

5241 HW1

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Problem 3

1

```
library(quantmod)
```

```
## Loading required package: xts
```

```
## Loading required package: zoo
```

```
##  
## Attaching package: 'zoo'
```

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

```
## Loading required package: TTR
```

```
## Version 0.4-0 included new data defaults. See ?getSymbols.
```

```
library(TTR)  
index=c("DWDP", "AAPL", "GS", "NKE", "V", "UNH", "CSCO", "TRV", "CVX", "PFE", "VZ", "HD", "INTC",  
"MSFT", "JNJ", "WMT", "CAT", "JPM", "DIS", "BA", "KO", "MCD", "AXP", "IBM", "MRK", "MMM", "UTX", "P  
G", "XOM", "GE")  
data=matrix(data=rep(0,251*30),nrow = 251)  
for(i in 1:30){  
  sub_index=index[i]  
  data[,i]=getSymbols( sub_index, auto.assign = F, from = "2017-01-01", to = "2018-01-  
-01")[,4]  
}
```

```
## '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).
```

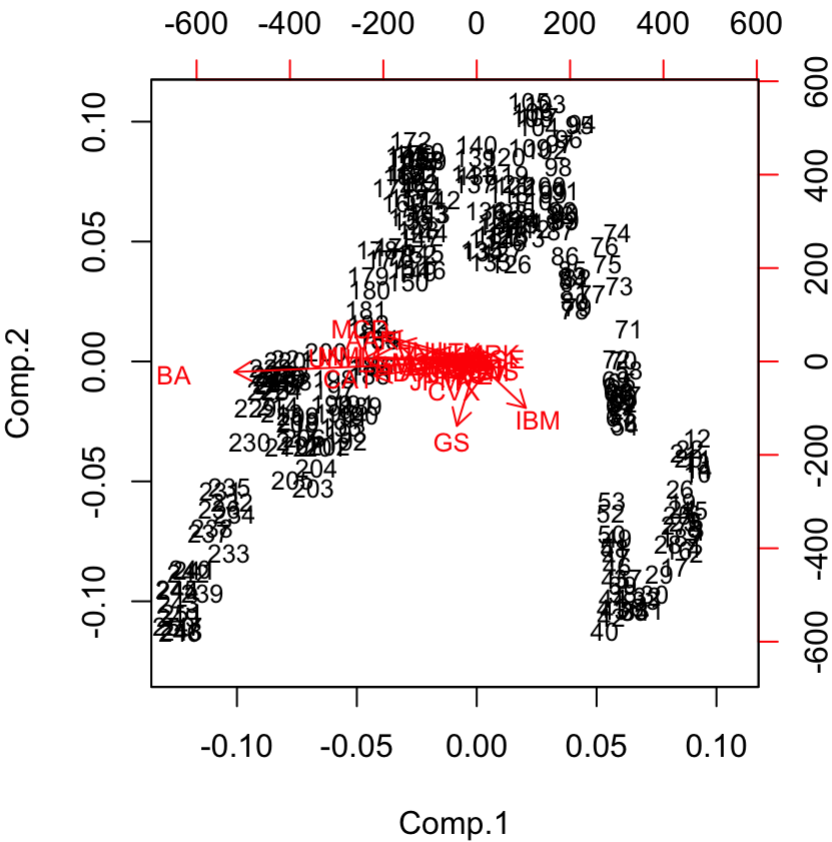
```
colnames(data)<-c("DWDP","AAPL","GS","NKE","V","UNH","CSCO","TRV","CVX","PFE","VZ","H
D","INTC","MSFT","JNJ","WMT","CAT","JPM","DIS","BA","KO","MCD","AXP","IBM","MRK","MM
M","UTX","PG","XOM","GE")
```

