HW 2 QF 104

Zheng Li

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```
library(quantmod)
library(moments)

getSymbols("INTC")
```

```
## [1] "INTC"
```

```
getSymbols("GM")
```

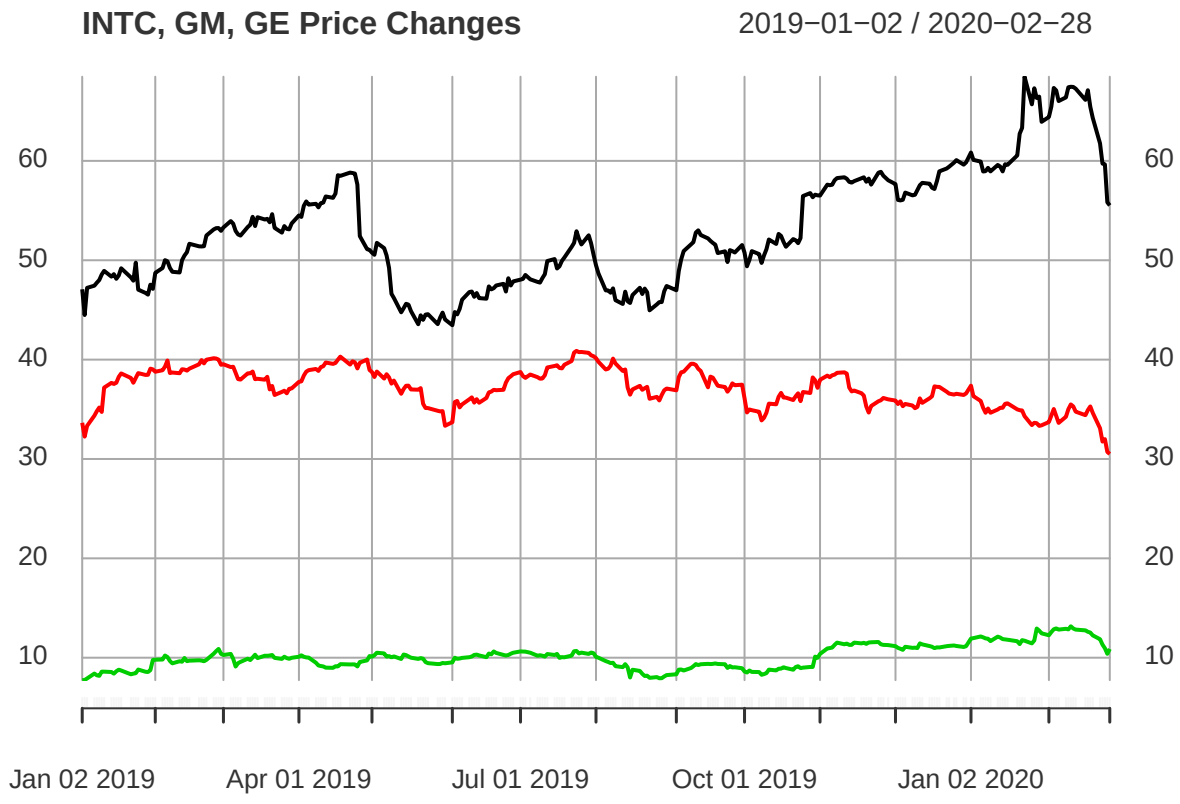
```
## [1] "GM"
```

