1. 考虑从 2001 年 9 月 1 日到 2011 年 9 月 30 日美国运通公司(AXP)、CRSP 价值权重指数(VW)、CRSP 的等权重指数(EW)以及 S&P 综合指数的日简单收益率. 收益率中包含有支付的股息. 数据来自 d-axp3dx-0111.txt(date, axp, vw, ew, sp).

(a) 计算每个收益率序列的样本均值、标准差、偏度、超额峰度、最大值和最小值.

(b) 把简单收益率转换成对数收益率. 计算每个对数收益率的样本均值、标准差、偏度、超额峰度、最大值和最小值.

(a)

```
library("fBasics")
x<-read.table("E:/DATA/data mining/fts01/d-axp3dx-0111.txt",header=T)
head(x)
basicStats(x$axp)
basicStats(x$vw)
basicStats(x$ew)
basicStats(x$sp)
```

```
> library("fBasics")
> x<-read.table("E:/DATA/data mining/fts01/d-axp3dx-0111.txt",header
=T)
> head(x)
      date       axp        vw        ew        sp
1 20010904  0.000824 -0.001658 -0.005708 -0.000565
2 20010905  0.007682 -0.003242 -0.008926 -0.001059
3 20010906 -0.039477 -0.020733 -0.014187 -0.022390
4 20010907 -0.019274 -0.017769 -0.011476 -0.018637
5 20010910  0.011850  0.003513 -0.007368  0.006226
6 20010917 -0.135961 -0.050714 -0.042398 -0.049216
```

```
> basicStats(x$axp)
               X..x.axp
nobs        2535.000000
NAs            0.000000
Minimum       -0.175949
Maximum        0.206485
1. Quartile   -0.009672
3. Quartile    0.010540
Mean           0.000534
Median         0.000000
Sum            1.353560
SE Mean        0.000524
LCL Mean      -0.000493
UCL Mean       0.001561
Variance       0.000695
Stdev          0.026368
Skewness       0.459773
Kurtosis       9.592053
```

均值 0.000534、标准差 0.000524、偏度 0.459773、超额峰度 9.592053、最大值 0.206485 和最小值-0.175949

```
> basicStats(x$vw)
                X..x.vw
nobs        2535.000000
NAs            0.000000
Minimum       -0.089762
Maximum        0.114889
1. Quartile   -0.005473
3. Quartile    0.006212
Mean           0.000224
Median         0.000848
Sum            0.567996
SE Mean        0.000271
LCL Mean      -0.000308
UCL Mean       0.000756
Variance       0.000186
Stdev          0.013652
Skewness      -0.098318
Kurtosis       7.982134
```

均值 0.000224、标准差 0.000271、偏度-0.098318、超额峰度 7.982134、最大值 0.114889 和最小值-0.089762

```
> basicStats(x$ew)
                X..x.ew
nobs        2535.000000
NAs            0.000000
Minimum       -0.078240
Maximum        0.107422
1. Quartile   -0.004630
3. Quartile    0.006402
Mean           0.000626
Median         0.001429
Sum            1.586462
SE Mean        0.000240
LCL Mean       0.000155
UCL Mean       0.001096
Variance       0.000146
Stdev          0.012080
Skewness      -0.247410
Kurtosis       8.108428
```

均值 0.000626、标准差 0.000240、偏度-0.247410、超额峰度 8.108428、最大值 0.107422 和最小值-0.078240

```
> basicStats(x$sp)
                 X..x.sp
nobs         2535.000000
NAs             0.000000
Minimum        -0.090350
Maximum         0.115800
1. Quartile    -0.005798
3. Quartile     0.006117
Mean            0.000094
Median          0.000700
Sum             0.238869
SE Mean         0.000274
LCL Mean       -0.000442
UCL Mean        0.000631
Variance        0.000190
Stdev           0.013779
Skewness        0.008152
Kurtosis        8.532667
```

均值 0.000094、标准差 0.000274、偏度 0.008152、超额峰度 8.532667、最大值 0.115800 和最小值-0.090350

(b)

```
logx<-log(x[2:5]+1)#转为对数收益率
basicStats(logx$axp)
basicStats(logx$vw)
basicStats(logx$ew)
basicStats(logx$sp)
```

```
> basicStats(logx$axp)
             X..logx.axp
nobs         2535.000000
NAs             0.000000
Minimum        -0.193523
Maximum         0.187711
1. Quartile    -0.009719
3. Quartile     0.010484
Mean            0.000188
Median          0.000000
Sum             0.476584
SE Mean         0.000522
LCL Mean       -0.000836
UCL Mean        0.001212
Variance        0.000691
Stdev           0.026294
Skewness        0.020992
Kurtosis        9.020499
```

均值 0.000188、标准差 0.000522、偏度 0.020992、超额峰度 9.020499、最大值 0.187711 和最小值-0.193523

```
> basicStats(logx$vw)
               X..logx.vw
nobs          2535.000000
NAs              0.000000
Minimum         -0.094049
Maximum          0.108755
1. Quartile     -0.005489
3. Quartile      0.006193
Mean             0.000131
Median           0.000848
Sum              0.331452
SE Mean          0.000272
LCL Mean        -0.000402
UCL Mean         0.000663
Variance         0.000187
Stdev            0.013670
Skewness        -0.300352
Kurtosis         7.880082
```

均值 0.000131、标准差 0.000272、偏度-0.300352、超额峰度 7.880082、最大值 0.108755 和最小值-0.094049

```
> basicStats(logx$ew)
               X..logx.ew
nobs          2535.000000
NAs              0.000000
Minimum         -0.081470
Maximum          0.102035
1. Quartile     -0.004641
3. Quartile      0.006382
Mean             0.000553
Median           0.001428
Sum              1.400780
SE Mean          0.000240
LCL Mean         0.000081
UCL Mean         0.001024
Variance         0.000146
Stdev            0.012100
Skewness        -0.427315
Kurtosis         8.017712
```

均值 0.000553、标准差 0.000240、偏度-0.427315、超额峰度 8.017712、最大值 0.102035 和最小值-0.081470

```
> basicStats(logx$sp)
               X..logx.sp
nobs          2535.000000
NAs              0.000000
Minimum         -0.094695
Maximum          0.109572
1. Quartile     -0.005815
3. Quartile      0.006098
Mean            -0.000001
Median           0.000700
Sum             -0.001898
SE Mean          0.000274
LCL Mean        -0.000538
UCL Mean         0.000536
Variance         0.000190
Stdev            0.013790
Skewness        -0.206357
Kurtosis         8.322826
```

均值 -0.000001、标准差 0.000274、偏度-0.206357、超额峰度 8.322826、最大值 0.109572 和最小值-0.094695