2

```
pr.out=princomp(data,cor=FALSE)
pr.out
```

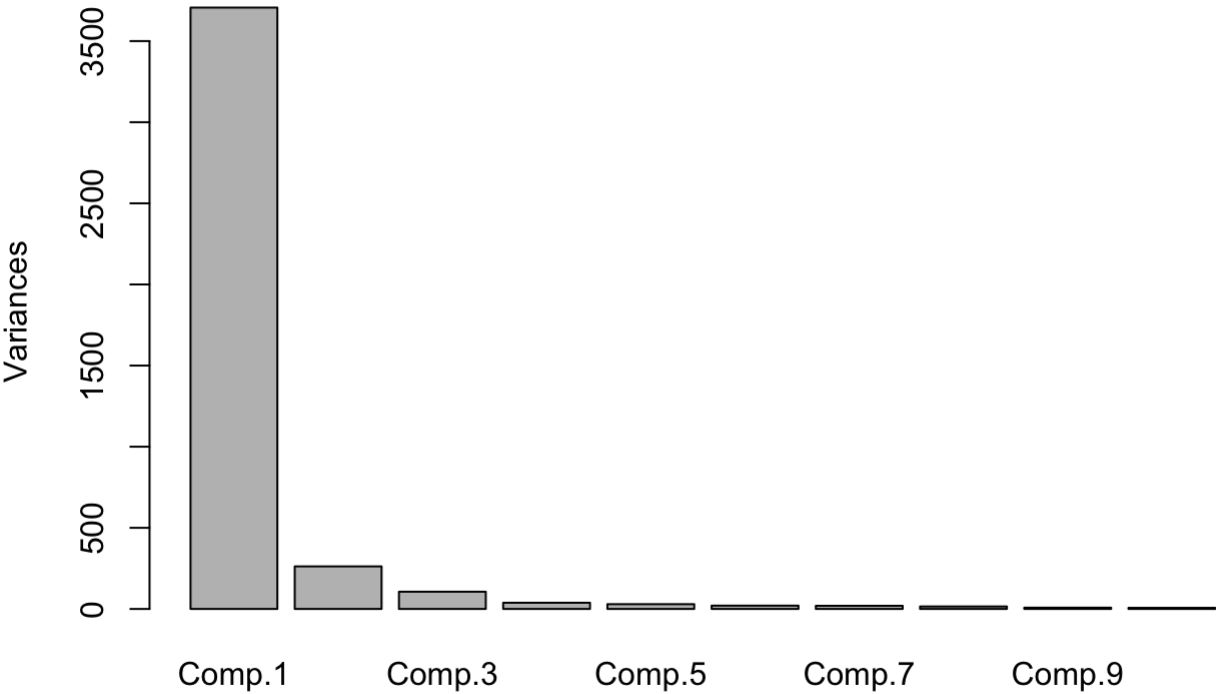
```
## Call:
## princomp(x = data, cor = FALSE)
##
## Standard deviations:
##      Comp.1      Comp.2      Comp.3      Comp.4      Comp.5      Comp.6
## 60.8802452 16.1970741 10.3067294  6.1823152  5.4295060  4.5191911
##      Comp.7      Comp.8      Comp.9      Comp.10     Comp.11     Comp.12
##  4.4083876  3.9253463  2.8145307  2.6223740  2.2544595  1.7810330
##      Comp.13     Comp.14     Comp.15     Comp.16     Comp.17     Comp.18
##  1.4786949  1.4001827  1.3081533  1.2587104  1.1518026  1.0465861
##      Comp.19     Comp.20     Comp.21     Comp.22     Comp.23     Comp.24
##  0.9901122  0.9015490  0.7924428  0.6996034  0.6086937  0.5267060
##      Comp.25     Comp.26     Comp.27     Comp.28     Comp.29     Comp.30
##  0.5010247  0.4860420  0.4725970  0.3739478  0.3130792  0.2610486
##
## 30 variables and 251 observations.
```

```
biplot(pr.out,cex=0.8)
```



```
screepplot(pr.out,npcs = min(10,length(pr.out$sdev)),type = "barplot")
```

