

Mark Brown Homework 1

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Question 1

Downloading the data

```
##1

getSymbols('aapl',from='2000-01-01', to = '2016-12-31')

## 'getSymbols' currently uses auto.assign=TRUE by default, but will
## use auto.assign=FALSE in 0.5-0. You will still be able to use
## 'loadSymbols' to automatically load data. getOption("getSymbols.env")
## and getOption("getSymbols.auto.assign") will still be checked for
## alternate defaults.
##
## This message is shown once per session and may be disabled by setting
## options("getSymbols.warning4.0"=FALSE). See ?getSymbols for details.
##
## WARNING: There have been significant changes to Yahoo Finance data.
## Please see the Warning section of '?getSymbols.yahoo' for details.
##
## This message is shown once per session and may be disabled by setting
## options("getSymbols.yahoo.warning"=FALSE).
## [1] "AAPL"

getSymbols('ibm',from='2000-01-01', to = '2016-12-31')

## [1] "IBM"

getSymbols('msft',from='2000-01-01', to = '2016-12-31')

## [1] "MSFT"

getSymbols('intc',from='2000-01-01', to = '2016-12-31')

## [1] "INTC"

getSymbols('amzn',from='2000-01-01', to = '2016-12-31')

## [1] "AMZN"
```

Calculating Daily Returns

```
#1a
d_aapl<-dailyReturn(AAPL)
d_ibm<-dailyReturn(IBM)
d_msft<-dailyReturn(MSFT)
d_intc<-dailyReturn(INTC)
d_amzn<-dailyReturn(AMZN)
```

Calculating Log Returns

```
#1b
l_aapl<-na.trim(diff(log(AAPL$AAPL.Adjusted)))
l_ibm<-na.trim(diff(log(IBM$IBM.Adjusted)))
l_msft<-na.trim(diff(log(MSFT$MSFT.Adjusted)))
l_intc<-na.trim(diff(log(INTC$INTC.Adjusted)))
l_amzn<-na.trim(diff(log(AMZN$AMZN.Adjusted)))
```

Calculating Annual Returns

```
#1c
a_aapl<-annualReturn(AAPL)
a_ibm<-annualReturn(IBM)
a_msft<-annualReturn(MSFT)
a_intc<-annualReturn(INTC)
a_amzn<-annualReturn(AMZN)
```

Question 2

Preparing the data for the summary table

```
Table<-function(x){
  output<- vector()
  for (i in seq_along(d_stocks)){
    output[1]<- mean(x)
    output[2]<- sd(x)
    output[3]<- kurtosis(x)
    output[4]<- skewness(x)
    return(output)
  }
}

d_stocks<-cbind.data.frame(d_aapl,d_ibm,d_msft,d_intc,d_amzn)
colnames(d_stocks)<-c("aapl","ibm","msft","intc","amzn")

l_stocks<-cbind.data.frame(l_aapl,l_ibm,l_msft,l_intc,l_amzn)
colnames(l_stocks)<-c("aapl","ibm","msft","intc","amzn")

Apple<-Table(d_stocks$aapl)
Ibm<-Table(d_stocks$ibm)
Microsoft<-Table(d_stocks$msft)
Intel<-Table(d_stocks$intc)
Amazon<-Table(d_stocks$amzn)

Apple1<-Table(l_stocks$aapl)
Ibm1<-Table(l_stocks$ibm)
Microsoft1<-Table(l_stocks$msft)
Intel1<-Table(l_stocks$intc)
Amazon1<-Table(l_stocks$amzn)

table<-cbind.data.frame(Apple,Ibm,Microsoft,Intel,Amazon)
table1<-cbind.data.frame(Apple1,Ibm1,Microsoft1,Intel1,Amazon1)
```

```
colnames(table1)<-c('Apple','Ibm','Microsoft','Intel','Amazon')
Summary_table<-rbind.data.frame(table,table1)

rownames(Summary_table)<-c('Mean','SD','Kurt','Skew','L-Mean','L-SD','L-Kurt','L-Skew')
```

