Derivatives Homework 1

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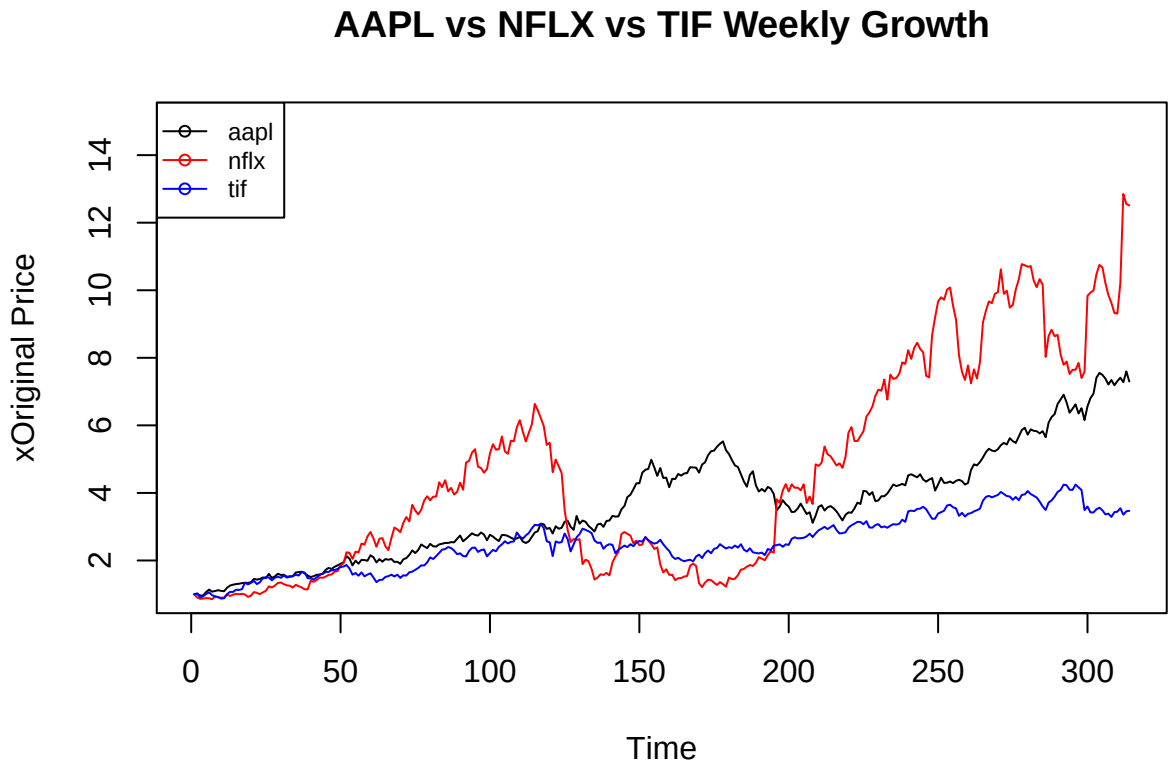
July 27, 2015

