade using this portfolio. There is no "leader" and no set decision making process.

Leagues

A league is a group of users who compete together. Typically a league will be created for a particular game session, then users will join, each starting with the same portfolio. There will be rankings and winners within a League.