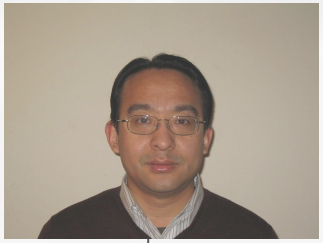
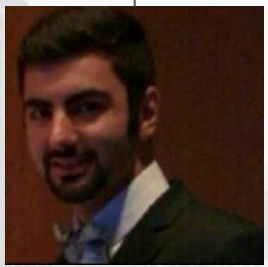
Common Wealth Hedge Fund

Company Structure

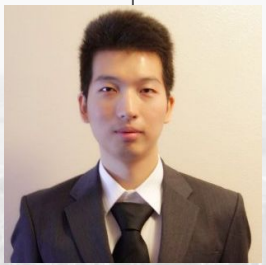


CEO (Xugong Li)

Data Specialist
YuXuan Xia



COO
Arya Nasir Tafreshi



System Architect
Xiao'Ao Song

Portfolio Manager:
Zi Lang Wong

Long Short Strategy

Investment Universe: NASDAQ100

Strategy Objective:

1. Capture alpha in NASDAQ100 constituents based on fundamental value factors
2. Eliminate systematic risk
    a. Achieve 0 beta portfolio to eliminate market risk
    b. Possessed both Long and Short stocks eliminate market movement risk
    c. Financial Crisis 2001, 2008, 2011

Long Short Strategy

Investment Philosophy:

1. Belief of that there are some relationships between guru analysis and stock performance
2. Long top ranked securities/Short bottom ranked securities
3. Eliminating Systematic Risk (aka Market risk) is the key to avoid significant loss during catastrophic events and generate consistent profits

Long Short Strategy

Performance Analysis:

- Strategy VS NASDAQ100
- Daily Basis

Rebalancing:

- Monthly Basis

Cash Flow Management:

- Target less than 1% Cash

Long Short Strategy

Bird View Algorithm:

1) Obtain factors data from NASDAQ
2) Rank the universe NASDAQ100 based on the factors
3) Long Top Ranked Stocks/Short Bottom Ranked Stocks
4) Generate Trading Orders
5) Rebalance the Portfolio
6) Keep track Daily Performance

Results

Inputs: 

Outputs:

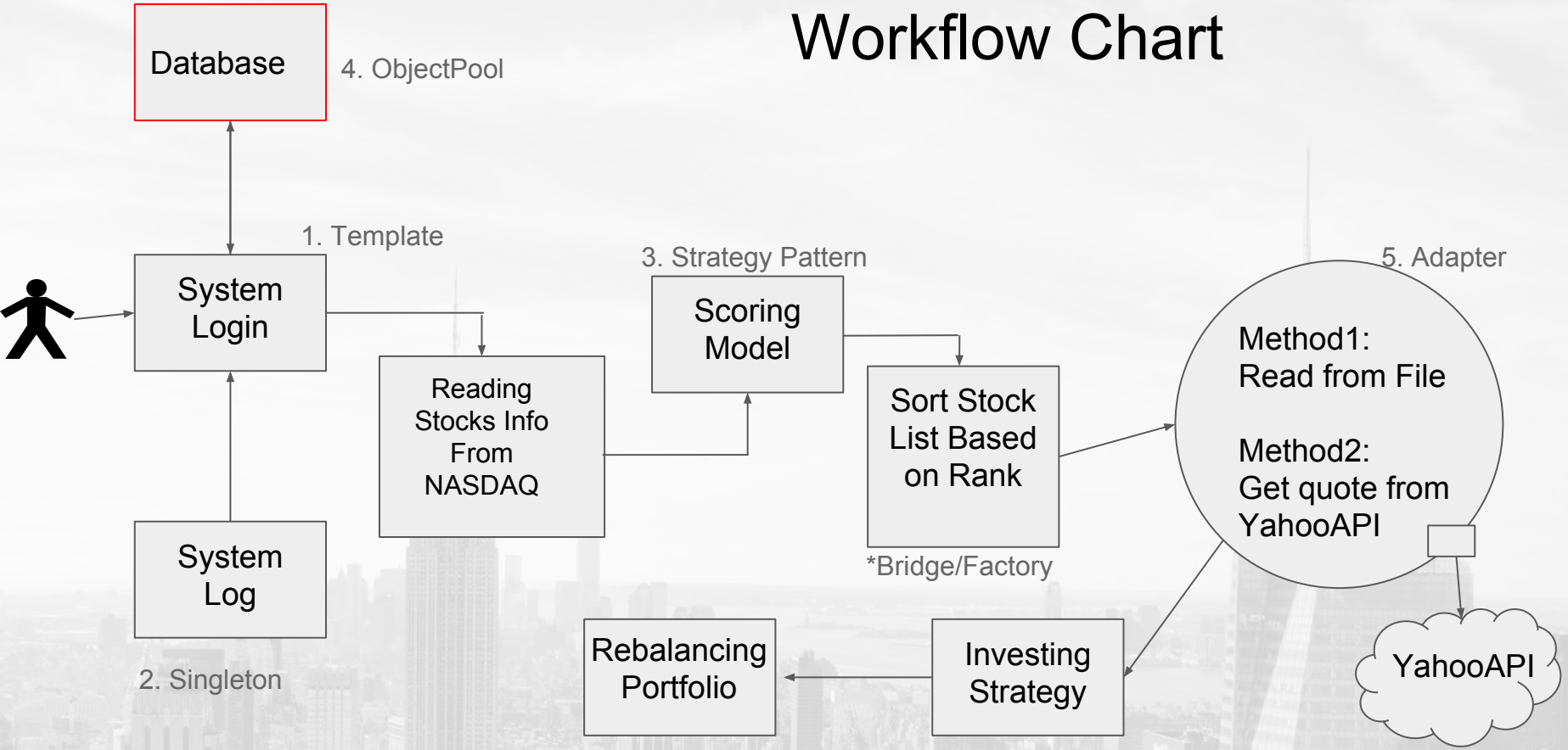
1) Portfolio Profit and Loss based on the strategy
2) Limit Order Book
   a) Example: Order to be executed in April

