

Project 2

Math 567

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1 Introduction

Say something about stock plotting here?

What is time series analysis? What is correlation? What are linear regression models?

Why is it useful, why do people do it? What reasons would we have for plotting closing prices?

1.1 Apple

Say something about apple stocks here.

1.2 Microsoft

Say something about Microsoft stocks here.

2 Methods

Describe data source: yahoo. Describe how we use 6 month intervals. Describe R environment. Describe methods we used to make graphs Describe method we used to make Time Series Analysis Describe method we use to do Correlation Describe method we use to do Regression

3 Results and Analysis

3.1 Overview

3.1.1 Apple overview Plots

Discuss

3.1.2 Microsoft overview Plots

Discuss

3.1.3 Superimposed ms and apple

Discuss

3.1.4 Correlation

Discuss correlation overall. Show additional correlation data such as with the index and with gold and oil and other commodities.

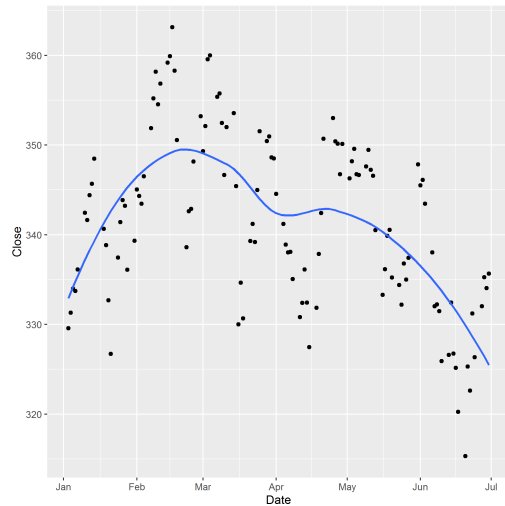


Figure 3.1: Scatter plot with graph of Apple stock

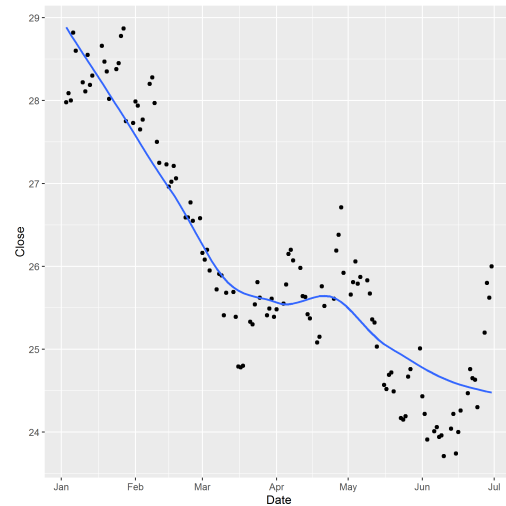


Figure 3.2: Scatter plot with graph of Microsoft stock

3.2 January - June 2011

3.2.1 Plots

Discuss apple chart Discuss Microsoft chart

3.2.2 Correlation

Insert correlation table MS vs apple Discuss any interesting overall observations here

3.2.3 Regression

Show regression lines for MS and apple.

Discuss regression lines.

List y intercept, slope overall.

3.2.4 Analysis

Discuss any interesting overall observations here

3.3 July - December 2011

3.3.1 Plots

Discuss apple chart Discuss Microsoft chart

3.3.2 Correlation

Insert correlation table MS vs apple Discuss any interesting overall observations here

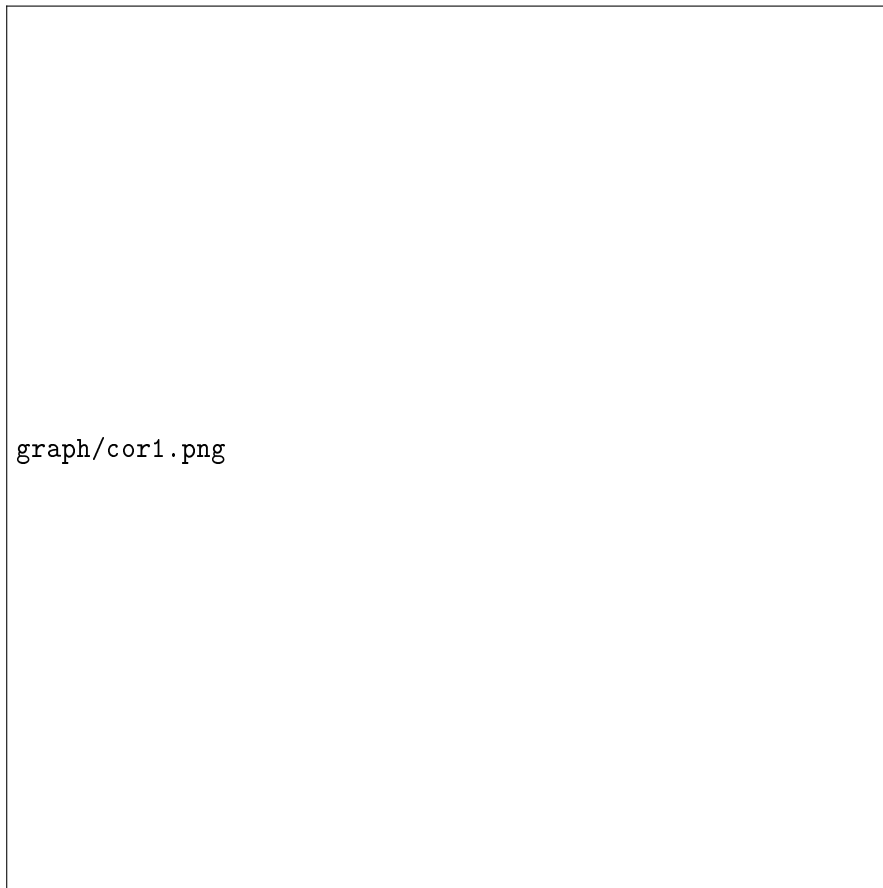


Figure 3.3: Correlation table for Microsoft and Apple against two index stocks

3.3.3 Regression

Show regression lines for MS and apple.

Discuss regression lines.

List y intercept, slope overall.