Summary Table of the Stocks

Summary_table

```
##           Apple           Ibm      Microsoft           Intel
## Mean    1.179205e-03  0.0002290897  2.096500e-04  2.594849e-04
## SD      2.677857e-02  0.0166154977  1.982197e-02  2.410155e-02
## Kurt     3.625843e+01  7.5181809376  9.906230e+00  7.576246e+00
## Skew    -1.628470e+00  0.1016766826  2.126897e-01 -1.158198e-01
## L-Mean   8.090924e-04  0.0001512295  8.079284e-05  4.238762e-05
## L-SD     2.789368e-02  0.0166072727  1.981345e-02  2.417164e-02
## L-Kurt   1.134000e+02  7.8158333097  9.492805e+00  8.841808e+00
## L-Skew  -4.345111e+00 -0.1407493699 -1.342225e-01 -4.872793e-01
##
##           Amazon
## Mean    1.117172e-03
## SD      3.492593e-02
## Kurt     1.393808e+01
## Skew     1.159094e+00
## L-Mean   4.974413e-04
## L-SD     3.444317e-02
## L-Kurt   1.139094e+01
## L-Skew   4.536906e-01
```

Question 3

Here are the stats for an unweighted portfolio.

```
daily<-cbind(d_aapl, d_ibm, d_msft, d_intc, d_amzn)

portfolio<-rowMeans(daily)

basicStats(portfolio)
```

```
##           portfolio
## nobs          4277.000000
## NAs              0.000000
## Minimum        -0.132308
## Maximum         0.137920
## 1. Quartile    -0.007832
## 3. Quartile     0.008980
## Mean           0.000599
## Median          0.000748
## Sum            2.561582
## SE Mean         0.000275
## LCL Mean        0.000060
## UCL Mean        0.001138
## Variance        0.000323
## Stdev           0.017986
## Skewness        0.231861
```

```
## Kurtosis      5.310508
```

Question 4

Normal test for Apple

```
l_port<-log(portfolio+1)
```

```
normalTest(d_aapl,method = 'jb')
```

```
## Warning in if (class(x) == "fREG") x = residuals(x): the condition has
## length > 1 and only the first element will be used
```

```
##
```

```
## Title:
```

```
## Jarque - Bera Normalality Test
```

```
##
```

```
## Test Results:
```

```
## STATISTIC:
```

```
## X-squared: 236414.9248
```

```
## P VALUE:
```

```
## Asymptotic p Value: < 2.2e-16
```

```
##
```

```
## Description:
```

```
## Sun Sep 23 20:27:38 2018 by user: markb
```

Normal test for IBM

```
normalTest(d_ibm,method = 'jb')
```

```
## Warning in if (class(x) == "fREG") x = residuals(x): the condition has
## length > 1 and only the first element will be used
```

```
##
```

```
## Title:
```

```
## Jarque - Bera Normalality Test
```

```
##
```

```
## Test Results:
```

```
## STATISTIC:
```

```
## X-squared: 10093.4407
```

```
## P VALUE:
```

```
## Asymptotic p Value: < 2.2e-16
```

```
##
```

```
## Description:
```

```
## Sun Sep 23 20:27:38 2018 by user: markb
```

Normal test for Microsoft

```
normalTest(d_msft,method = 'jb')
```

```
## Warning in if (class(x) == "fREG") x = residuals(x): the condition has
## length > 1 and only the first element will be used
```

```
##
```

```
## Title:
```

```
## Jarque - Bera Normalality Test
```

```
##
```

```
## Test Results:
## STATISTIC:
## X-squared: 17541.7816
## P VALUE:
## Asymptotic p Value: < 2.2e-16
##
## Description:
## Sun Sep 23 20:27:38 2018 by user: markb
```

Normal test for Intel

```
normalTest(d_intc,method = 'jb')
```

```
## Warning in if (class(x) == "fREG") x = residuals(x): the condition has
## length > 1 and only the first element will be used
```

```
##
## Title:
## Jarque - Bera Normalality Test
##
## Test Results:
## STATISTIC:
## X-squared: 10252.0034
## P VALUE:
## Asymptotic p Value: < 2.2e-16
##
## Description:
## Sun Sep 23 20:27:38 2018 by user: markb
```