aaon	-99
abmd	-137
avhi	23
flws	16
jobs	37
srce	-205

System Environment and Support

- Programming Language: C++, python, hadoop
- C++ version: C11
- HDFS versoin: hadoop v2.6 (for 2nd phrase)
- System Architecture: C/S
- Operation System: Windows, Linux(boost library supported)
- Connection: Yahoo API
- Strategy scalability: ScoringStrategy(INTF) InvestingStrategy(INTF)

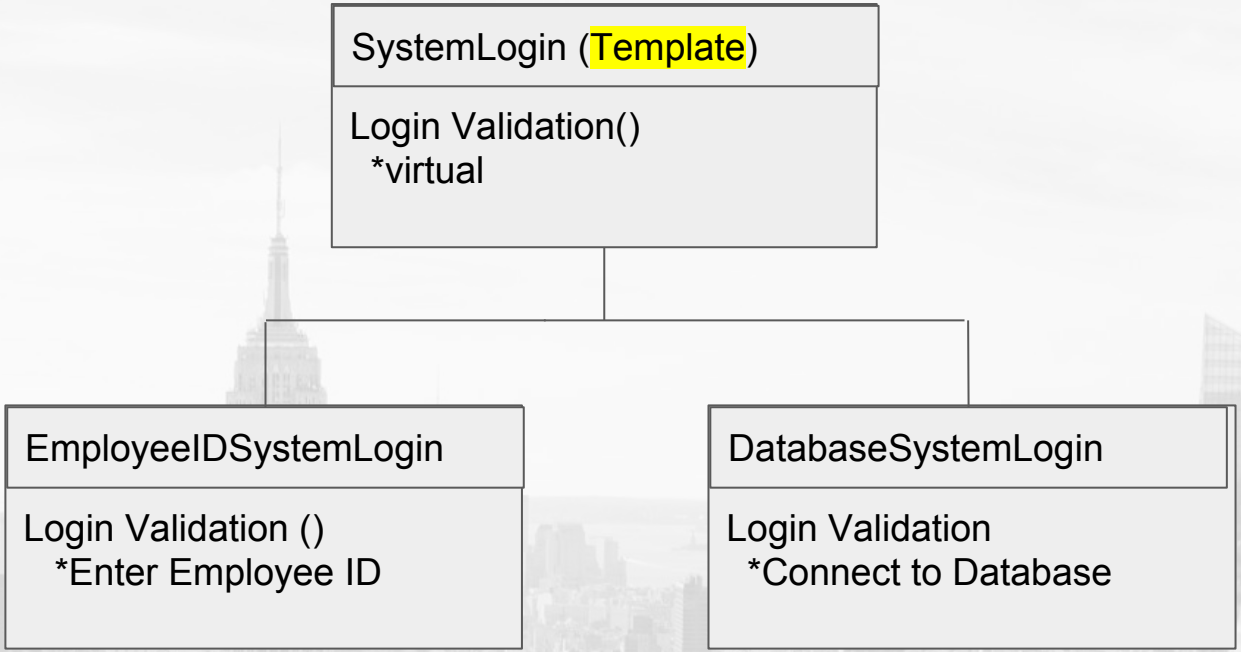
Workflow Chart



Design Patterns

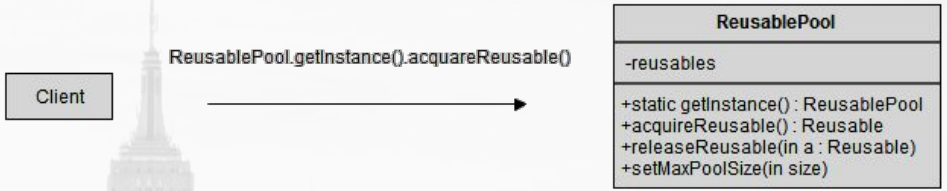
- Template (-> System Login Module)