3.3.4 Analysis

Discuss any interesting overall observations here

Discuss any interesting overall observations here

3.4 January - June 2012

3.4.1 Plots

Discuss apple chart Discuss Microsoft chart

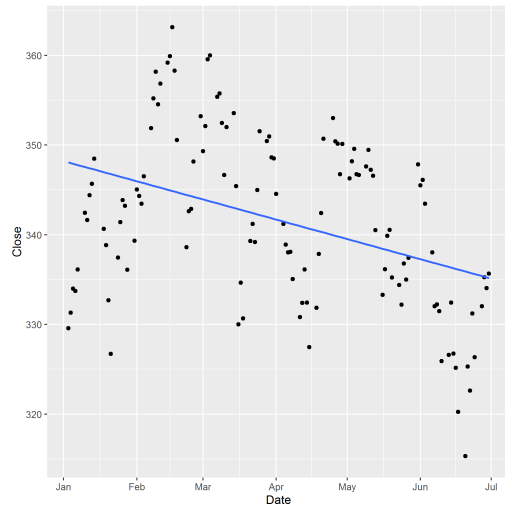


Figure 3.4: Linear regression line of Apple closing prices.

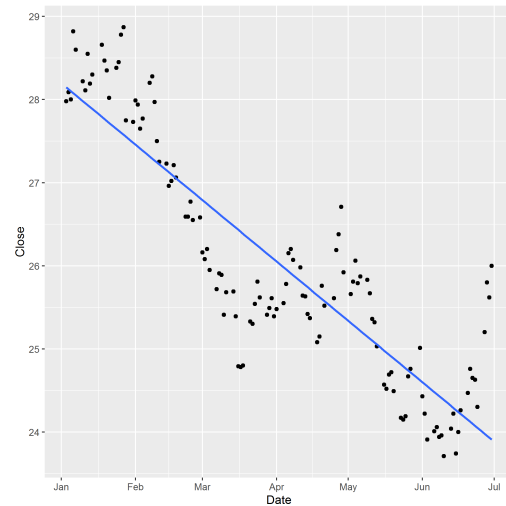


Figure 3.5: Linear regression line of Microsoft closing prices.

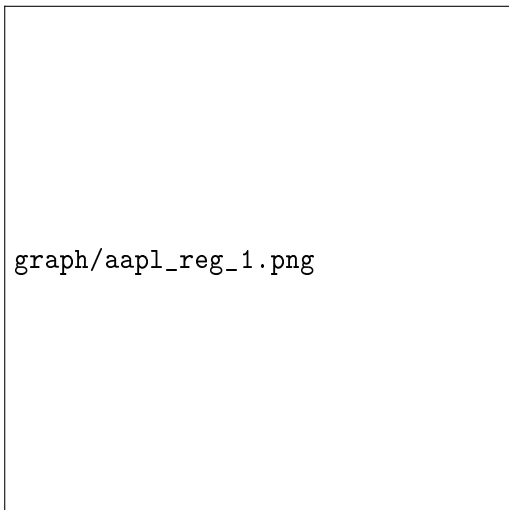


Figure 3.6: Linear regression line of Apple closing prices.

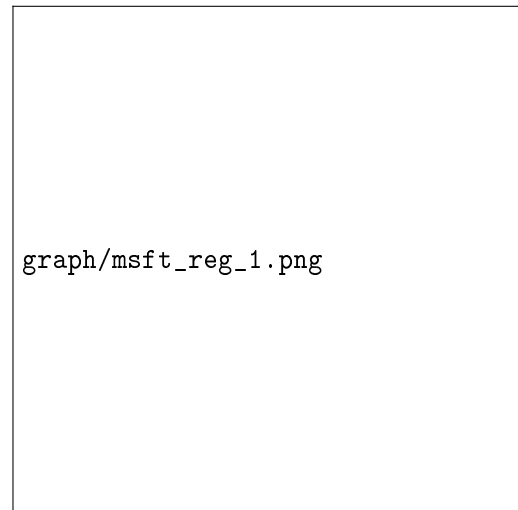


Figure 3.7: Linear regression line of Microsoft closing prices.

3.4.2 Correlation

Insert correlation table MS vs apple Discuss any interesting overall observations here

3.4.3 Regression

Show regression lines for MS and apple.
Discuss regression lines.

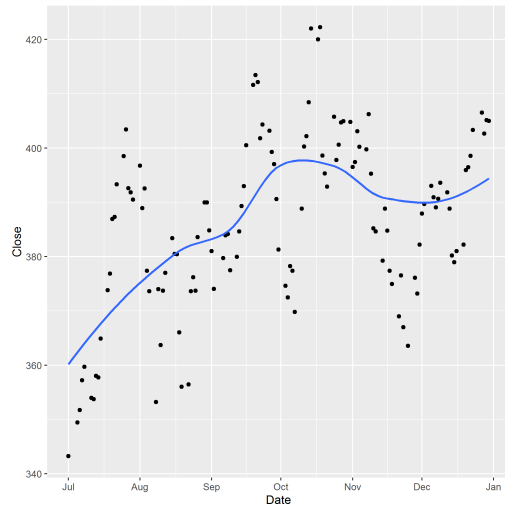


Figure 3.8: Scatter plot with graph of Apple stock

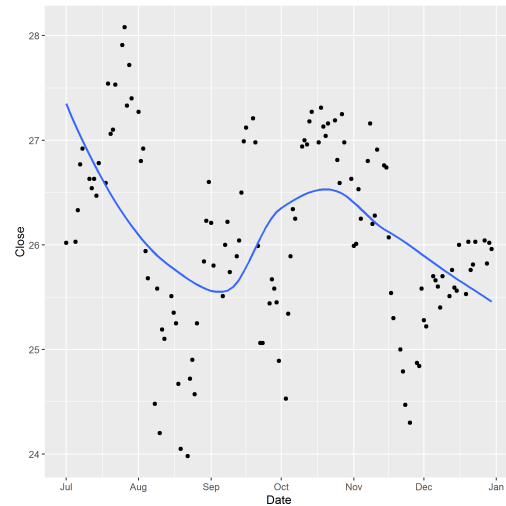


Figure 3.9: Scatter plot with graph of Microsoft stock

List y intercept, slope overall.

