Minitest1_Harit.R

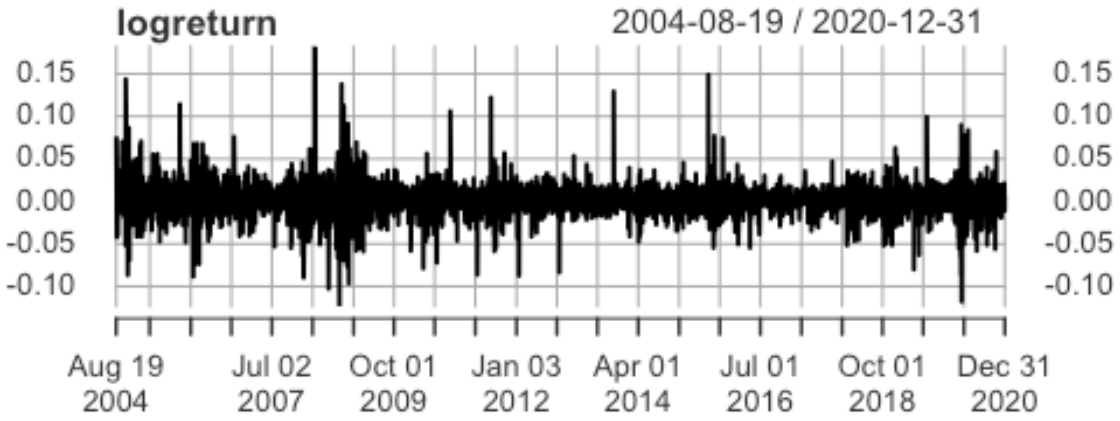
Harit hatawong 6104640112

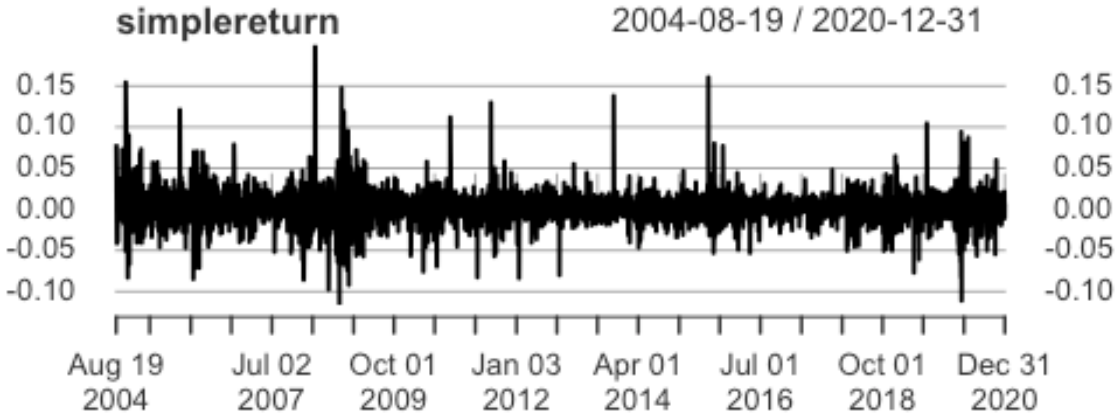
2021-02-11

```
setwd("/Users/jharit/Desktop")
cat(rep("\n",50))  #clear R Console

library(quantmod)

## Warning: package 'quantmod' was built under R version 3.6.2

## Loading required package: xts

## Warning: package 'xts' was built under R version 3.6.2

## Loading required package: zoo

## Warning: package 'zoo' was built under R version 3.6.2

##
## Attaching package: 'zoo'

## The following objects are masked from 'package:base':
##
##     as.Date, as.Date.numeric

## Loading required package: TTR

## Warning: package 'TTR' was built under R version 3.6.2

## Registered S3 method overwritten by 'quantmod':
##   method            from
##   as.zoo.data.frame zoo

library(fBasics)

## Loading required package: timeDate

## Loading required package: timeSeries

##
## Attaching package: 'timeSeries'

## The following object is masked from 'package:zoo':
##
##     time<-

##
## Attaching package: 'fBasics'
```

```
## The following object is masked from 'package:TTR':
##
##     volatility

library(sn)

## Warning: package 'sn' was built under R version 3.6.2

## Loading required package: stats4

##
## Attaching package: 'sn'

## The following object is masked from 'package:fBasics':
##
##     vech

## The following object is masked from 'package:stats':
##
##     sd

library(PerformanceAnalytics)

##
## Attaching package: 'PerformanceAnalytics'

## The following objects are masked from 'package:timeDate':
##
##     kurtosis, skewness

## The following object is masked from 'package:graphics':
##
##     legend

library(car)

## Warning: package 'car' was built under R version 3.6.2

## Loading required package: carData

## Warning: package 'carData' was built under R version 3.6.2

##
## Attaching package: 'car'

## The following object is masked from 'package:fBasics':
##
##     densityPlot

library(tseries)

## Warning: package 'tseries' was built under R version 3.6.2

library(forecast)
```

```
## Warning: package 'forecast' was built under R version 3.6.2

getSymbols("GOOG",from="2004-08-19",to="2021-01-01")

## '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.

## [1] "GOOG"

#get adjusted price
Price=GOOG[,6]
logPrice=log(Price)

#answer for question a.
#calculate for returns
logreturn=diff(log(Price))
simplereturn=exp(logreturn)-1

#ploting
par(mfrow=c(2,1))
plot(logreturn,type='l')
plot(simplereturn)
```