pr.out

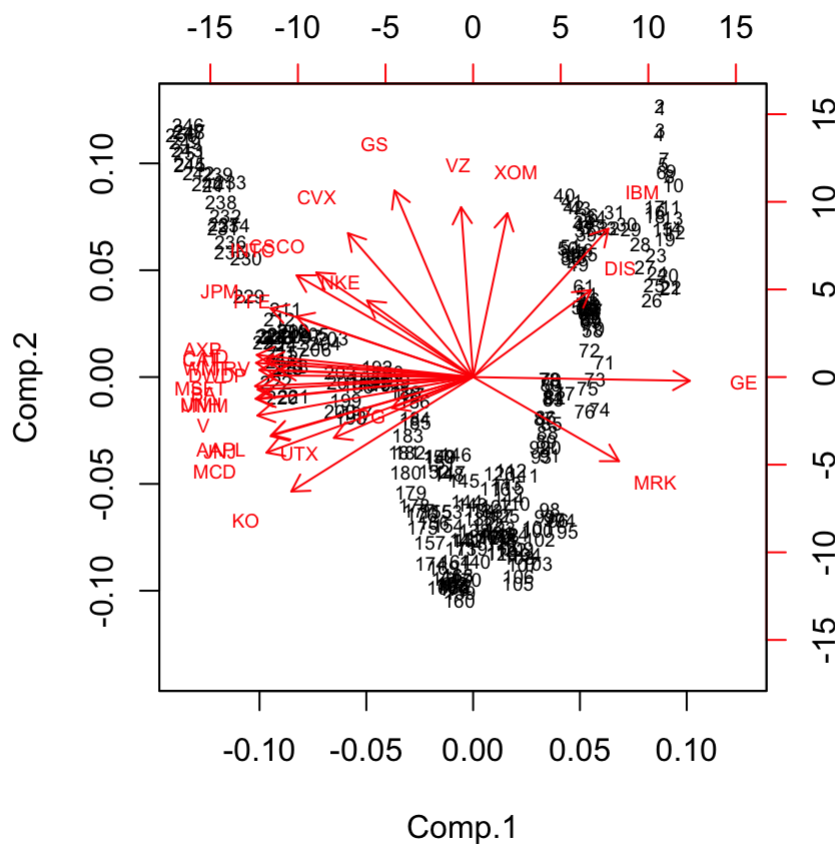


3

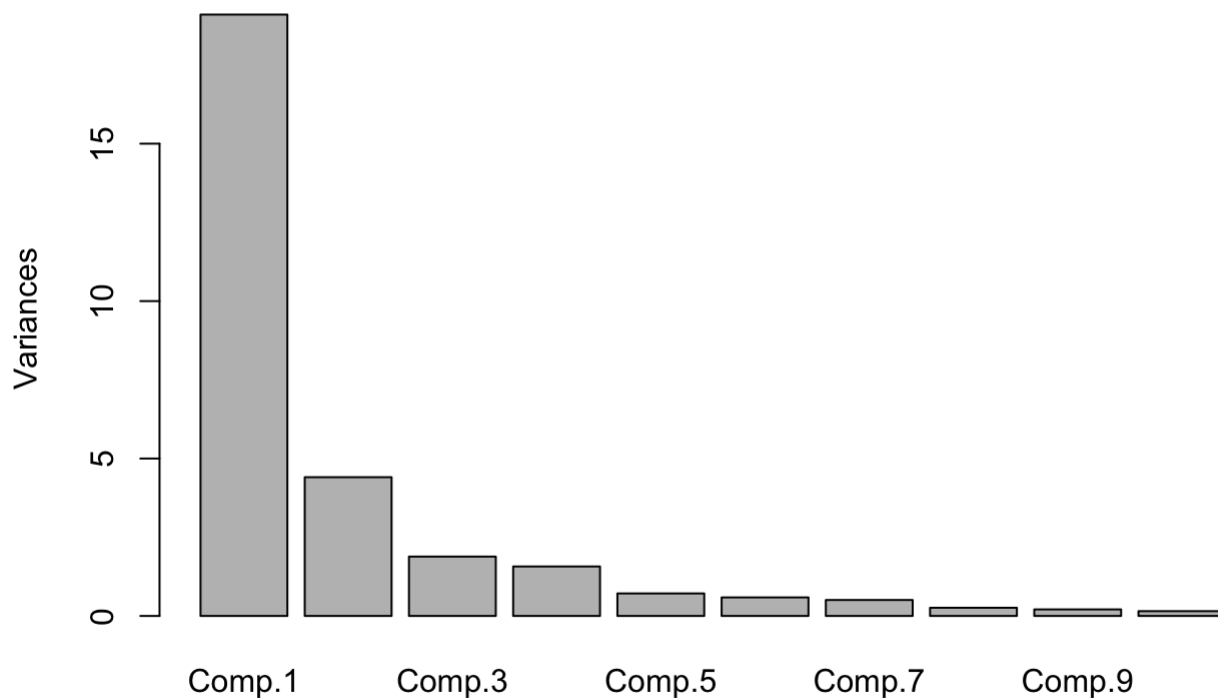
```
pr.out1=princomp(data,cor=TRUE)
pr.out1
```

```
## Call:
## princomp(x = data, cor = TRUE)
##
## Standard deviations:
##      Comp.1      Comp.2      Comp.3      Comp.4      Comp.5      Comp.6
## 4.37035730 2.09933314 1.37312336 1.25364941 0.84567370 0.76734140
##      Comp.7      Comp.8      Comp.9      Comp.10     Comp.11     Comp.12
## 0.71208084 0.50995272 0.45575055 0.39045029 0.32975718 0.30531486
##      Comp.13     Comp.14     Comp.15     Comp.16     Comp.17     Comp.18
## 0.26345908 0.24870245 0.21376114 0.20372338 0.18209734 0.16455520
##      Comp.19     Comp.20     Comp.21     Comp.22     Comp.23     Comp.24
## 0.14991800 0.13608916 0.13199112 0.11178907 0.10992946 0.09878426
##      Comp.25     Comp.26     Comp.27     Comp.28     Comp.29     Comp.30
## 0.08923231 0.07679551 0.07479149 0.07031624 0.05922717 0.05573851
##
## 30 variables and 251 observations.
```

```
biplot(pr.out1,cex=0.6)
```



```
screplot(pr.out1,npcs=min(10,length(pr.out1$sdev)),type="barplot")
```