3.4.4 Analysis

Discuss any interesting overall observations here

3.5 July - December 2012

3.5.1 Plots

Discuss apple chart Discuss Microsoft chart

3.5.2 Correlation

Insert correlation table MS vs apple Discuss any interesting overall observations here

3.5.3 Regression

Show regression lines for MS and apple.

Discuss regression lines.

List y intercept, slope overall.

3.5.4 Analysis

Discuss any interesting overall observations here

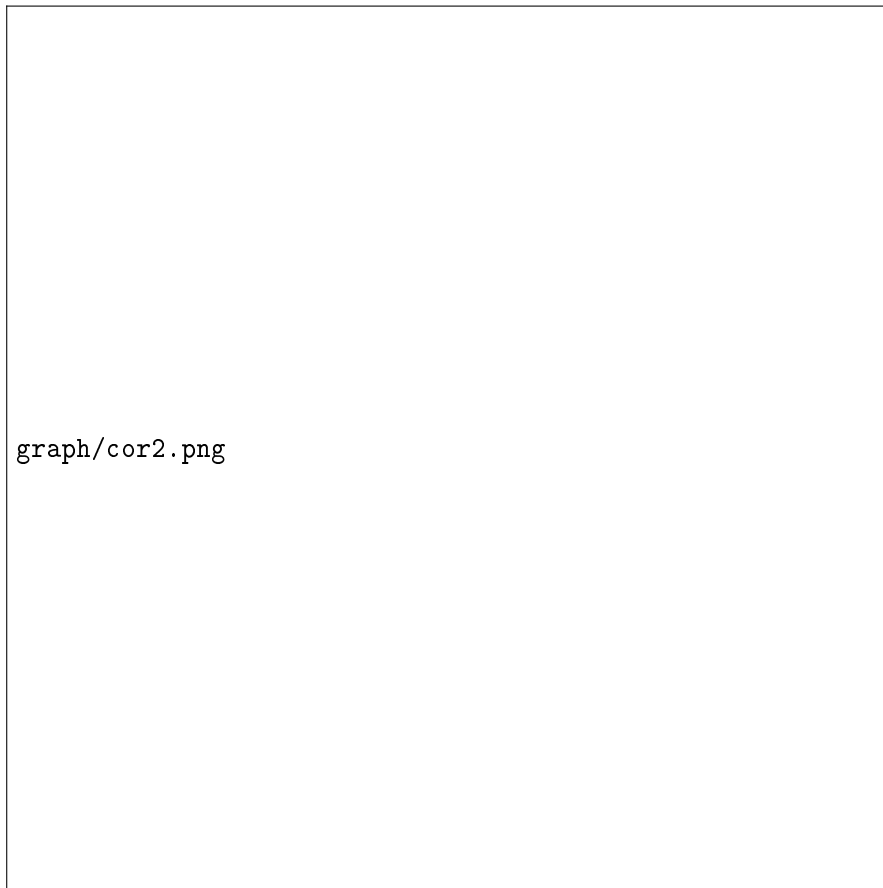


Figure 3.10: Correlation table for Microsoft and Apple against two index stocks

3.6 January - June 2013

3.6.1 Plots

1. Apple chart

3.6.2 Correlation

Insert correlation table MS vs apple Discuss any interesting overall observations here

3.6.3 Regression

Show regression lines for MS and apple.

Discuss regression lines.

List y intercept, slope overall.

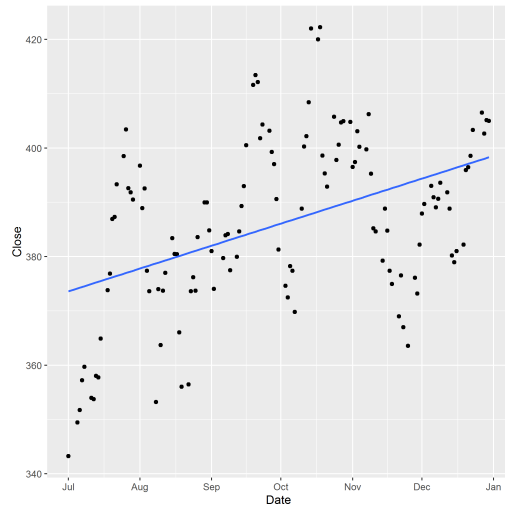


Figure 3.11: Linear regression line of Apple closing prices.

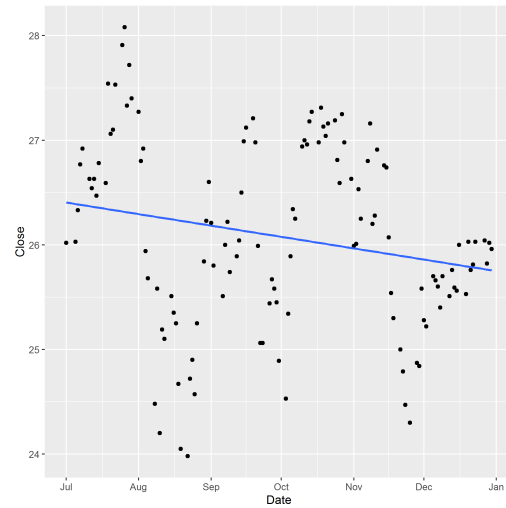


Figure 3.12: Linear regression line of Microsoft closing prices.

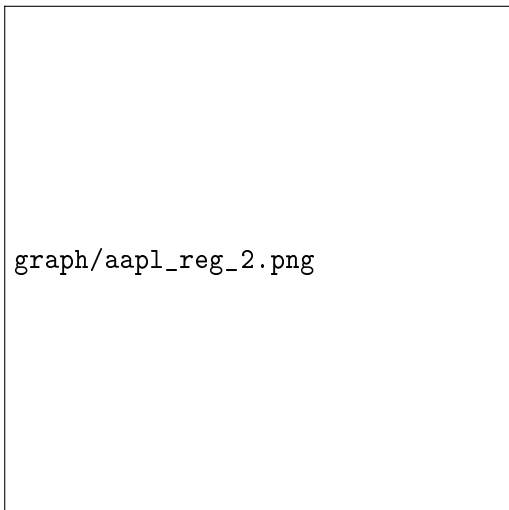


Figure 3.13: Linear regression line of Apple closing prices.