```
getSymbols("GE")
```

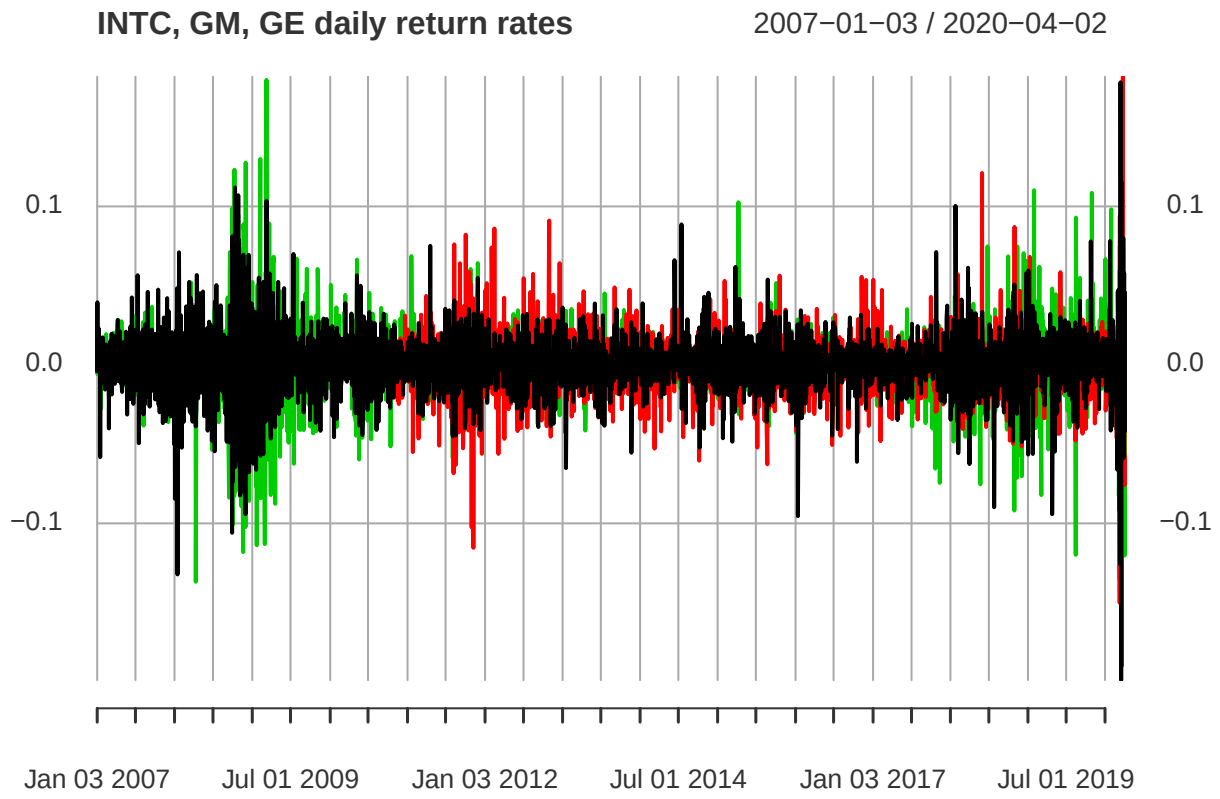
```
## [1] "GE"
```

```
INTCc <- INTC$INTC.Close["20190101/20200301"]
GMc <- GM$GM.Close["20190101/20200301"]
GEc <- GE$GE.Close["20190101/20200301"]

INTCo <- INTC$INTC.Open["20190101/20200301"]
GMo <- GM$GM.Open["20190101/20200301"]
GEo <- GE$GE.Open["20190101/20200301"]

INTCr <- dailyReturn(INTC, type = "log")
GMr <- dailyReturn(GM, type = "log")
GEr <- dailyReturn(GE, type = "log")
```

```
plot(cbind(INTCc,GMc,GEc), ylab = "Close Price", main = "INTC, GM, GE Price Changes")
```




```
plot(cbind(INTCr,GMr,GEr), ylab = "Close Price", main = "INTC, GM, GE daily return rates")
```




