FRE 6883 Financial Computing
Team Project

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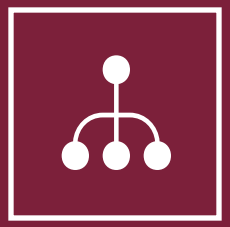
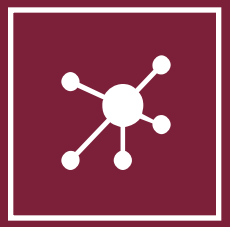




01 Introduction

Work Assignment

Data Processing

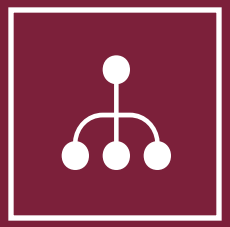
- Retrieve data from Yahoo Finance and Blomberg terminal

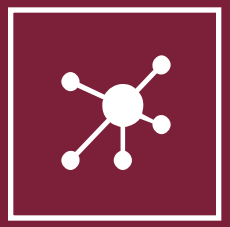
Calculation

- Implement Bootstrapping

Visualization

- Create menu of 5 options
- Output graph





02 Design and Implementation

Project Design

Download and Clean Data	
import.h	class CSVReader
Retrieve.h	int GetStock()
	int GetIWB()
Categorize.h	void datacheck()
	void categorize()

StockMap<string, struct>

Calculate and Bootstrap	
Calculate.h	class Calculation
	+AAR()
	+CAAR()
CalFunction.h	Operator Overloading
	matrix R()
	matrix AR()
	matrix Randomselect()
	vector<double> average()
	matrix Boot()

StockMap<string, struct>

Visualization	
TestPrintInExcel.h	Vector<double, long> DVector(vector<double> v);
	int TestPrintInExcel()
swtich()	case1: retrieve data
	case2: pull information for one stock
	case3: show AAR and CAAR for one group
	case4: Show the graph and chart
	case5: Exit the program

Data Processing

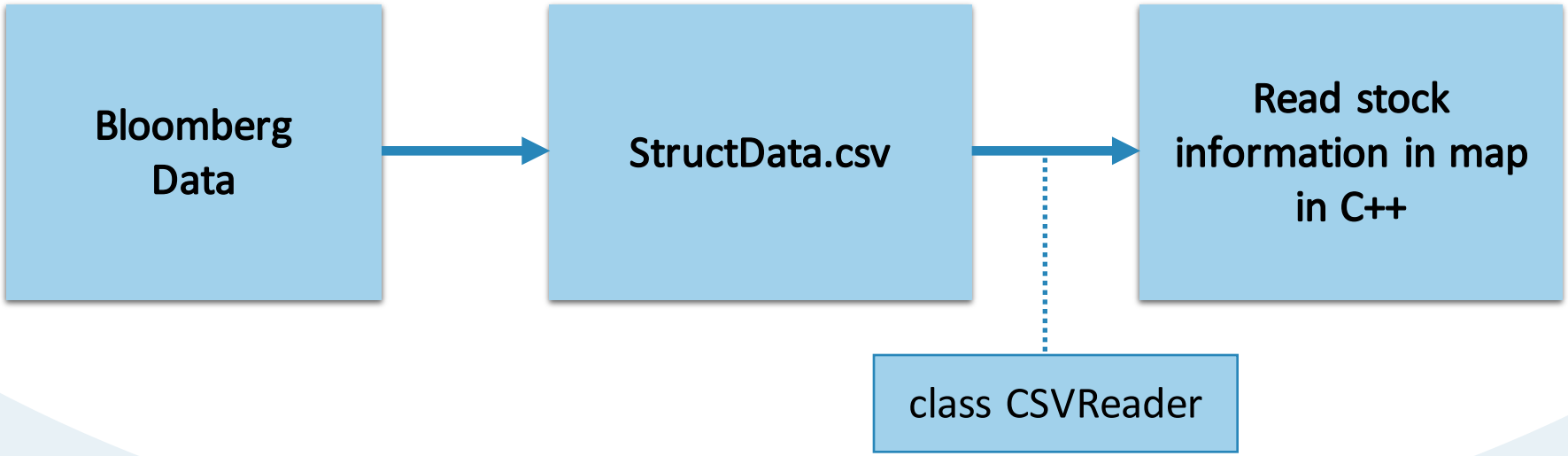
- Download earnings data from Bloomberg terminal
- Read it to C++
- Retrieve historical data from yahoo finance
- Data cleaning

Process Bloomberg Query

- Get rid of NULL values (i.e., the stocks without actual EPS or Estimate EPS) in Excel
- Sort the stocks according to the Surprise (given by Bloomberg terminal)
- According to 1/3 and 2/3 percentile, we categorized the stocks (1% and 7%)
- Calculated the StartTime and EndTime using workday function (holidays taken into account)