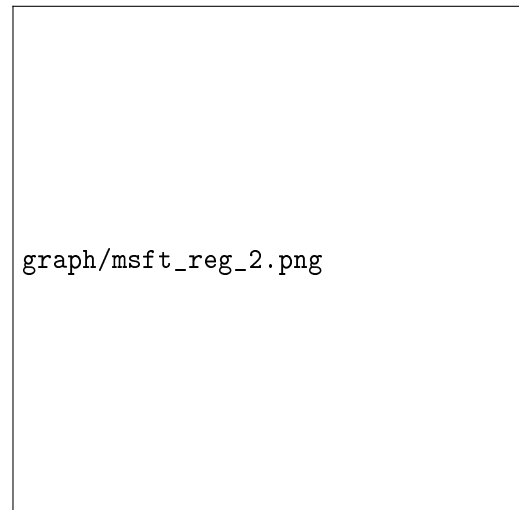


Figure 3.14: Linear regression line of Microsoft closing prices.

3.6.4 Analysis

Discuss any interesting observations here.

3.7 July - December 2013

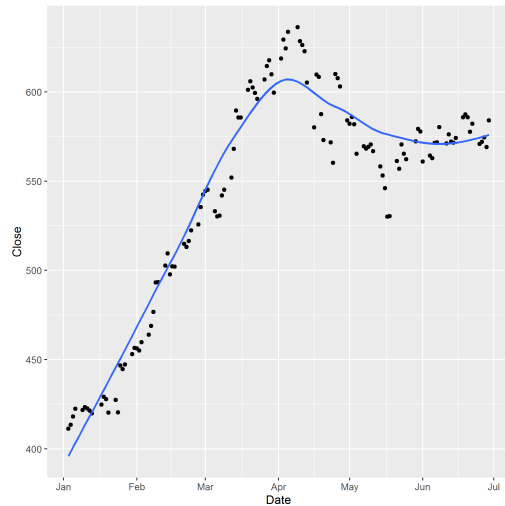


Figure 3.15: Scatter plot with graph of Apple stock

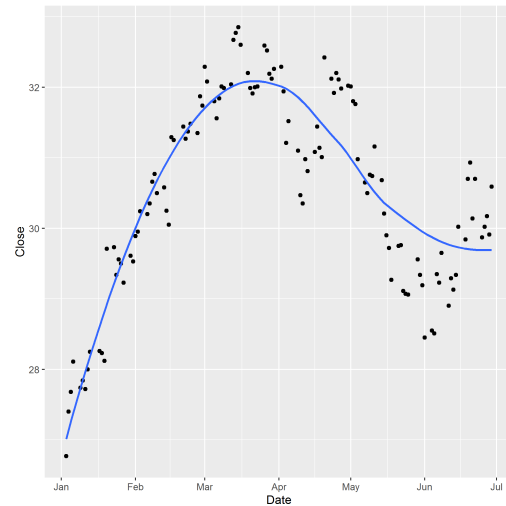


Figure 3.16: Scatter plot with graph of Microsoft stock

3.7.1 Plots

Discuss apple chart Discuss Microsoft chart

3.7.2 Correlation

Insert correlation table MS vs apple Discuss any interesting overall observations here

3.7.3 Regression

Show regression lines for MS and apple.

Discuss regression lines.

List y intercept, slope overall.

3.7.4 Analysis

Discuss any interesting overall observations here

3.8 January - June 2014

3.8.1 Plots

Discuss apple chart Discuss Microsoft chart

3.8.2 Correlation

Insert correlation table MS vs apple Discuss any interesting overall observations here

graph/cor3.png

Figure 3.17: Correlation table for Microsoft and Apple against two index stocks

3.8.3 Regression

Show regression lines for MS and apple.

Discuss regression lines.

List y intercept, slope overall.

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3.8.4 Analysis

Discuss any interesting overall observations here

Discuss any interesting overall observations here

3.9 July - December 2014

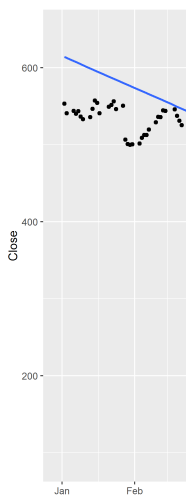


Figure 3.46: Li
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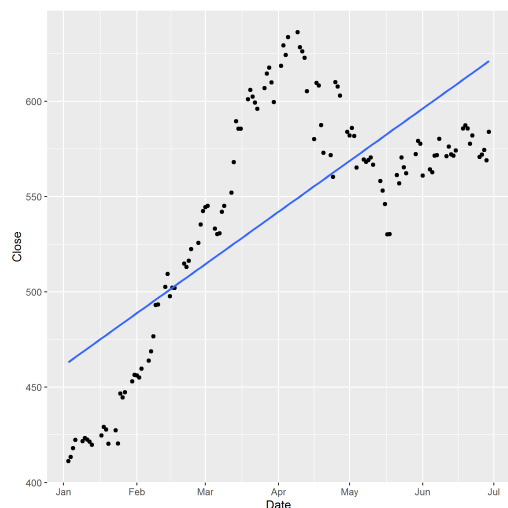


Figure 3.18: Linear regression line of Apple closing prices.

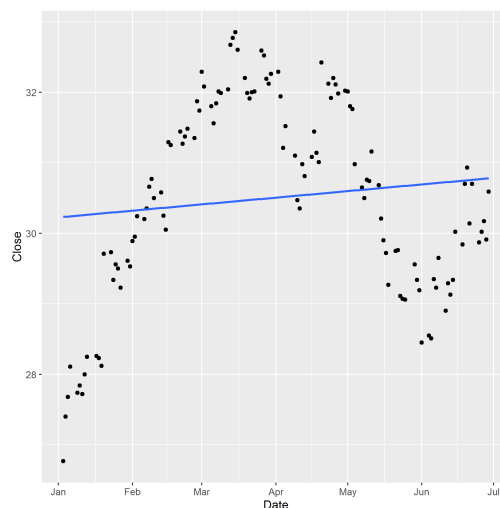


Figure 3.19: Linear regression line of Microsoft closing prices.

