RUTGERS
THE STATE UNIVERSITY
OF NEW JERSEY

Web Based Stock Forecaster

Group 2
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Contribution Breakdown

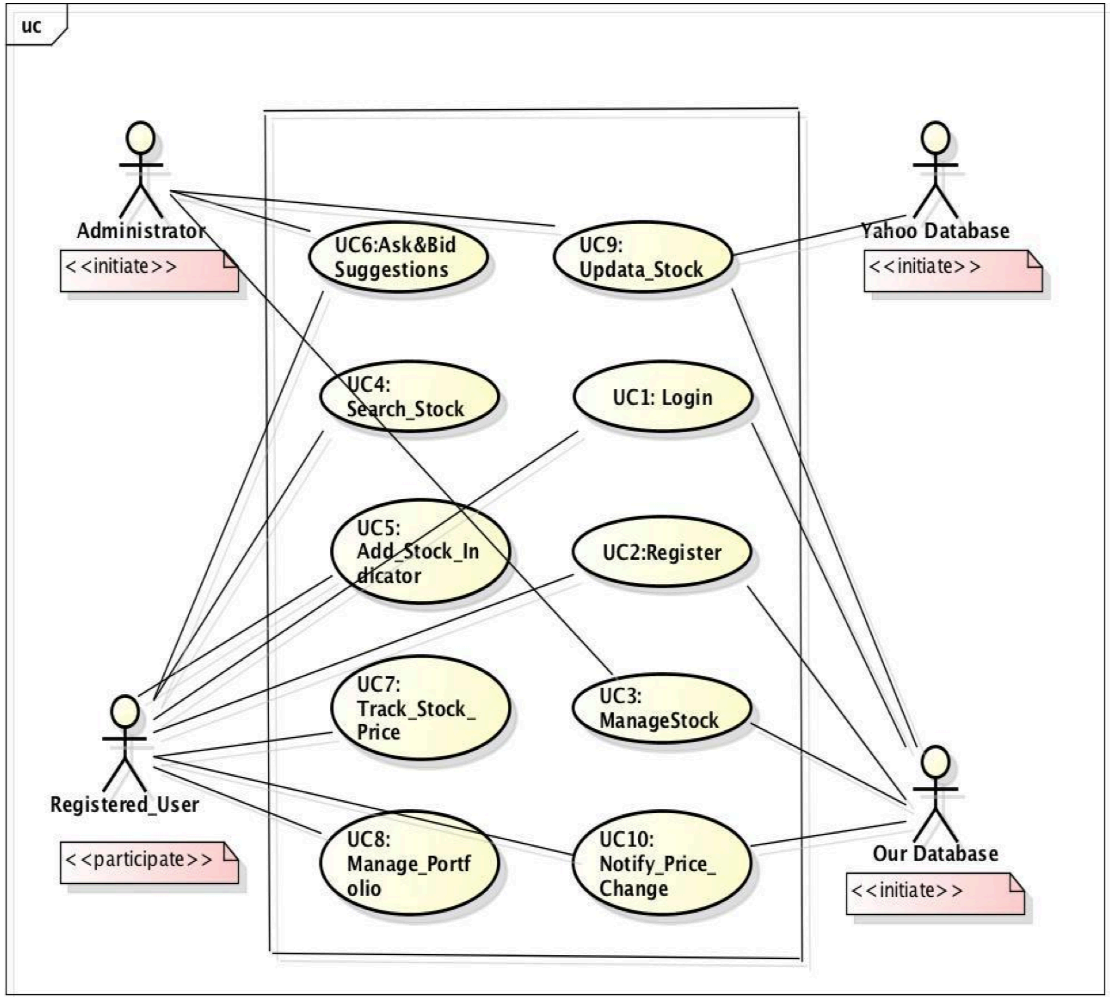
	Chaoran Fu	Kai Kang	Yu Sun	Yue Wu	Wuyang Zhang
Extract Data	20%	20%	20%	20%	20%
Retrieve Data	20%	20%	20%	20%	20%
Build Database	20%	20%	20%	20%	20%
Short-term Predict	20%	20%	20%	20%	20%
Long-term Predict	20%	20%	20%	20%	20%
Algorithm Implementation	20%	20%	20%	20%	20%
Web Interface	20%	20%	20%	20%	20%

General Background

- Yahoo finance is a pretty good tool to display the historical and real-time price for each targeted stock, but it cannot predict price.