Problem 5

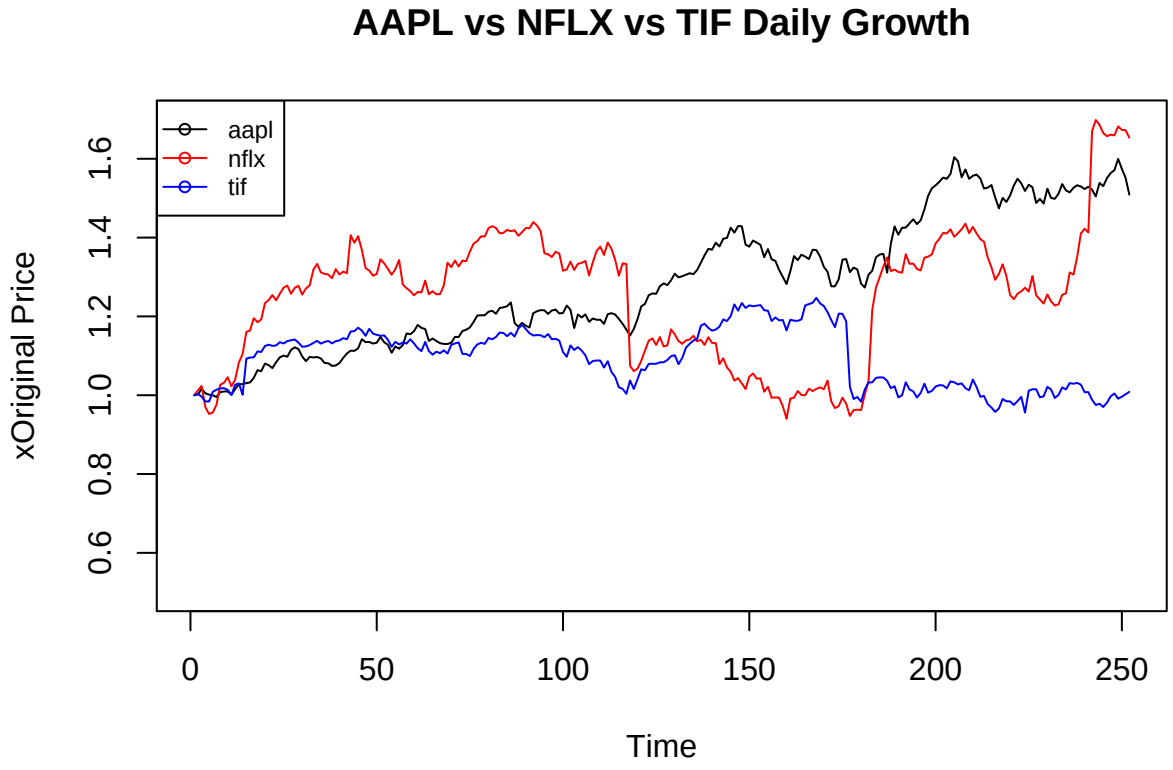
```
orderByDate <- function (x){
  x$DateTime <- as.Date(x$Date, "%Y-%m-%d")
  x <- x[order(x$DateTime, decreasing=F),]
  x <- x[complete.cases(x),]
  x
}


aapl <- orderByDate(read.csv("aapl.csv"))
aaplDaily <- orderByDate(read.csv("aaplDaily.csv"))

nflx <- orderByDate(read.csv("nflx.csv"))
nflxDaily <- orderByDate(read.csv("nflxDaily.csv"))

tif <- orderByDate(read.csv("tif.csv"))
tifDaily <- orderByDate(read.csv("tifDaily.csv"))
```

a

```
normalReturn <- function(x){
  x$normalReturn <- x$Adj.Close / x$Adj.Close[1]
  x
}

aapl <- normalReturn(aapl)
nflx <- normalReturn(nflx)
tif <- normalReturn(tif)

plot.ts(aapl$normalReturn, type = "l", ylim = c(1,15), ylab = "xOriginal Price",main = "AAPL vs NFLX vs
lines(nflx$normalReturn, col = "red")
lines(tif$normalReturn, col = "blue")
legend("topleft", c("aapl","nflx", "tif"), pch=1, col=c('black', 'red', "blue"),
       lty=1, cex=.75)
```