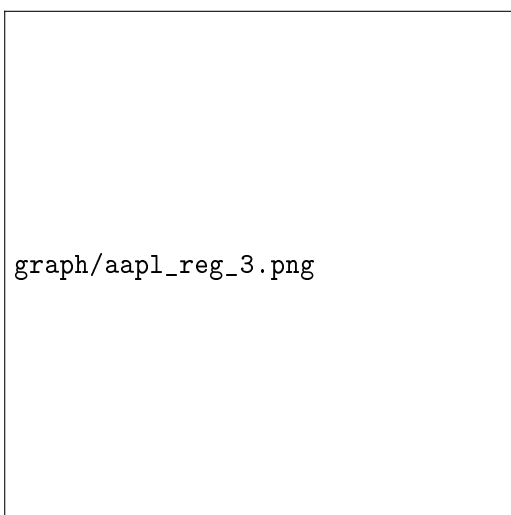


Figure 3.20: Linear regression line of Apple closing prices.

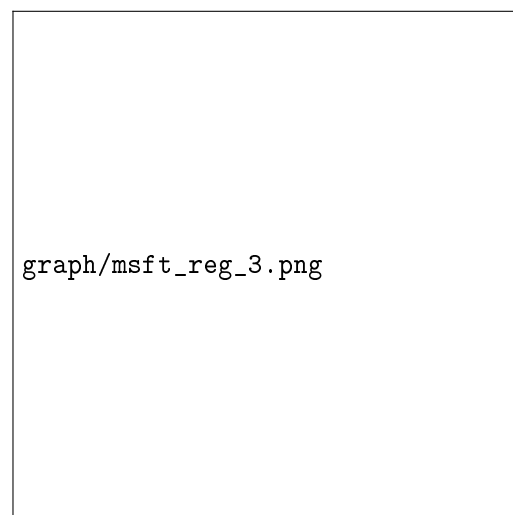


Figure 3.21: Linear regression line of Microsoft closing prices.

> 3.9.1 Plots >>

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Discuss apple chart Discuss Microsoft chart

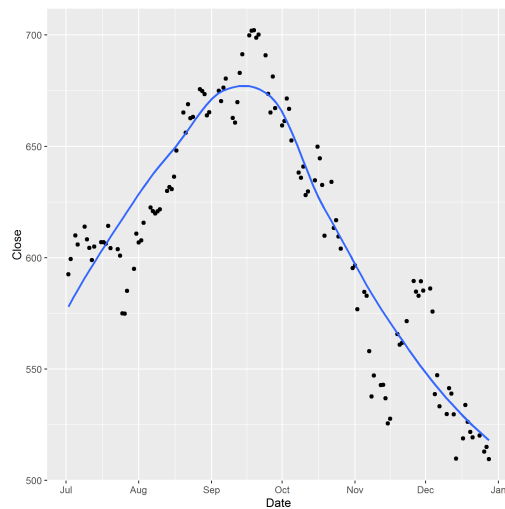


Figure 3.22: Scatter plot with graph of Apple stock

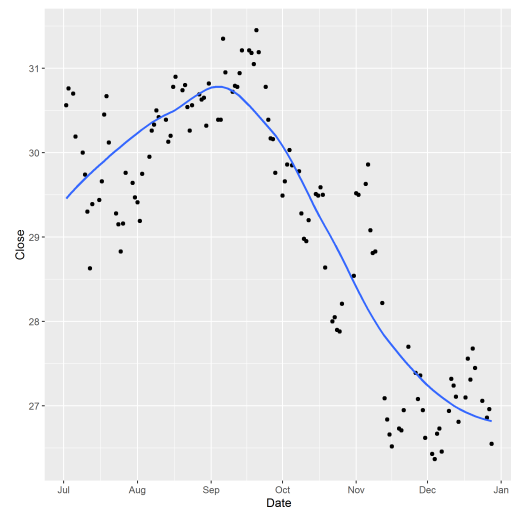


Figure 3.23: Scatter plot with graph of Microsoft stock

	MSFT	AAPL	IXIC	NDX
MSFT	1.0000000	0.8350667	0.5190070	0.6250235
AAPL	0.8350667	1.0000000	0.7089352	0.8036774
IXIC	0.5190070	0.7089352	1.0000000	0.9813014
NDX	0.6250235	0.8036774	0.9813014	1.0000000

Figure 3.24: Correlation table for Microsoft and Apple against two index stocks

>>> 3.9.2 Correlation

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Insert correlation table MS vs apple Discuss any interesting overall observations here

3.9.3 Regression

Show regression lines for MS and apple.

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Discuss regression lines.

List y intercept, slope overall.

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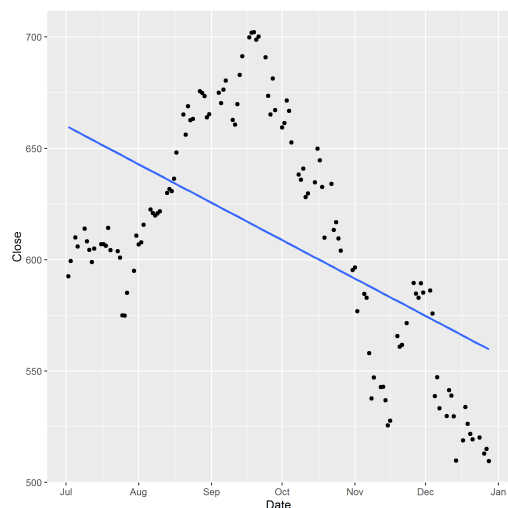


Figure 3.25: Linear regression line of Apple closing prices.

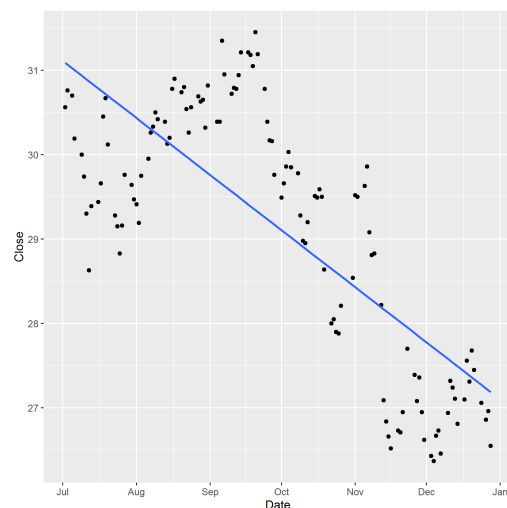


Figure 3.26: Linear regression line of Microsoft closing prices.