Ticker	Date	Date Type	Time	ET	Period	Actual	Actual Source	Estimate	Surprise
DCI US	3/1/2017	C	07:00	ER	Q2 17	0.35	Adjusted	0.314	11.50
NTNX US	3/2/2017	C	16:14	ER	Q2 17	(0.28)	Adjusted	(0.353)	20.70
COST US	3/2/2017	C	16:15	ER	Q2 17	1.17	Adjusted	1.351	(13.50)
GWRE US	3/2/2017	C	16:15	ER	Q2 17	0.28	Adjusted	0.142	97.20
THO US	3/6/2017	C	16:15	ER	Q2 17	1.23	Adjusted	1.216	1.00

Download earnings data from Bloomberg terminal



Read stock information in map in C++

Map Stock	
Ticker	struct stock
…	…
…	…
…	…

start date;
end date;
announcement date;
group;
actual EPS;
estimate EPS;
surprise;
Date vector;
Price vector;

Computing

- Operator overloading
- Calculate ARR and CAAR
- Bootstrap

Retrieve Data from Yahoo Finance and Clean Data

- Retrieve Data from Yahoo Finance —— GetStock()
- Categorize and Clean Data —— categorize()

Note: outliers is stocks whose prices is zero or size is less than 241

Calculate AAR and CAAR

- Calculate returns: matrix R(matrix &type)
- Calculate abnormal returns: matrix AR(matrix RS, matrix RIWB)
- Randomly select: matrix Randomselect(matrix AR)
- Caculate AAR: vector<double> Calculation::AAR()
- Caculate AAR: vector<double> Calculation::CAAR()

Bootstrap

- Use a for loop and Randomselect function to do bootstrap
- Each time randomly select 100 stocks from each group
- Construct an object of class Calculation with this AR matrix
- Call member function to calculate AAR and CAAR
- Use moving average to calculate average AAR and CAAR

Visualization

- Plot CAAR of three group and present the AAR and CAAR for 3 groups in a chart
- Create a menu of 5 options

Plot and Chart

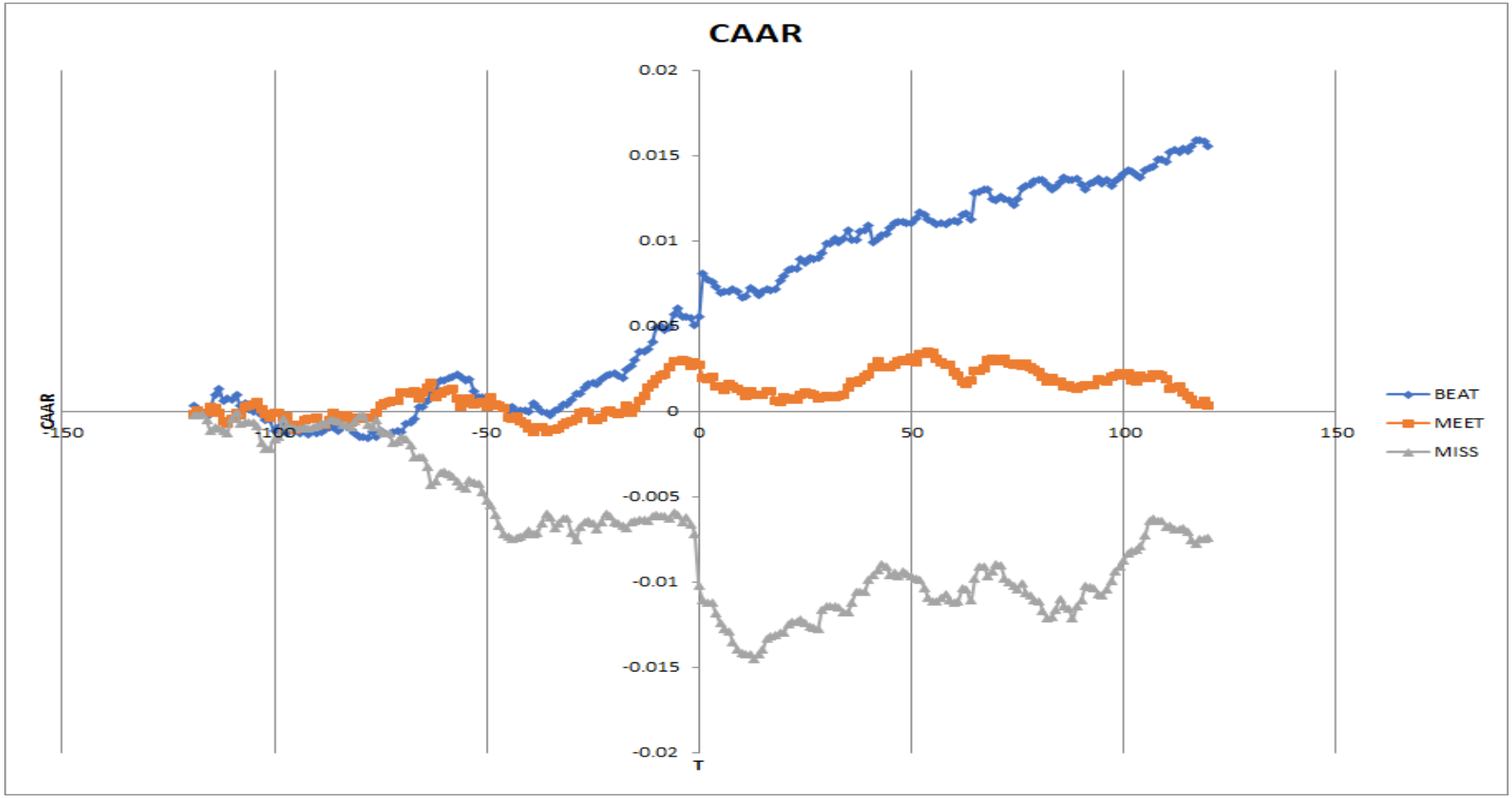
- Change STL vector to Daniel Vector: Vector<double, long> DVector(vector<double> v)
- Plot and Chart: TestPrintInExcel(aveCAAR_BEAT, aveCAAR_MEET, aveCAAR_MISS, aveAAR_BEAT, aveAAR_MEET, aveAAR_MISS);