- Strategy (-> Scoring Strategy; Investing Strategy)
- Singleton (-> SystemLog)
- ObjectPool (-> DBConnection Module)
- Adapter (-> Yahoo API)
- *Factory (for 2nd phrase)
- *Bridge (for 2nd phrase)

Template Method

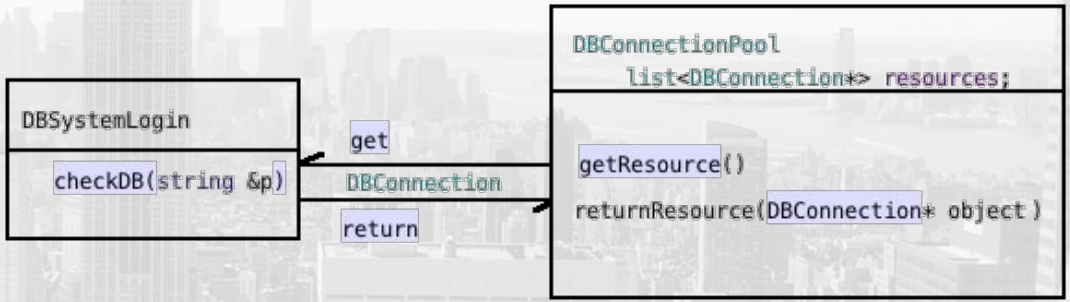


Object Pool

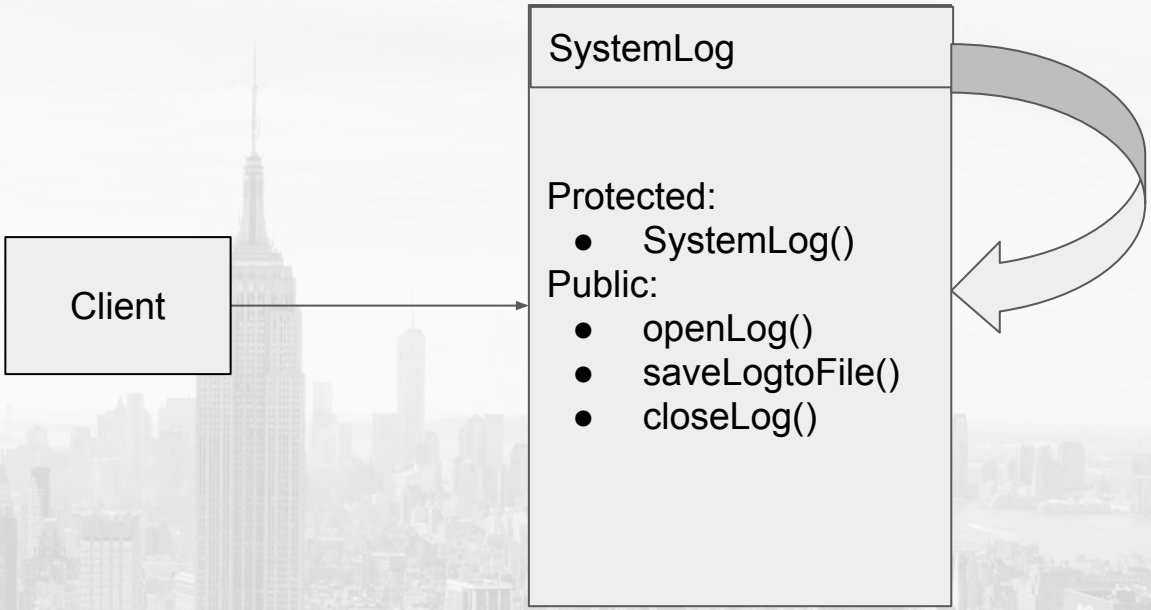
Object pooling can offer a significant performance boost; it is most effective in situations where the cost of initializing a class instance is high, the rate of instantiation of a class is high.