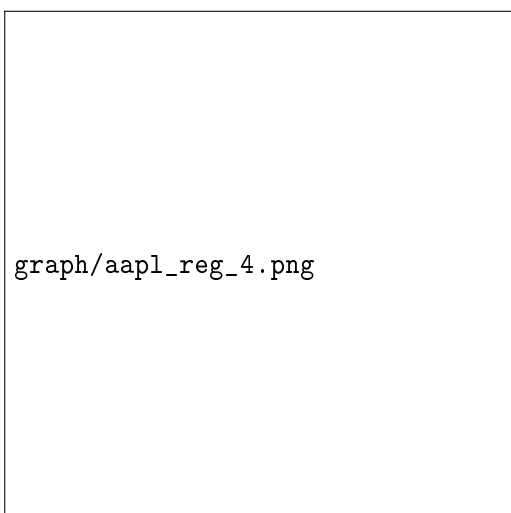


Figure 3.27: Linear regression line of Apple closing prices.

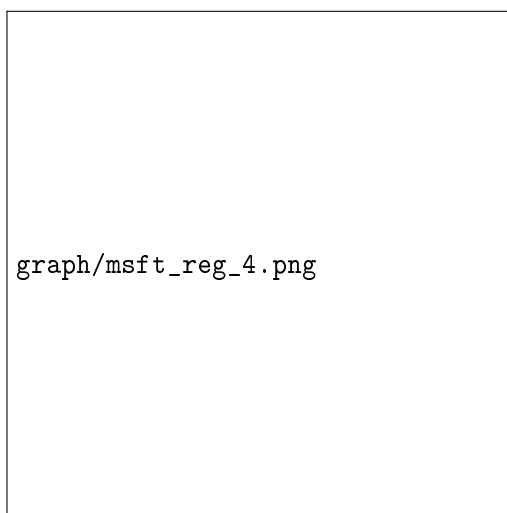


Figure 3.28: Linear regression line of Microsoft closing prices.

3.9.4 Analysis

Discuss any interesting overall observations here
 Discuss any interesting overall observations here

3.10 January - June 2015

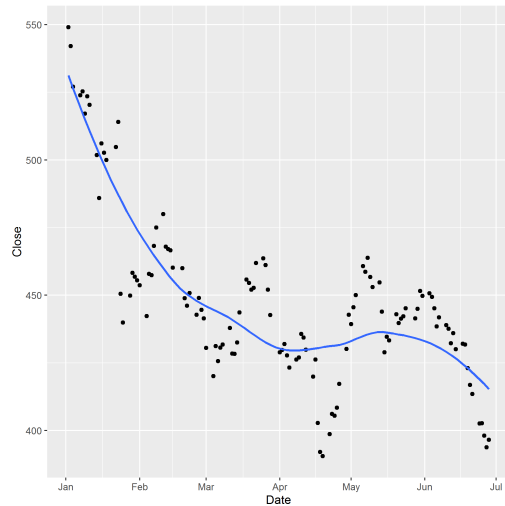


Figure 3.29: Scatter plot with graph of Apple stock

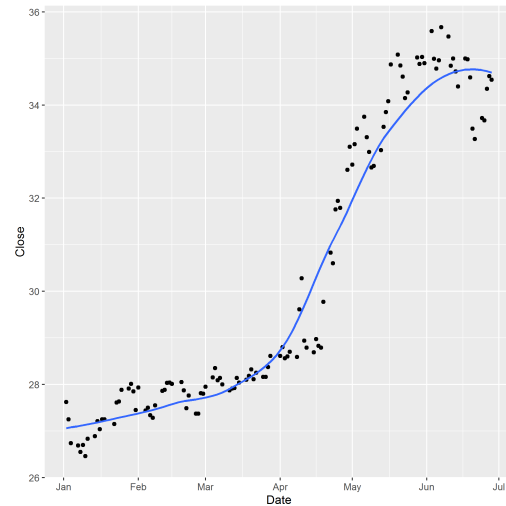


Figure 3.30: Scatter plot with graph of Microsoft stock

	MSFT	AAPL	IXIC	NDX
MSFT	1.0000000	-0.4422400	0.9486100	0.9423945
AAPL	-0.4422400	1.0000000	-0.4387663	-0.3454218
IXIC	0.9486100	-0.4387663	1.0000000	0.9897863
NDX	0.9423945	-0.3454218	0.9897863	1.0000000

Figure 3.31: Correlation table for Microsoft and Apple against two index stocks

3.10.1 Plots

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Discuss apple chart Discuss Microsoft chart

3.10.2 Correlation

ðñðïïîóóðñðïï

Insert correlation table MS vs apple Discuss any interesting overall observations here

3.10.3 Regression

Show regression lines for MS and apple.

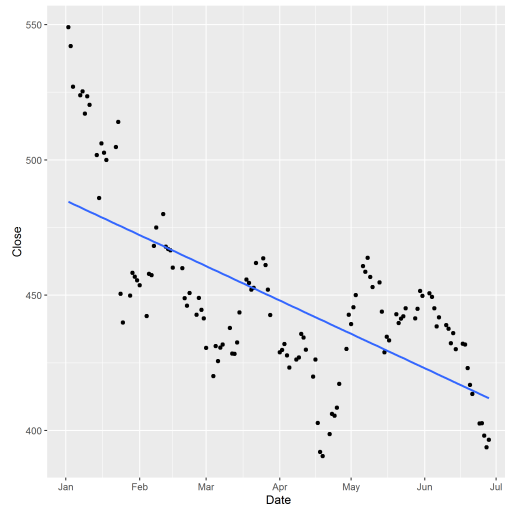


Figure 3.32: Linear regression line of Apple closing prices.