Create Menu

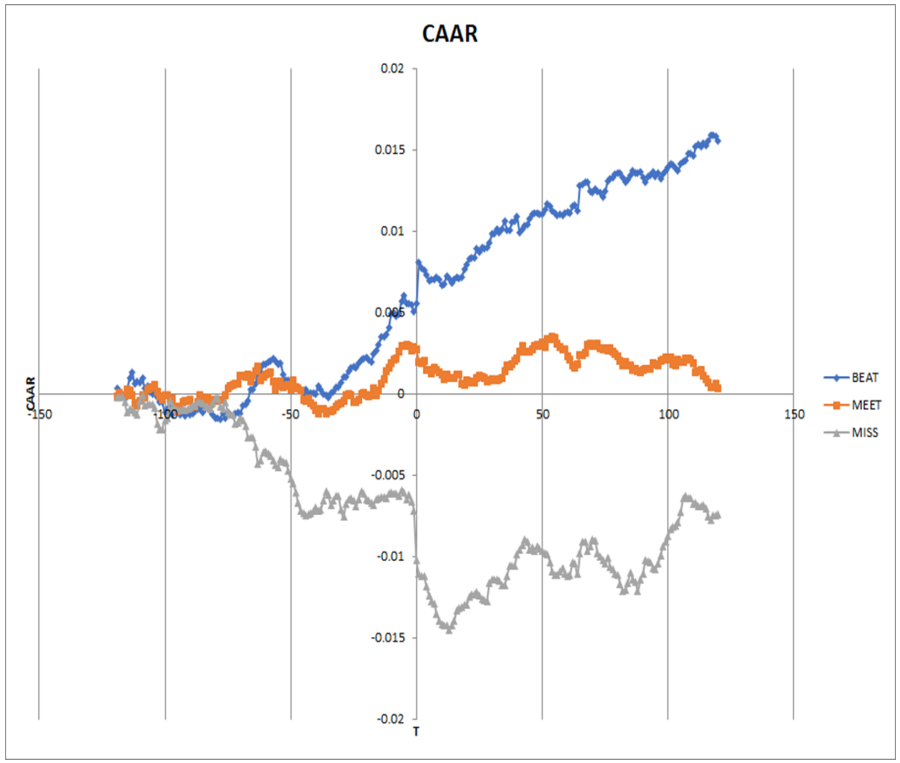
- 1. Download data from Bloomberg and retrieve data from yahoo finance
- 2. Pull information for one stock from one group
- 3. Show AAR or CAAR for one group in CMD
- 4. Show the Excel graph with CAAR for all 3 groups and chart of AAR and CAAR
- 5. Exit our program

03 Conclusion

CAAR


CAAR
0.02
0.015
0.01
0.005
0
-0.005
-0.01
-0.015
-0.02
-150
-100
-50
0
50
100
150
CAAR
T
BEAT
MEET
MISS

Conclusion



The releasing of the earnings do has an impact on the stock price.

The difference of CAAR among the three groups has been widen greatly after the announcement.

The impact of Earnings Surprise on Beat is less than Miss.

Enhancement

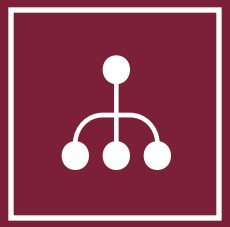
- Put the sCookies and sCrumb outside while loop (cut the time for retrieving data)
- Menu Design: Took care of the wrong input situation; user-friendly

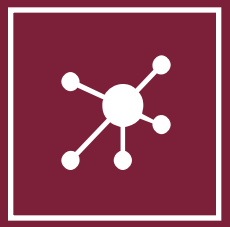
Reference

Song Tang, FRE_GY 6883 Financial Computing Course Team Projects.

Bloomberg. Bloomberg Professional. (2017)[Online]. Available at: Subscription Service (Accessed: 28 November 2017).

Prata, Stephen. C++ primer plus. Sams Publishing, 2002.





THANK
YOU