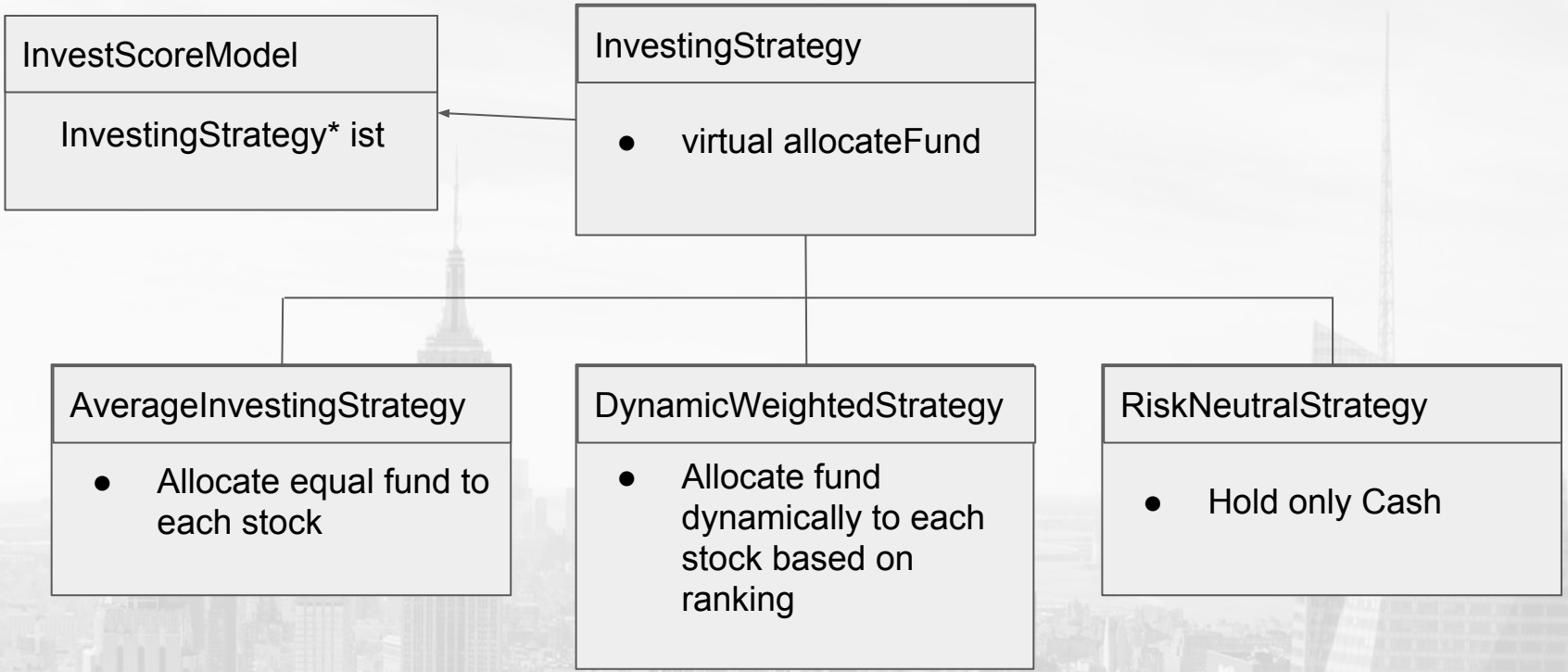
Sample Code:



Singleton（Lazy Instantiation）



Strategy Method



Strategy Method Code Example

```
class InvestingStrategy  {
    public:
    const double totalWealth = 10000;
    virtual map<string, int> StockInvestingStrategy(vector<string> & vector)=0;
};


#endif //FINALPROJ_INVESTINGSTRATEGY_H
```

```
#include "InvestingStrategy.h"

class AVGInvestingStrategy: public InvestingStrategy {
public:
//    map<string, double> & StockScoringStrategy(vector<string> &vector) override;
    map<string, int>  StockInvestingStrategy(vector<string> &vector) override;
//    double StockScoringStrategy(vector<string> &vector) override;

};
```