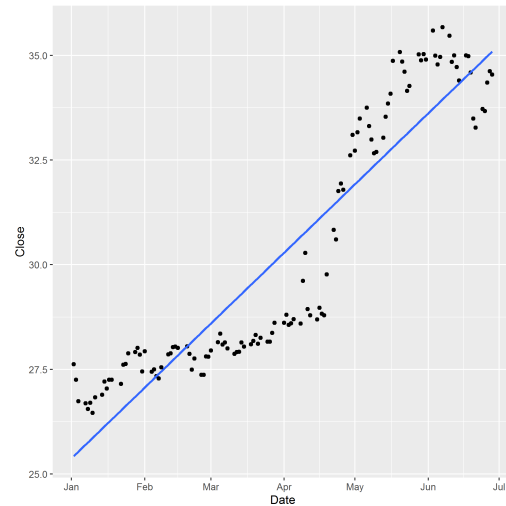


Figure 3.33: Linear regression line of Microsoft closing prices.

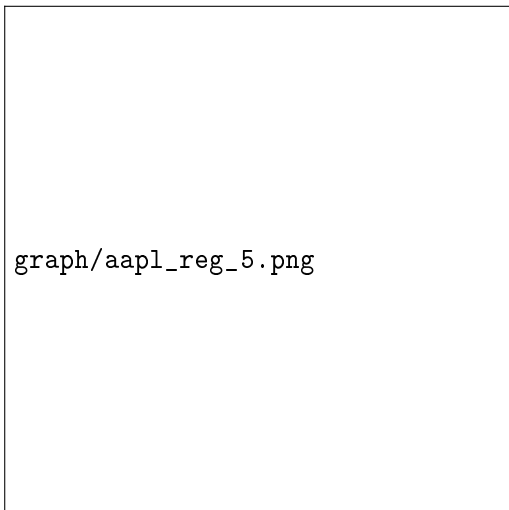


Figure 3.34: Linear regression line of Apple closing prices.

```
Call:
lm(formula = MSFT.df$MSFT.Close ~ date)

Residuals:
    Min       1Q   Median       3Q      Max
-2.4237 -1.1220  0.2174  1.0014  2.1917

Coefficients:
            Estimate Std. Error t value Pr(>|t|)
(Intercept) 25.373761   0.217740  116.53  <2e-16 ***
date         0.054579   0.002091   26.11  <2e-16 ***
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

Residual standard error: 1.206 on 122 degrees of freedom
Multiple R-squared:  0.8482,    Adjusted R-squared:  0.8469
F-statistic: 681.6 on 1 and 122 DF,  p-value: < 2.2e-16
```

Figure 3.35: Linear regression line of Microsoft closing prices.

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Discuss regression lines.
List y intercept, slope overall.
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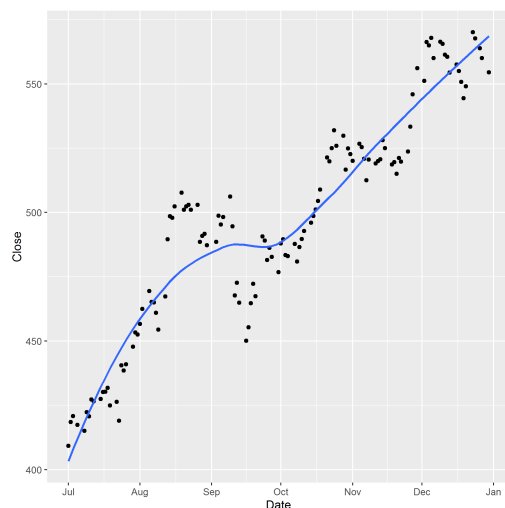


Figure 3.36: Scatter plot with graph of Apple stock

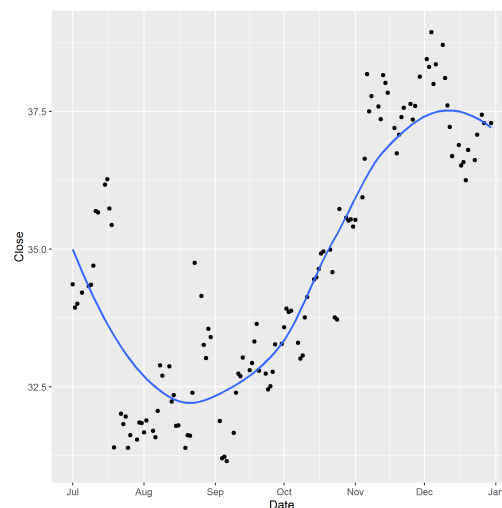


Figure 3.37: Scatter plot with graph of Microsoft stock

	MSFT	AAPL	IXIC	NDX
MSFT	1.0000000	0.6333784	0.7602917	0.7761854
AAPL	0.6333784	1.0000000	0.8935789	0.9031647
IXIC	0.7602917	0.8935789	1.0000000	0.9985740
NDX	0.7761854	0.9031647	0.9985740	1.0000000

Figure 3.38: Correlation table for Microsoft and Apple against two index stocks

3.10.4 Analysis

Discuss any interesting overall observations here

3.11 July - December 2015

3.11.1 Plots

Discuss apple chart Discuss Microsoft chart

Discuss apple chart Discuss Microsoft chart

3.11.2 Correlation

Discuss apple chart Discuss Microsoft chart

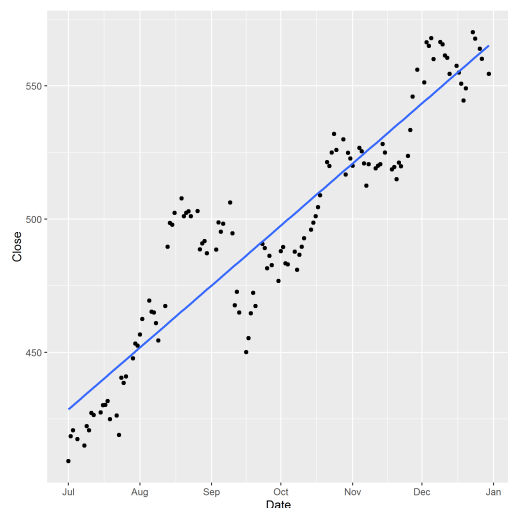


Figure 3.39: Linear regression line of Apple closing prices.

