ShinyStockLP.R

dev — *Feb 2, 2014, 7:46 AM*

```r
rm(list=ls(all=TRUE))
setwd("/home/dev/work/Insofe/Mini-Project-2/ShinyStockPortfolio")

#Define Risk Profiles in the order Lo, Med, Hi risk distr

profile.conservative <- c(0.5, 0.3, 0.2)
profile.moderate <- c(0.3,0.4,0.3)
profile.aggressive <- c(0.2,0.3,0.5)

profile.sel <- profile.aggressive

#Read the returns data from returns file
stock.returns <- read.csv("StockReturns.csv")
colnames(stock.returns)[1] <- "Name"
stock.returns
```

```
                  Name      Mean     Median    SD
1         Asian Paints.csv -0.066305  0.058071 4.304
2        Bharati Airtel.csv -0.004927 -0.089526 2.229
3                 BHEL.csv -0.126235 -0.098542 2.742
4                Cipla.csv  0.067307 -0.024994 1.470
5       Coal INDIA Ltd.csv -0.025326 -0.014180 1.669
6                  DLF.csv -0.051774 -0.063735 2.933
7           Dr. Reddy's.csv  0.087178  0.025892 1.333
8             HDFC Bank.csv  0.067350  0.008551 1.622
9    Hero Motor Corp Ltd.csv  0.001940 -0.014913 1.741
10           ICICI Bank.csv  0.049827  0.000000 2.129
11                  ITC.csv  0.090634  0.132100 1.520
12          Jindal Steel.csv -0.123564 -0.046079 2.631
13                   LT.csv -0.038955 -0.115722 2.557
14  Mahindra & Mahindra.csv  0.037448  0.025913 1.756
15         Maruti Suzuki.csv  0.091542 -0.039533 1.955
16                 ONGC.csv  0.012018 -0.128370 1.860
```

```
17             SBI.csv   0.007124   0.063199 2.091
18      Tata Motors.csv   0.160750   0.031447 2.371
19       Tata Steel.csv  -0.013903  -0.117130 2.326
20              TCS.csv   0.126142   0.119760 1.607
21  Ultra Tech Cements.csv   0.106359   0.078967 1.635
```

```r
#Select any 5 stocks
num.stocks <- 5
sel.stocks <- stock.returns[sample(1:nrow(stock.returns),num.stocks,replace=FALSE),]

#Order the data based on Risk
sel.stocks <- sel.stocks[order(sel.stocks$SD),]
sel.stocks
```

```
              Name      Mean   Median    SD
16          ONGC.csv  0.012018 -0.12837 1.860
15 Maruti Suzuki.csv  0.091542 -0.03953 1.955
17           SBI.csv  0.007124  0.06320 2.091
10    ICICI Bank.csv  0.049827  0.00000 2.129
1   Asian Paints.csv -0.066305  0.05807 4.304
```

```r
#Bin the Risk
library(infotheo)
risk.level <- discretize(sel.stocks$SD,disc="equalfreq", nbins=3)
colnames(risk.level) <- "RiskLevel"
sel.stocks$RiskLevel <- risk.level
head(sel.stocks)
```

```
              Name      Mean   Median    SD RiskLevel
16          ONGC.csv  0.012018 -0.12837 1.860         1
15 Maruti Suzuki.csv  0.091542 -0.03953 1.955         1
17           SBI.csv  0.007124  0.06320 2.091         2
10    ICICI Bank.csv  0.049827  0.00000 2.129         3
1   Asian Paints.csv -0.066305  0.05807 4.304         3
```

```r
#Define objective functions
obj <- sel.stocks$Mean

#Define constraints
w1 <- c(1,0,0,0,0)
w2 <- c(0,1,0,0,0)
w3 <- c(0,0,1,0,0)
w4 <- c(0,0,0,1,0)
w5 <- c(0,0,0,0,1)
weights <- data.frame(cbind(w1,w2,w3,w4,w5))
sum.weights <- apply(weights,1,sum)

min.weight <- 0.05 # Minimum investment in each stock

#Low Risk
lo.risk <- apply(weights[which(sel.stocks$RiskLevel==1)],1,sum)
#Med Risk
med.risk <- apply(weights[which(sel.stocks$RiskLevel==2)],1,sum)
#Hi Risk
hi.risk <- apply(weights[which(sel.stocks$RiskLevel==3)],1,sum)

cons <- rbind(w1, w2, w3, w4, w5, sum.weights, lo.risk, med.risk, hi.risk)
dir <- c(rep(">=", 5), "=",  "<=", "<=", "<=")
rhs <- c(rep(min.weight,5), 1, profile.sel[1], profile.sel[2], profile.sel[3])
library(lpSolve)
res <- lp("max", obj, cons, dir, rhs, compute.sens=0)
if (sum(res$solution) == 0) {
  res
} else {
  output <- cbind(sel.stocks,res$solution)
  cat("Invest as follows: \n")
  print(output)

  # Let's plot a chart of dist
  #Plot settings, Font size 1.25x times
  par(mfrow=c(1,1),cex.main=1, cex.axis=1)
  chart.title <- paste("Investment Weights based on LP")
  barplot(res$solution, names=substr(sel.stocks$Name, 1, 6), main=chart.title, col=rainbow(13:15))
}
```

```
Invest as follows:
                Name       Mean    Median    SD RiskLevel res$solution
16         ONGC.csv   0.012018 -0.12837 1.860         1        0.05
15 Maruti Suzuki.csv   0.091542 -0.03953 1.955         1        0.15
17          SBI.csv   0.007124  0.06320 2.091         2        0.30
10    ICICI Bank.csv   0.049827  0.00000 2.129         3        0.45
1   Asian Paints.csv -0.066305  0.05807 4.304         3        0.05
```

Investment Weights based on LP