- Our system can predict stock price and give the user advice of whether should buy, hold or sell the targeted stock.

Use Case



UC-1: Login

UC-2: Register

UC-3: Manage Stock

UC-4: Search Stock

UC-5: Add Stock Indicator

UC-6: Suggest Ask or Bid

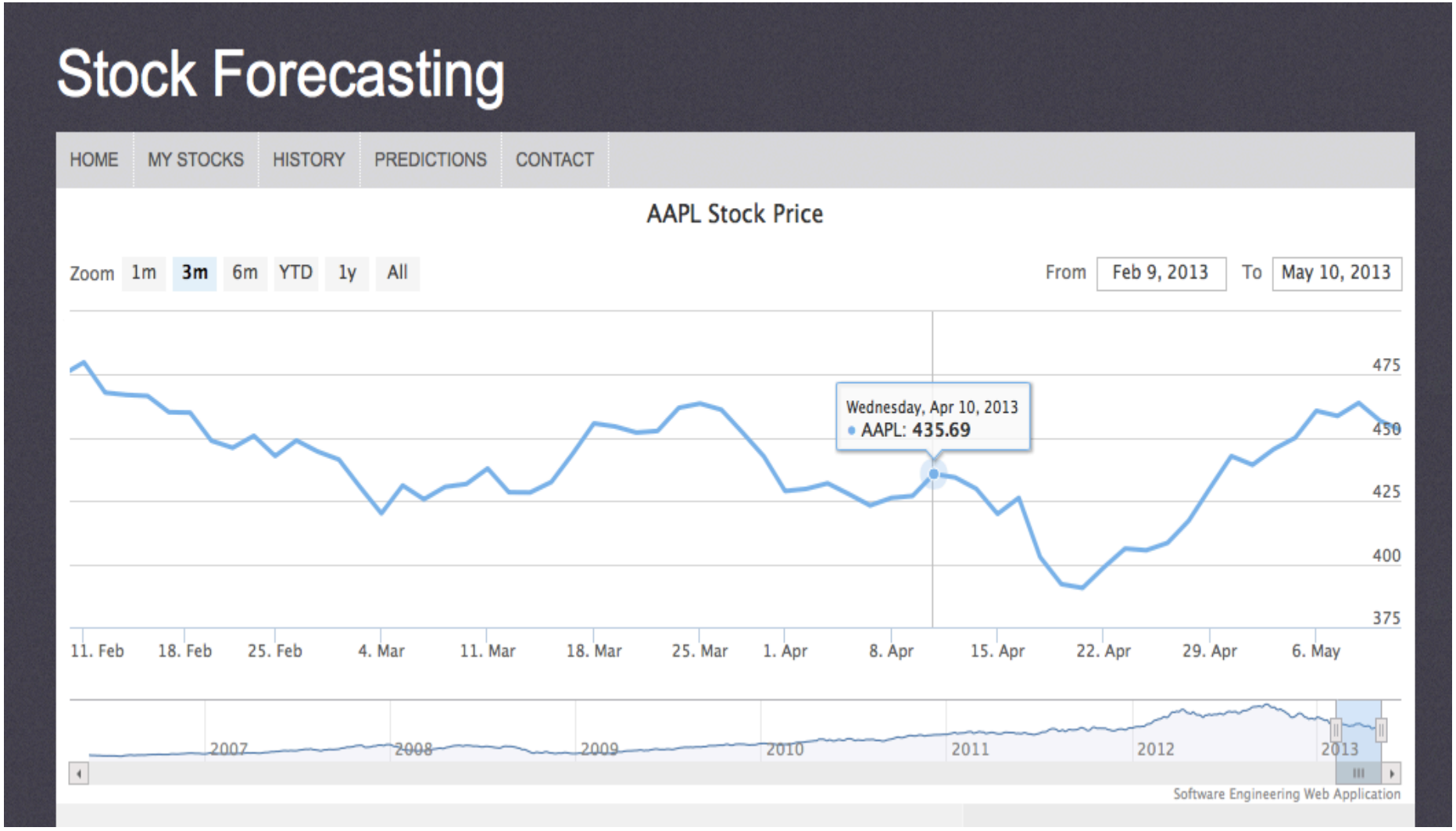
UC-7: Track Stock Price

UC-8: Manage Portfolio

UC-9: Update Stock Price

UC-10: Notify Price Change

Web Service Interface



Web Service Interface

System Design

The key point for the stock forecasting system design is to receive user's order, retrieving and processing data, and then send the processed data back to user. In this case, we need to design eight parts to complete the task. First, we decide to design two end points application, one for the web and one for the phone app. This is because stock market is changing at every moment, one minute may result in a huge turnover, therefore, to make the market information accessible for our customers in every place and every time is important, so design another mobile application is necessary.