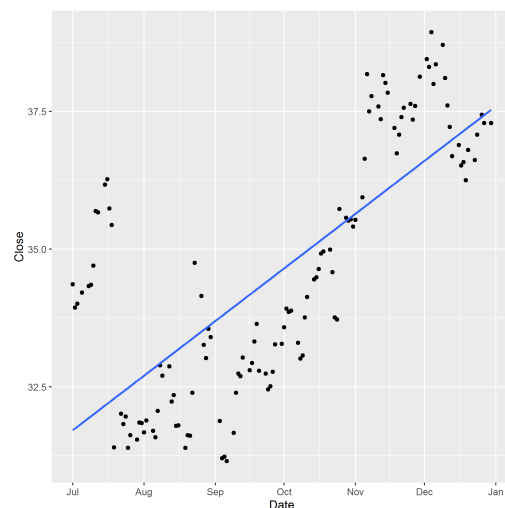


Figure 3.40: Linear regression line of Microsoft closing prices.

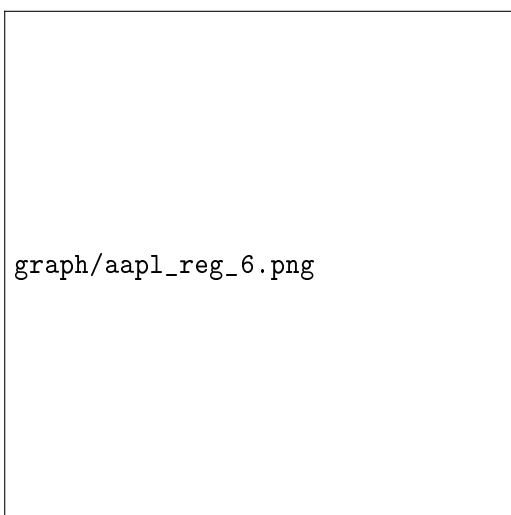


Figure 3.41: Linear regression line of Apple closing prices.

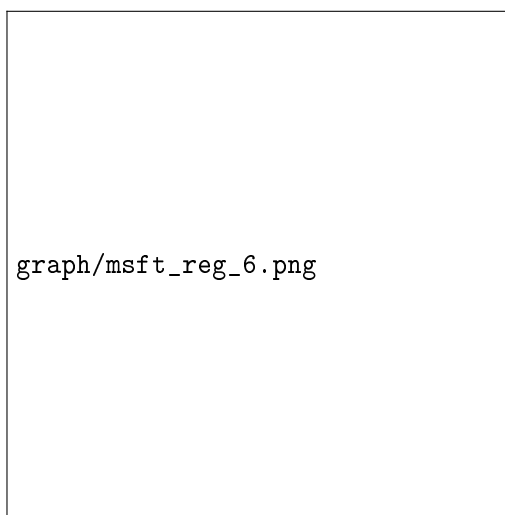


Figure 3.42: Linear regression line of Microsoft closing prices.

Insert correlation table MS vs apple Discuss any interesting overall observations here

3.11.3 Regression

Show regression lines for MS and apple.

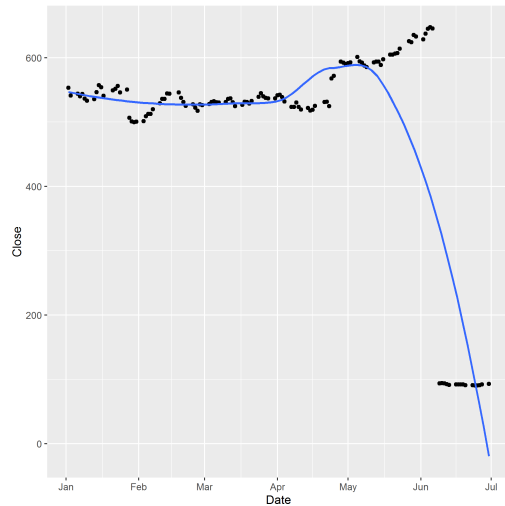


Figure 3.43: Scatter plot with graph of Apple stock

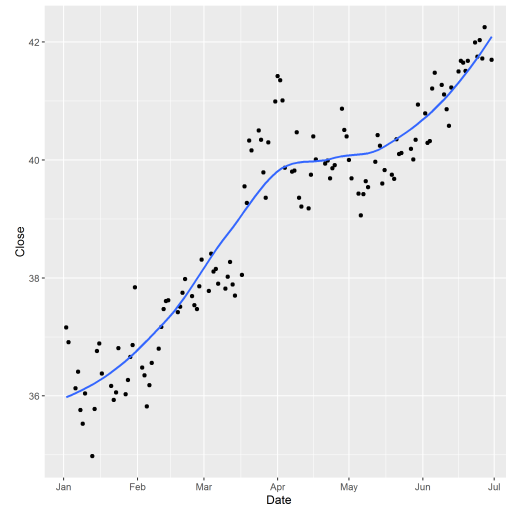


Figure 3.44: Scatter plot with graph of Microsoft stock

	MSFT	AAPL	IXIC	NDX
MSFT	1.0000000	-0.4096498	0.3273532	0.5376690
AAPL	-0.4096498	1.0000000	-0.5364466	-0.5781071
IXIC	0.3273532	-0.5364466	1.0000000	0.9294151
NDX	0.5376690	-0.5781071	0.9294151	1.0000000

Figure 3.45: Correlation table for Microsoft and Apple against two index stocks

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Discuss regression lines.

List y intercept, slope overall.

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3.11.4 Analysis

Discuss any interesting overall observations here

3.12 Forecasting and Analysis

Describe how well the models work for the performance over the next 6 months.

	MSFT	AAPL	IXIC	NDX
MSFT	1.0000000	0.8404415	0.8113685	0.3607278
AAPL	0.8404415	1.0000000	0.8621569	0.4642707
IXIC	0.8113685	0.8621569	1.0000000	0.5389417
NDX	0.3607278	0.4642707	0.5389417	1.0000000

Figure 3.52: Correlation table for Microsoft and Apple against two index stocks

4 Conclusions

Discuss anything particularly interesting.

Talk about how short term stock analysis is more likely to be useful due to stocks being similar to chaotic systems with little long term predictability.

Discuss how linear models are not likely to be best and future work should focus on better models.

What did we just do?

References