```
cat("Mean of INTC:", mean(INTCc))
```

```
## Mean of INTC: 52.97058
```

```
cat("Standard Deviation of INTC:", sd(INTCc))
```

```
## Standard Deviation of INTC: 5.874091
```

```
cat("Skewness of INTC:", skewness(INTCc))
```

```
## Skewness of INTC: 0.6305262
```

```
cat("Kurtosis of INTC:", kurtosis(INTCc), "\n")
```

```
## Kurtosis of INTC: 2.780747
```

```
cat("Mean of GM:", mean(GMc))
```

```
## Mean of GM: 37.12682
```

```r
cat("Standard Deviation of GM:", sd(GMc))
```

```
## Standard Deviation of GM: 1.978565
```

```r
cat("Skewness of GM:", skewness(GMc))
```

```
## Skewness of GM: -0.4366476
```

```r
cat("Kurtosis of GM:", kurtosis(GMc), "\n")
```

```
## Kurtosis of GM: 2.845799
```

```r
cat("Mean of GE:", mean(GEc))
```

```
## Mean of GE: 10.10285
```

```r
cat("Standard Deviation of GE:", sd(GEc))
```

```
## Standard Deviation of GE: 1.203313
```

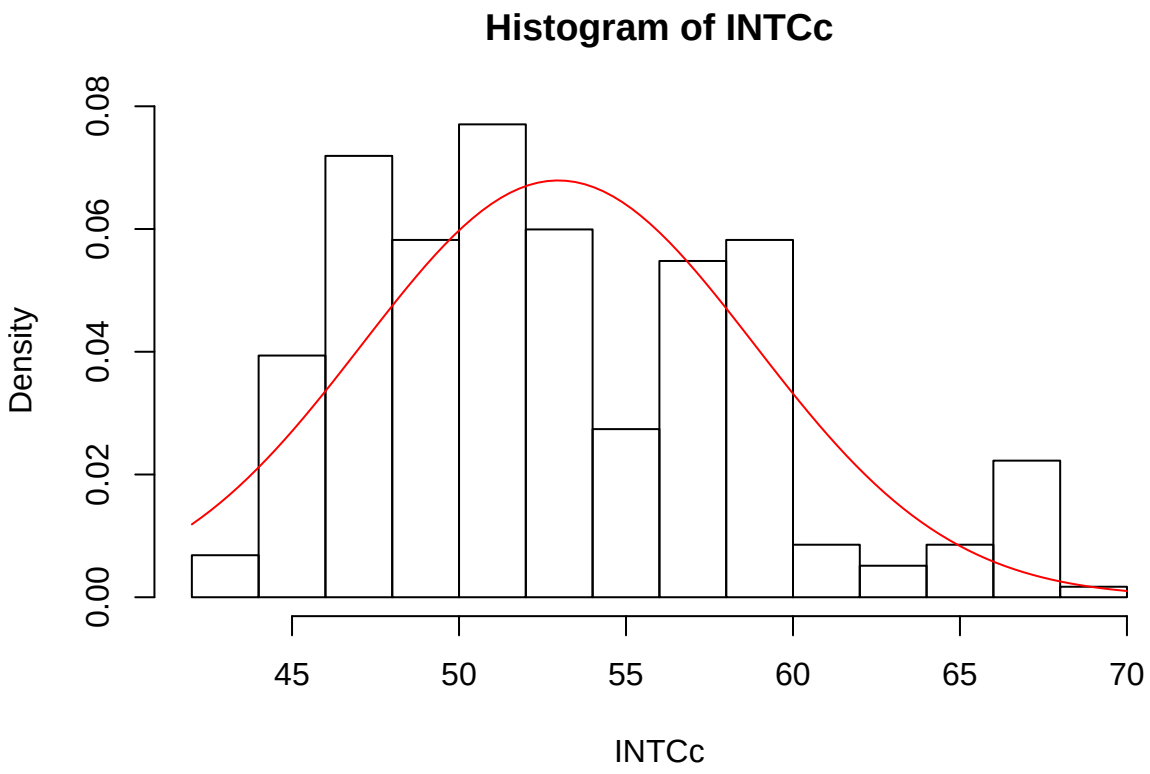
```r
cat("Skewness of GE:", skewness(GEc))
```

```
## Skewness of GE: 0.3818838
```

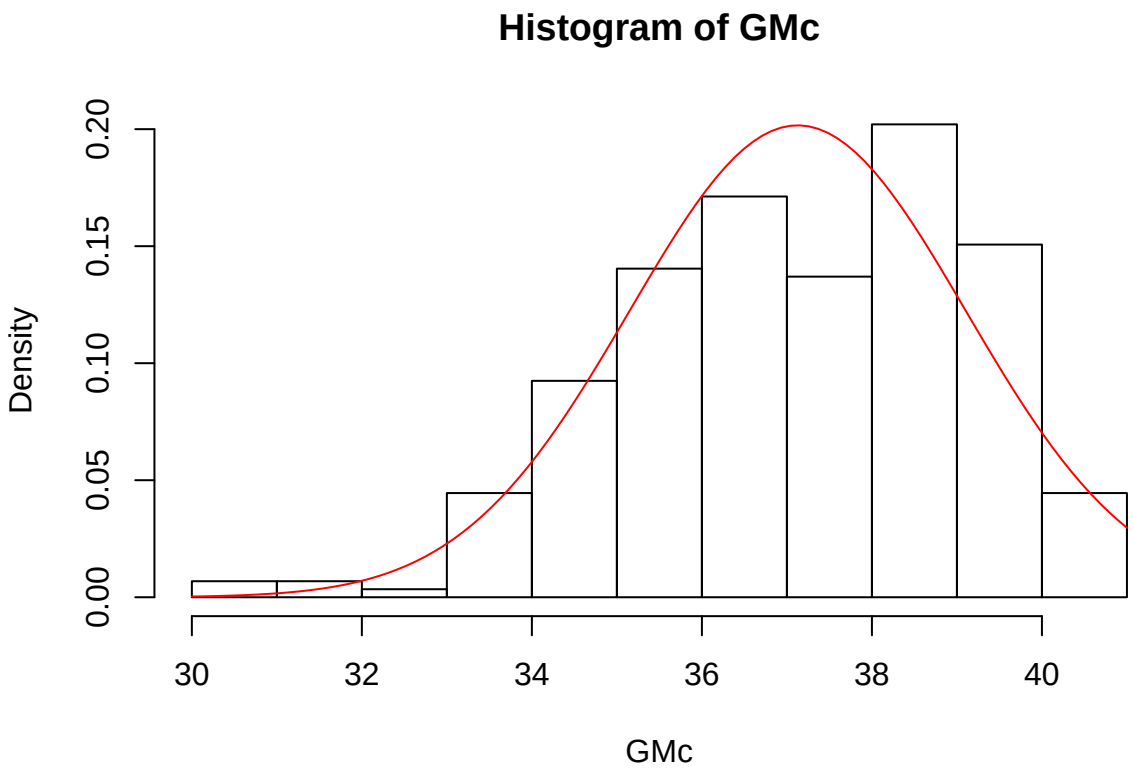
```r
cat("Kurtosis of GE:", kurtosis(GEc), "\n")
```