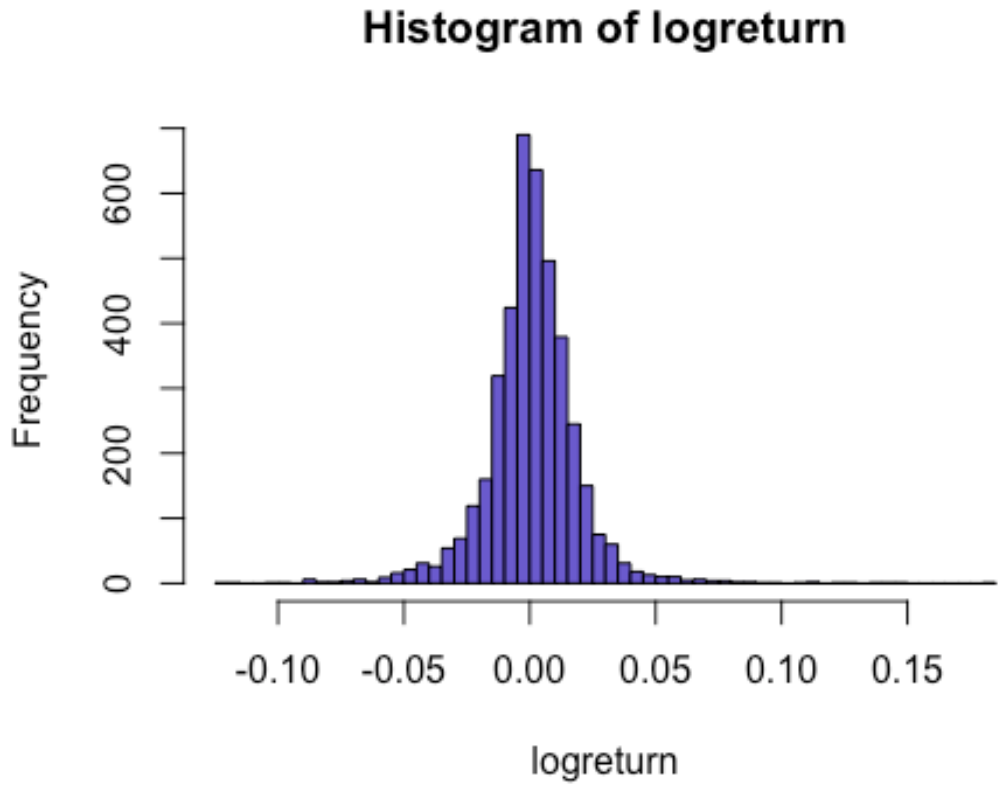




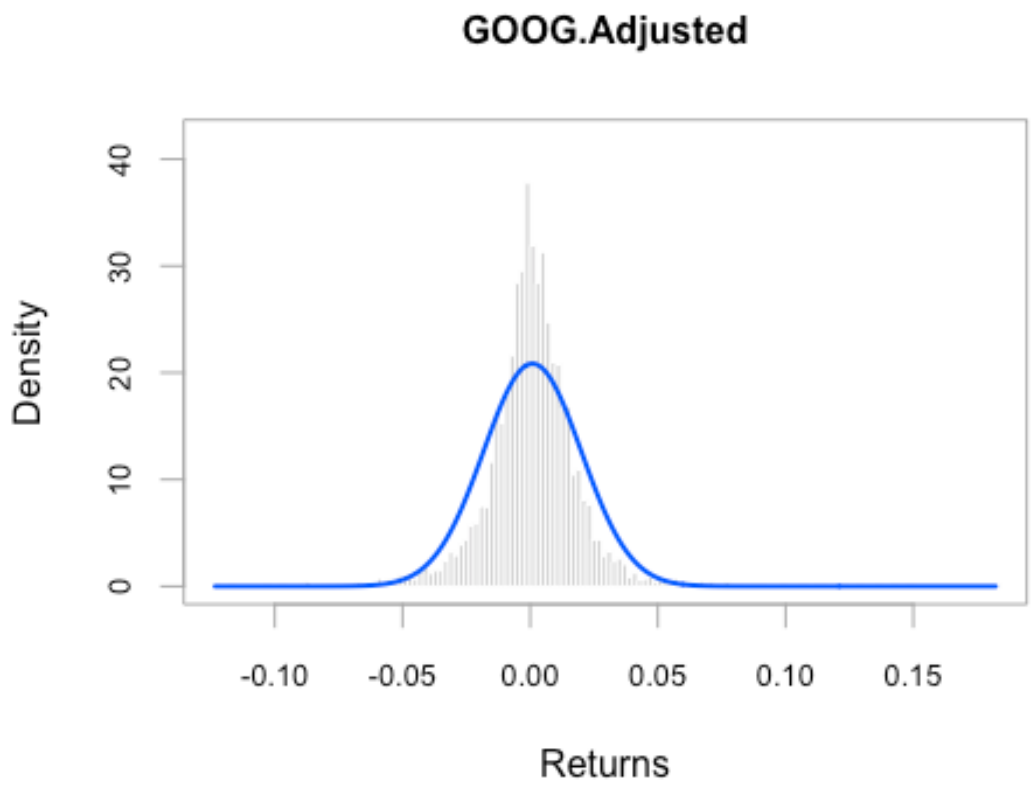

```
#answer for question b.
#calculate for logrereturn statistics
table.Stats(logreturn)
```

```
##                   GOOG.Adjusted
## Observations         4121.0000
## NAs                     1.0000
## Minimum                -0.1234
## Quartile 1             -0.0074
## Median                  0.0007
## Arithmetic Mean         0.0009
## Geometric Mean          0.0007
## Quartile 3              0.0100
## Maximum                 0.1823
## SE Mean                 0.0003
## LCL Mean (0.95)         0.0003
## UCL Mean (0.95)         0.0014
## Variance                0.0004
## Stdev                   0.0191
## Skewness                0.4528
## Kurtosis                9.1391
```

```r
#answer for question c.
#ploting the density function
par(mfrow=c(1,1))
hist(logreturn, breaks=100, col="slateblue")
```




```r
chart.Histogram(logreturn,methods = c("add.normal"))
```




```
#test for normality
newlogreturn <- logreturn[2:nrow(logreturn),]
jarque.bera.test(newlogreturn)

##
##  Jarque Bera Test
##
## data:  newlogreturn
## X-squared = 14482, df = 2, p-value < 2.2e-16
```

H0: normal

p-value is less than alpha = 0.05

So, we reject the H0

```
#answer for question d.
# Ho: E(logreturn)-0.08 = 0
logreturnfortest = newlogreturn-0.08
t.test(logreturnfortest)
```

```
## Warning in tstat + c(-cint, cint): Recycling array of length 1 in array-
vector arithmetic is deprecated.
##   Use c() or as.vector() instead.

## Warning in cint * stderr: Recycling array of length 1 in vector-array
arithmetic is deprecated.