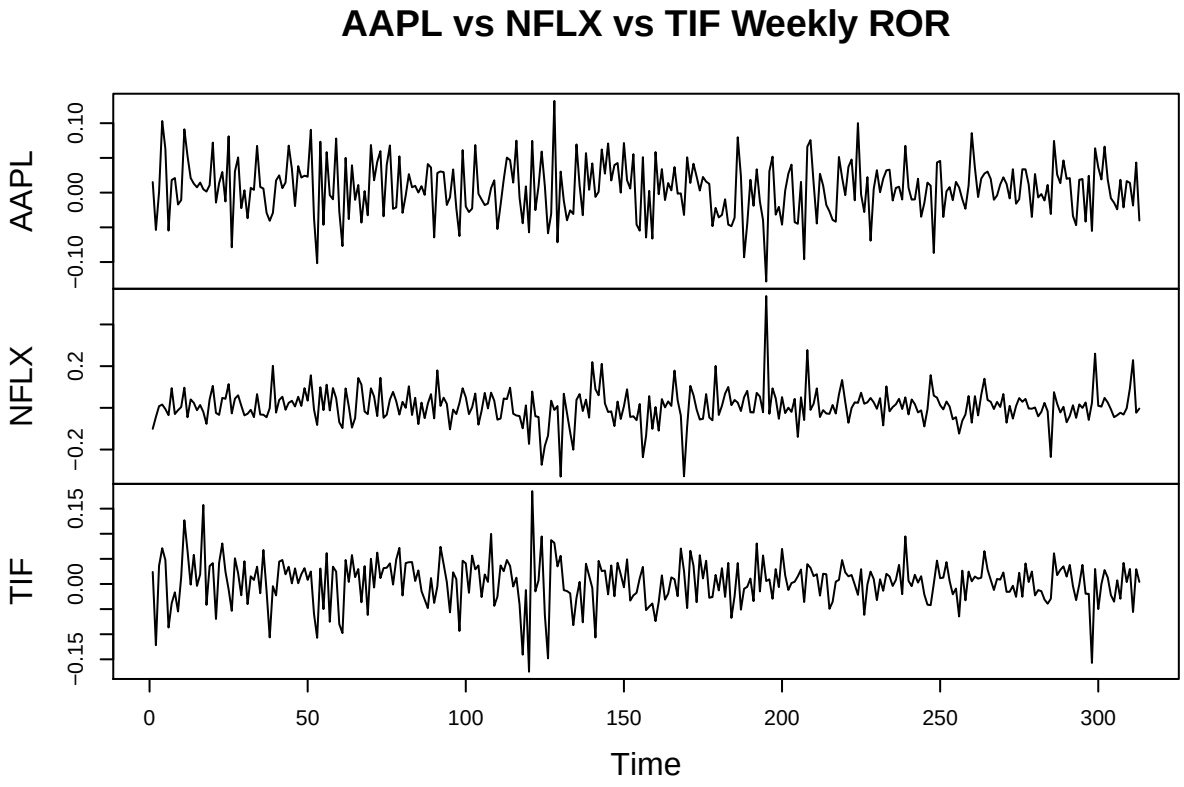



```
aaplDaily <- normalReturn(aaplDaily)
nflxDaily <- normalReturn(nflxDaily)
tifDaily <- normalReturn(tifDaily)

plot.ts(aaplDaily$normalReturn, type = "l", ylab = "xOriginal Price",main = "AAPL vs NFLX vs TIF Daily G
lines(nflxDaily$normalReturn, col = "red")
lines(tifDaily$normalReturn, col = "blue")
legend("topleft", c("aapl","nflx", "tif"), pch=1, col=c('black', 'red', "blue"),
       lty=1, cex=.75)
```