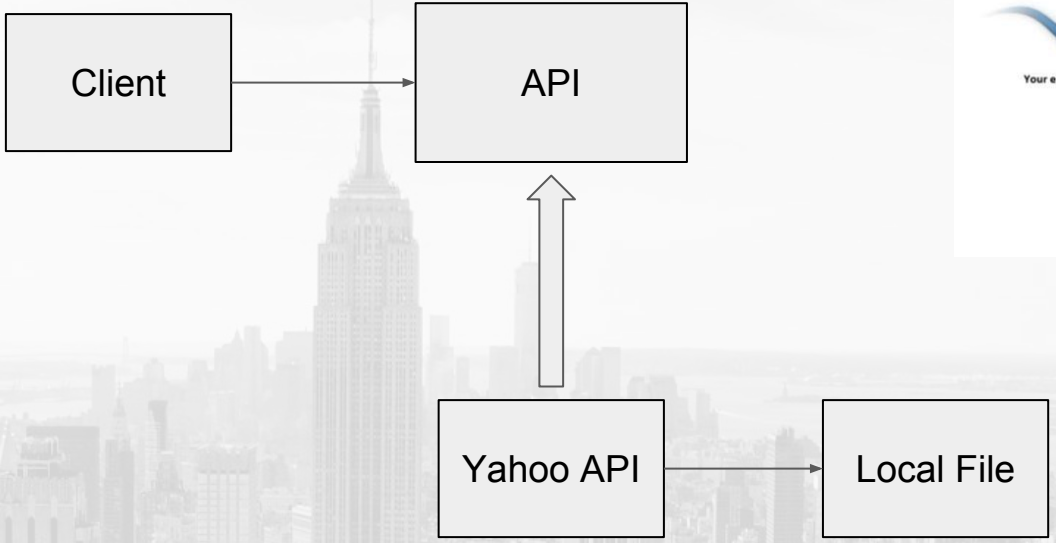
RiskNeutralStrategy

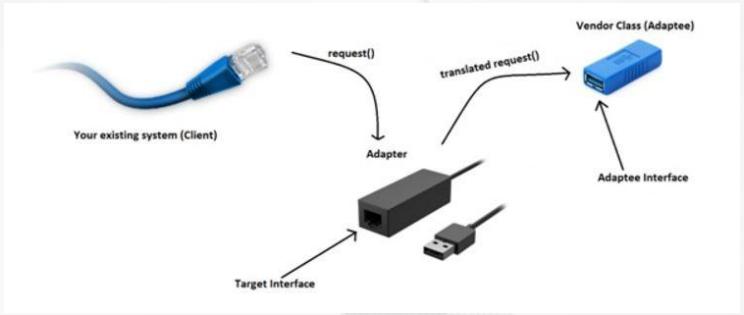
- Hold only Cash

DynamicWeightedStrategy

- Allocate fund dynamically to each stock based on ranking

Adapter Pattern





Pricing Data and Portfolio Allocations

Yahoo Finance Data:

http://finance.yahoo.com/d/quotes.csv?s=GE+PTR+MSFT&f= snd1l1yr

Invest 1M in our portfolio --->divided equally for each stocks.

Stock proportion / stock price = Number of shares to hold.

```
The list to be invested in long basket
"AMZN"->937.53
"GOOG"->931.66
"GOOGL"->954.72
"PCLN"->1910.41
number of shares for each stocks
"AMZN"->53
"GOOG"->53
"GOOGL"->52
"PCLN"->26
```