Both endpoints may have the capability to display basic stock information, and let the user to register and log in to view some particular stock and information he or she may interested in. Besides, the application should have the ability to remember user's preference, so every time user log in, the application will display the most important information that the user want to see.

Services

Long term and short term predictions.

Investment portfolio.

News & Events

Nutritionists warn diners to be wary of Warren Buffett's 'junk-food' portfolio.

Oil prices surge after Saudi air strikes in Yemen.

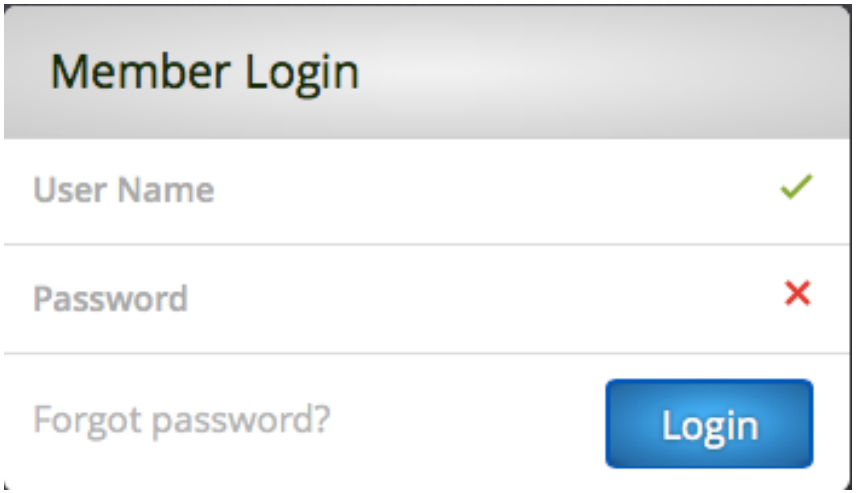
Republicans need new economic ideas if they want to win in 2016.

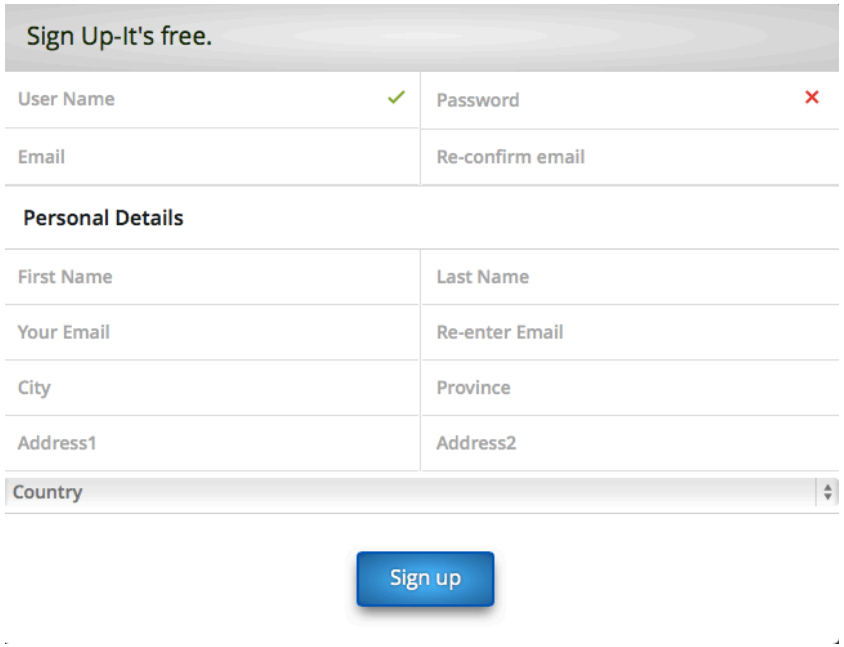
IPO market shrivels as tech companies stay private.