Normal Test for Amazon

```
normalTest(d_amzn,method = 'jb')
```

```
## Warning in if (class(x) == "fREG") x = residuals(x): the condition has
## length > 1 and only the first element will be used
```

```
##
## Title:
## Jarque - Bera Normalality Test
##
## Test Results:
## STATISTIC:
## X-squared: 35618.2739
## P VALUE:
## Asymptotic p Value: < 2.2e-16
##
## Description:
## Sun Sep 23 20:27:38 2018 by user: markb
```

Normal test for an unweighted portfolio

```
normalTest(portfolio,method = 'jb')
```

```
##
## Title:
## Jarque - Bera Normalality Test
##
## Test Results:
## STATISTIC:
```

```
##      X-squared: 5071.4506
##      P VALUE:
##      Asymptotic p Value: < 2.2e-16
##
## Description:
## Sun Sep 23 20:27:38 2018 by user: markb
```

Normal test for the log of Apple

```
normalTest(l_aapl,method = 'jb')
```

```
## Warning in if (class(x) == "fREG") x = residuals(x): the condition has
## length > 1 and only the first element will be used
```

```
##
## Title:
## Jarque - Bera Normalality Test
##
## Test Results:
## STATISTIC:
##      X-squared: 2306810.5492
##      P VALUE:
##      Asymptotic p Value: < 2.2e-16
##
## Description:
## Sun Sep 23 20:27:38 2018 by user: markb
```

Normal test for the log of IBM

```
normalTest(l_ibm,method = 'jb')
```

```
## Warning in if (class(x) == "fREG") x = residuals(x): the condition has
## length > 1 and only the first element will be used
```

```
##
## Title:
## Jarque - Bera Normalality Test
##
## Test Results:
## STATISTIC:
##      X-squared: 10911.9385
##      P VALUE:
##      Asymptotic p Value: < 2.2e-16
##
## Description:
## Sun Sep 23 20:27:38 2018 by user: markb
```

Normal test for the log of Microsoft

```
normalTest(l_msft,method = 'jb')
```

```
## Warning in if (class(x) == "fREG") x = residuals(x): the condition has
## length > 1 and only the first element will be used
```

```
##
## Title:
## Jarque - Bera Normalality Test
##
## Test Results:
```

```
## STATISTIC:
## X-squared: 16087.822
## P VALUE:
## Asymptotic p Value: < 2.2e-16
##
## Description:
## Sun Sep 23 20:27:38 2018 by user: markb
```

Normal test for the log of Intel

```
normalTest(l_intc,method = 'jb')
```

```
## Warning in if (class(x) == "fREG") x = residuals(x): the condition has
## length > 1 and only the first element will be used
```

```
##
## Title:
## Jarque - Bera Normalality Test
##
## Test Results:
## STATISTIC:
## X-squared: 14115.4327
## P VALUE:
## Asymptotic p Value: < 2.2e-16
##
## Description:
## Sun Sep 23 20:27:38 2018 by user: markb
```

Normal test for the log of Amazon

```
normalTest(l_amzn,method = 'jb')
```

```
## Warning in if (class(x) == "fREG") x = residuals(x): the condition has
## length > 1 and only the first element will be used
```

```
##
## Title:
## Jarque - Bera Normalality Test
##
## Test Results:
## STATISTIC:
## X-squared: 23291.8925
## P VALUE:
## Asymptotic p Value: < 2.2e-16
##
## Description:
## Sun Sep 23 20:27:38 2018 by user: markb
```

Normal test for the log of an unweighted portfolio.

```
normalTest(l_port,method = 'jb')
```

```
##
## Title:
## Jarque - Bera Normalality Test
##
## Test Results:
## STATISTIC:
## X-squared: 4842.9343
```

```
## P VALUE:
## Asymptotic p Value: < 2.2e-16
##
## Description:
## Sun Sep 23 20:27:38 2018 by user: markb
```