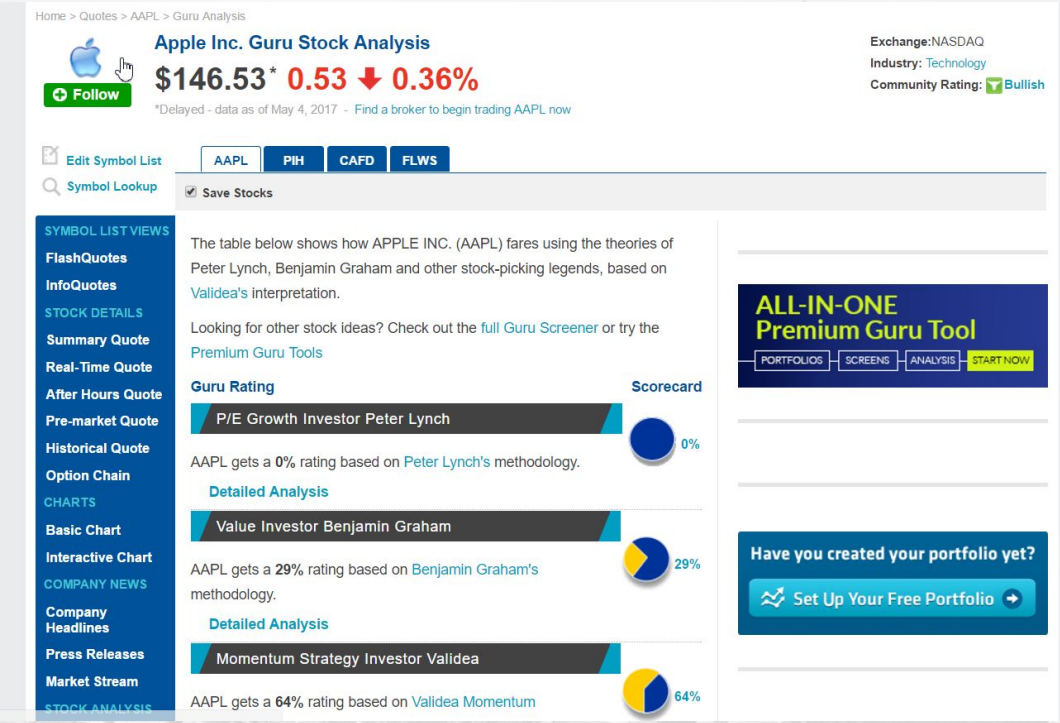
a	Ask	a2	Average Daily Volume	a5	Ask Size
b	Bid	b2	Ask (Real-time)	b3	Bid (Real-time)
b4	Book Value	b6	Bid Size	c	Change & Percent Change
c1	Change	c3	Commission	c6	Change (Real-time)
c8	After Hours Change (Real-time)	d	Dividend/Share	d1	Last Trade Date
d2	Trade Date	e	Earnings/Share	e1	Error Indication (returned for symbol changed / invalid)
e7	EPS Estimate Current Year	e8	EPS Estimate Next Year	e9	EPS Estimate Next Quarter
f6	Float Shares	g	Day's Low	h	Day's High
j	52-week Low	k	52-week High	g1	Holdings Gain Percent
g3	Annualized Gain	g4	Holdings Gain	g5	Holdings Gain Percent (Real-time)
g6	Holdings Gain (Real-time)	i	More Info	i5	Order Book (Real-time)
j1	Market Capitalization	j3	Market Cap (Real-time)	j4	EBITDA
j5	Change From 52-week Low	j6	Percent Change From 52-week Low	k1	Last Trade (Real-time) With Time

Factor Analysis: DATA ETL Process

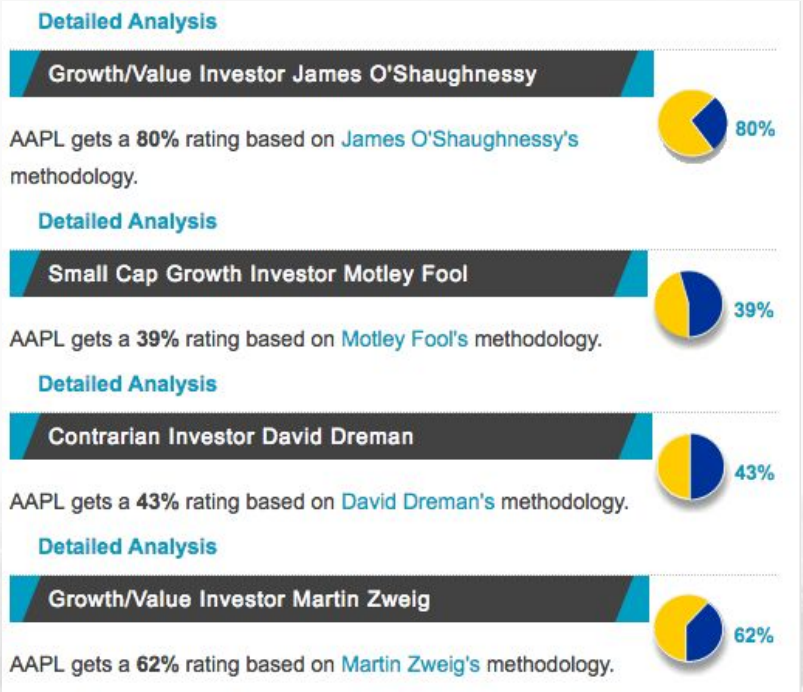
Source: NASDAQ

Method: Scraping

Framework: Scrapy(Python)