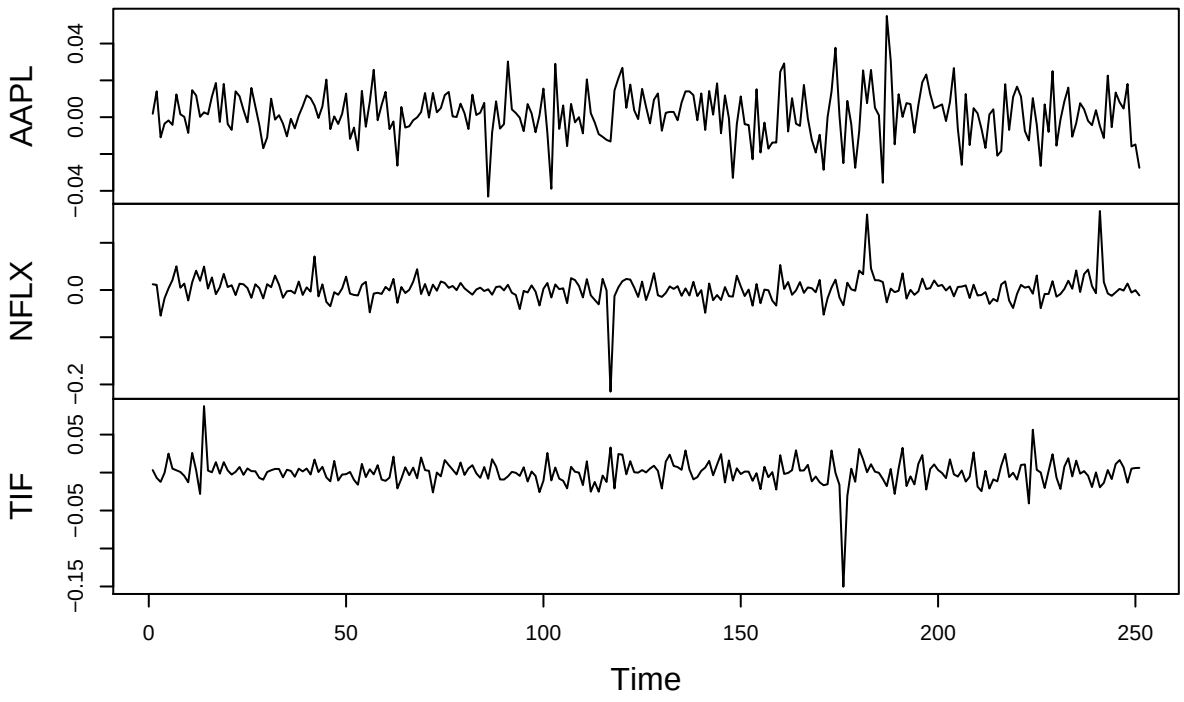


b

```
logRateReturn <- function(x){
  x$logReturn <- c(NA, diff(log(x$Adj.Close)))
  x
}

aapl <- logRateReturn(aapl)
nflx <- logRateReturn(nflx)
tif <- logRateReturn(tif)

weeklyReturns = data.frame(AAPL = aapl$logReturn[-1], NFLX = nflx$logReturn[-1], TIF = tif$logReturn[-1

plot.ts(weeklyReturns, type = "l", ylab = "Rate Of Return",main = "AAPL vs NFLX vs TIF Weekly ROR", col
```




```
aaplDaily <- logRateReturn(aaplDaily)
nflxDaily <- logRateReturn(nflxDaily)
tifDaily <- logRateReturn(tifDaily)

dailyReturns = data.frame(AAPL = aaplDaily$logReturn[-1], NFLX = nflxDaily$logReturn[-1], TIF = tifDaily

plot.ts(dailyReturns, type = "l", ylab = "Rate Of Return",main = "AAPL vs NFLX vs TIF Daily ROR", col =
```



c

```
annualNormalSdWeekly <- function(x){
   sd(x[-1])*sqrt(52)
}

annualNormalSdDaily <- function(x){
  sd(x[-1])*sqrt(256)
}


sds <- cat("AAPl: ", annualNormalSdWeekly(aapl$logReturn), "\nNFLX: ", annualNormalSdWeekly(nflx$logRetu
annualNormalSdWeekly(tifDaily$logReturn), "\nAAPl Daily: ",
annualNormalSdDaily(aaplDaily$logReturn), "\nNFLX Daily: ",
annualNormalSdDaily(nflxDaily$logReturn), "\nTIF Daily: ",
annualNormalSdDaily(tifDaily$logReturn), "\n")
```

```
## AAPl:  0.2831915
## NFLX:  0.5952621
## TIF:  0.1245455
## AAPl Daily:  0.2151465
## NFLX Daily:  0.4398746
## TIF Daily:  0.2763416
```