```
## Kurtosis of GE: 2.650829
```

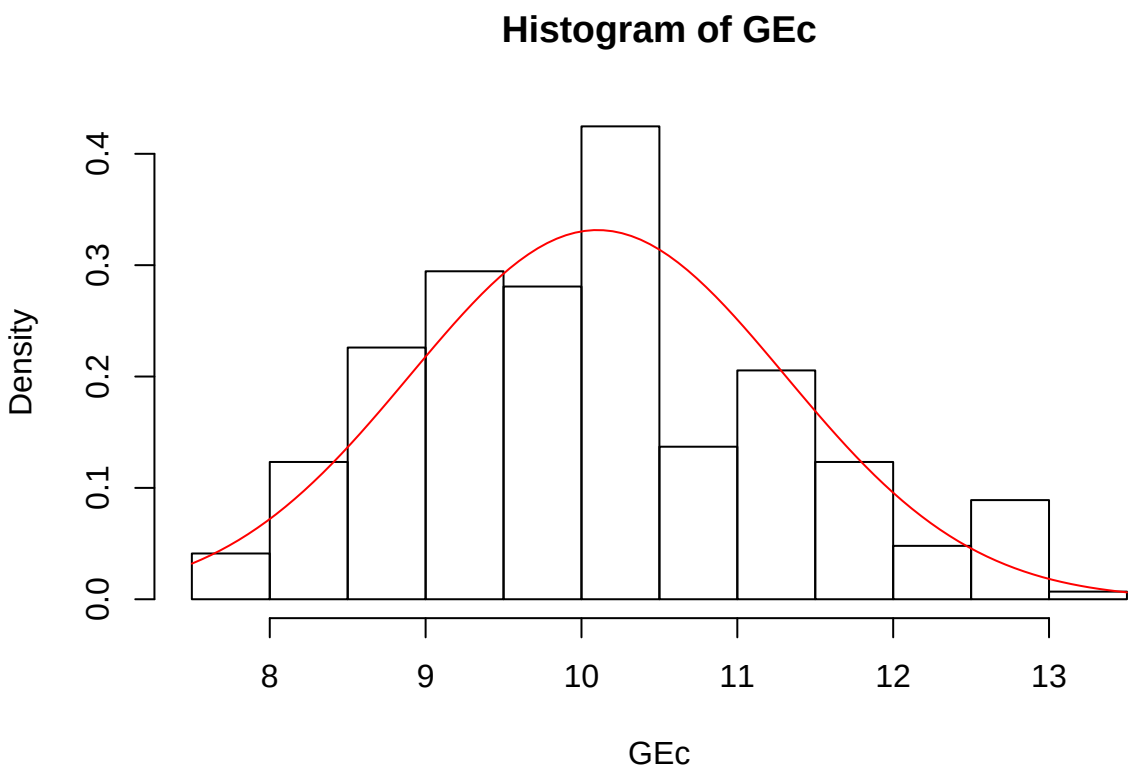
```r
hist(INTCc, freq = FALSE)
curve(dnorm(x,mean(INTCc),sd(INTCc)), add=TRUE,col = "red")
```




```
hist(GMc, freq = FALSE)
curve(dnorm(x,mean(GMc),sd(GMc)), add=TRUE,col = "red")
```




```
hist(GEc, freq = FALSE)
curve(dnorm(x,mean(GEc),sd(GEc)), add=TRUE,col = "red")
```




```
print("GE price histogram is closer to a normal distribution")
```

```
## [1] "GE price histogram is closer to a normal distribution"
```

```
INTCS <- as.integer(3000/coredata(INTCo[1]))
GMS <- as.integer(2000/coredata(GMo[1]))
GES <- as.integer(5000/coredata(GEo[1]))
value <- (INTCc * INTCS) + (GMc * GMS) + (GEc * GES)

png(file = "PortfolioValue.png")
plot(value)
dev.off()
```

```
## pdf
##   2
```

```
cat("The final return rate is", 1 + (value[length(value)] - 10000) / 10000)
```

```
## The final return rate is 1.302216
```

Figure 1: PortfolioValue.png