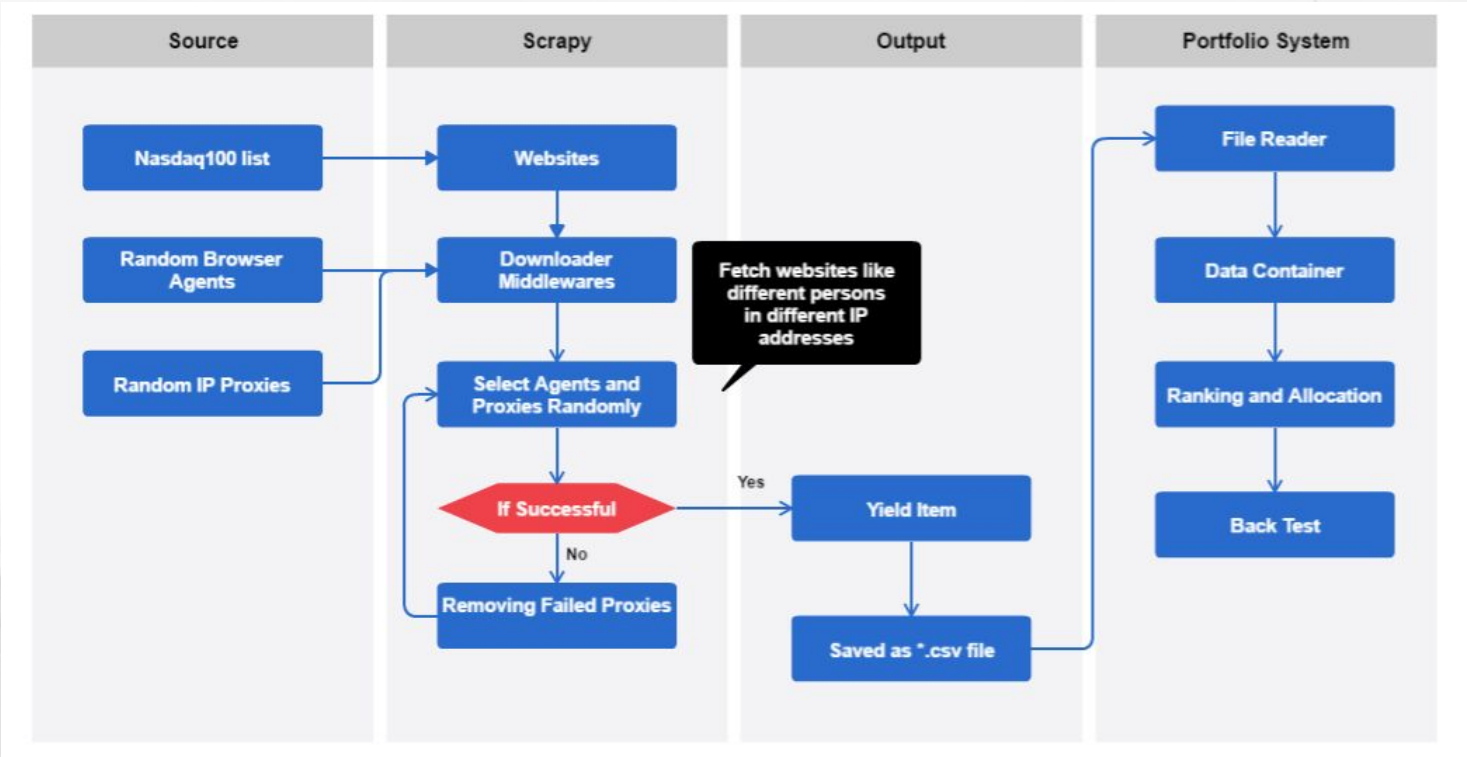


Guru Stock Analysis




```
In [14]: response.xpath("//a[@href]/b/text()")
Out[14]:
[<Selector xpath='//a[@href]/b/text()' data='0%'>,
 <Selector xpath='//a[@href]/b/text()' data='29%'>,
 <Selector xpath='//a[@href]/b/text()' data='64%'>,
 <Selector xpath='//a[@href]/b/text()' data='80%'>,
 <Selector xpath='//a[@href]/b/text()' data='39%'>,
 <Selector xpath='//a[@href]/b/text()' data='43%'>,
 <Selector xpath='//a[@href]/b/text()' data='62%'>,
 <Selector xpath='//a[@href]/b/text()' data='10%'>]
```