pr.out1**4**

```
dim(data)
```

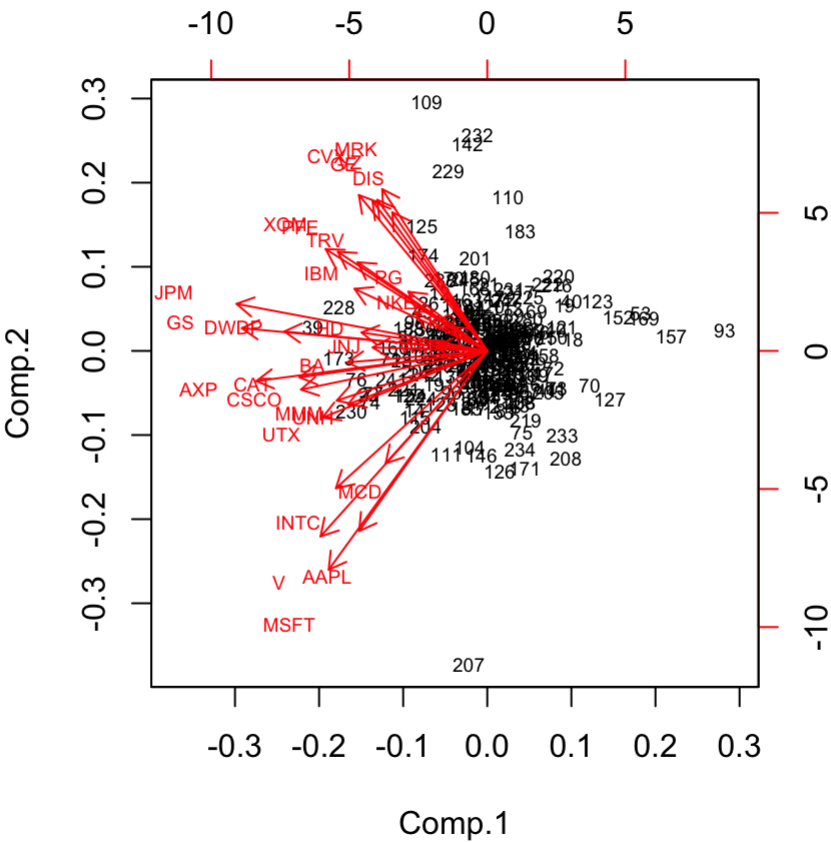
```
## [1] 251 30
```

```
returndata=matrix(data=rep(0,250*30),nrow = 250)
for(i in 1:30){
  returndata[,i]= (data[-1,i]/data[-251,i])-1
}
colnames(returndata)<-c("DWDP","AAPL","GS","NKE","V","UNH","CSCO","TRV","CVX","PFE",
"VZ","HD","INTC","MSFT","JNJ","WMT","CAT","JPM","DIS","BA","KO","MCD","AXP","IBM","MR
K","MMM","UTX","PG","XOM","GE")

dim(returndata)
```

```
## [1] 250 30
```

```
pr.out2=princomp(returndata,cor=TRUE)
biplot(pr.out2,cex=0.6)
```



```
screepLOT(pr.out2,npcs=min(10,length(pr.out2$sdev)),type="barplot")
```

pr.out2