##   Use c() or as.vector() instead.

##
##  One Sample t-test
##
## data:  logreturnfortest
## t = -265.51, df = 4120, p-value < 2.2e-16
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##  -0.07972127 -0.07855256
## sample estimates:
##   mean of x
## -0.07913692
```

p-value is less than alpha = 0.05

So, we reject the H0

```
#answer for question e.
#construct the CI 95% using the information from t-test
t.test(newlogreturn)

## Warning in tstat + c(-cint, cint): Recycling array of length 1 in array-
vector arithmetic is deprecated.
##   Use c() or as.vector() instead.

## Warning in tstat + c(-cint, cint): Recycling array of length 1 in vector-
array arithmetic is deprecated.
##   Use c() or as.vector() instead.

##
##  One Sample t-test
##
## data:  newlogreturn
## t = 2.8957, df = 4120, p-value = 0.003803
## alternative hypothesis: true mean is not equal to 0
## 95 percent confidence interval:
##  0.0002787253 0.0014474425
## sample estimates:
##    mean of x
## 0.0008630839
```

```r
#answer for question f.
#Test Ho:Skewness = 0 GOOG logreturn
T=length(newlogreturn)
S=skewness(newlogreturn)
tst = S/sqrt(6/T)
tst
```

```
## [1] 11.8664
```

```r
pv = 2*(1-pnorm(tst))
pv
```

```
## [1] 0
```

p-value is less than alpha = 0.05

So, we reject the H0

```r
#answer for question g.
# Test H0: excess kurtosis =0
K = kurtosis(newlogreturn)
tstk = K/sqrt(24/T)
tstk
```

```
## [1] 119.7564
```

```r
pvk = 2*(1-pnorm(tstk))
pvk
```

```
## [1] 0
```

p-value is less than alpha = 0.05

So, we reject the H0