Web Crawling Flow Chart



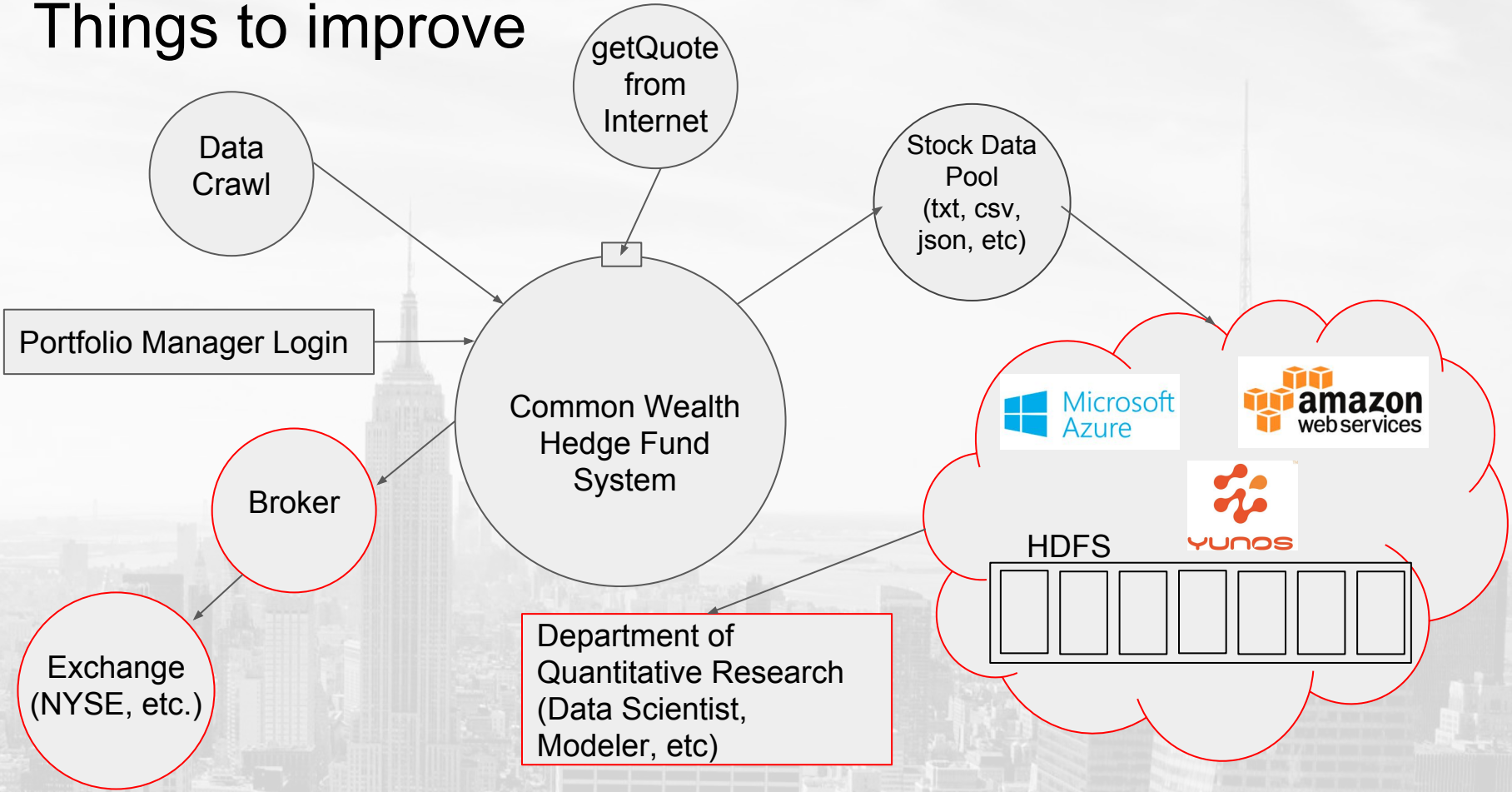
About Crawler

```
2017-05-05 13:16:35 [scrapy.downloadermiddlewares.retry] DEBUG: Retrying <GET http://www.n
asdaq.com/symbol/foxa/guru-analysis> (failed 30 times): 400 Bad Request
2017-05-05 13:16:35 [scrapy.downloadermiddlewares.retry] DEBUG: Retrying <GET http://www.n
asdaq.com/symbol/TSCO/guru-analysis> (failed 46 times): 400 Bad Request
2017-05-05 13:16:35 [scrapy.proxies] INFO: **********************using agency: Mozilla/5.
0 (Windows; U; Windows NT 5.1; zh-CN; rv:1.9) Gecko/20080705 Firefox/3.0 Kapiko/3.0

2017-05-05 13:16:36 [scrapy.proxies] INFO: **********************using agency: Mozilla/5.
0 (Windows; U; MSIE 9.0; Windows NT 9.0; en-US)

2017-05-05 13:16:36 [scrapy.core.engine] DEBUG: Crawled (200) <GET http://www.nasdaq.com/s
ymbol/ulta/guru-analysis> (referer: None)
2017-05-05 13:16:36 [scrapy.core.scraper] DEBUG: Scraped from <200 http://www.nasdaq.com/s
ymbol/tmus/guru-analysis>
{'PE_growth_PL': 56,
 'contrarian_DD': 57,
 'growth_value_JO': 100,
 'growth_value_MZ': 62,
 'momentum_strategy_V': 64,
 'price_sale_KF': 50,
 'small_cap_growth_MF': 52,
 'symbol': 'tmus',
 'value_BG': 29}
```

Github:ttps://github.com/jerryxyx/Crawlers

Business Structure

Things to improve




Thank You!