Move aside payday lenders — we found an even worse way to borrow money.

Social Security will barely cover your health costs.

Web Service Interface





Prediction Strategy/ Indicator -- SMA

Formula: $SMA = (C1 + C2 + C3 .... + Cn) / n$

Reason: Short-term averages respond quickly to changes in the price of the underlying

What we have achieved:

Selecting successfully
the size of sma is: 265
79.246
79.432
79.234
78.664
78.094
77.474
76.74
76.158
75.854
75.622
75.368
75.244
75.068
75.11
75.22
75.508
75.986
76.108
76.184
76.686

Indicator-- EMA

Formula: $EMA_{Today} = \alpha * \Pr ice_{Today} + (1-\alpha) * EMA_{yesterday}$

Reason: EMAs are used as signals of long-term trends

What we have achieved:

Selecting successfully

68.641399176955
68.927818930041
68.895555555556
68.008024691358
67.095061728395
66.515967078189
66.24670781893
66.181604938272
65.817160493827
65.3729218107
65.080617283951
65.244238683128
65.347695473251
65.397942386831
65.327695473251
65.58621399177
66.405185185185
66.363621399177
66.192674897119
66.670041152263

Indicator -- MFI

Formula:

1. Typical Price = (High + Low + Close)/3
2. Raw Money Flow = Typical Price x Volume
3. Money Flow Ratio = (14-period Positive Money Flow)/(14-period Negative Money Flow)
4. Money Flow Index = 100 - 100/(1 + Money Flow Ratio)

Reason:

The Money Flow Index (MFI) is best suited to identify reversals and price extremes with a variety of signals

What we have achieved:

Selecting successfully
64.31545566563
62.368360020832
55.349788888113
62.231763586982
71.268093943037
71.613041009612
72.733301427473
74.883338332811
75.855487463949
70.895576826899
70.930269040186
71.11820957492
71.817891272528
76.181804728907
70.973384833011
64.371805177224
69.524792180858
63.546977498305
56.846890838561
48.893767510399

Indicator -- MACD

Formula:

DIF=EMA (close, 12)-EMA(close, 26)

Signal line: DIF=EMA(close, 9)

Reason:

When the MACD falls below the signal line, it is a bearish signal, which indicates that it may be time to sell.

What we have achieved:

Selecting successfully

-1.1610290249484
-0.82481936150351
-0.53909942172899
-0.28563451442599
0.13444547354439
0.53306526538711
0.5619011372403
0.68757969640453
0.83256640238933
0.67940242379754
0.47937466373345
0.31026436149861
0.18412835551847
0.068592439988848
0.15841018592272
0.58923833367896
0.71498459886574
0.8256721478341
0.88671416846466
0.87710482459295

Indicator – Relative Strength Index (RSI)

Formula:

RSI = 100 - 100/(1+RS)

RS = average of x days' up close / average of x days' down closes

Function:

RSI compares the magnitude of recent gains to recent losses in an attempt to determine overbought and oversold conditions.

Indicator – Stochastic

Formula:

%K = 100[(C-L)/(H-L)]

C = the most recent closing price
L = the lowest price during given period
H = the highest price during given period

Function

This indicator compares a security's closing price to its price range over a given period in an attempt to determine overbought and oversold conditions.

Indicator – Bollinger bands

Formula:

Middle Band = 20-day simple moving average (SMA)

Upper Band = 20-day SMA + (20-day standard deviation of price x 2)
Lower Band = 20-day SMA - (20-day standard deviation of price x 2)

Function:

This indicator calculates deviation range. When the markets become more unstable the bands widen (move further away from the average) and during less unstable periods, the bands contract(move closer to the average).

Web Sources

Current Price:
http://download.finance.yahoo.com/d/quotes.csv?s=

History Price:
http://ichart.yahoo.com/table.csv?s=

Archived Tasks

- Extract data from Yahoo finance
- Store into our database
- Calculate 4 indicators and plot them by chart
- Set up a web interface frame

Plan of Work

Task Name	Duration	Start	Finish
Query Stock Information	20	02/16/15	03/13/15
Build Database	15	02/16/15	03/06/15
Comparing Different Indicators	20	03/09/15	04/03/15
Implement Prediction Algorithms	20	03/16/15	04/10/15
Build Website and Mobile Application	25	03/16/15	04/17/15