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

# Define Risk Profiles in the order Lo, Med, Hi risk distr
profile.conservative <- c(0.5, 0.3, 0.2)
profile.moderate <- c(0.2, 0.5, 0.3)
profile.aggressive <- c(0.2, 0.2, 0.6)

risk.df <- rbind(profile.conservative, profile.moderate, profile.aggressive)
colnames(risk.df) <- c("Low", "Med", "High")
rownames(risk.df) <- c("Conservative", "Moderate", "Aggressive")
risk.df
```

```
##              Low Med High
## Conservative 0.5 0.3  0.2
## Moderate     0.2 0.5  0.3
## Aggressive   0.2 0.2  0.6
```

```
# 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           DLF.csv -0.051774 -0.06373 2.933
## 2       Ranbaxy.csv  0.008046 -0.03935 3.010
## 3 Maruti Suzuki.csv  0.091542 -0.03953 1.955
## 4           SBI.csv  0.007124  0.06320 2.091
## 5  Asian Paints.csv -0.066305  0.05807 4.304
```

```
# 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
## 3 Maruti Suzuki.csv  0.091542 -0.03953 1.955
## 4           SBI.csv  0.007124  0.06320 2.091
## 1           DLF.csv -0.051774 -0.06373 2.933
## 2       Ranbaxy.csv  0.008046 -0.03935 3.010
## 5  Asian Paints.csv -0.066305  0.05807 4.304
```

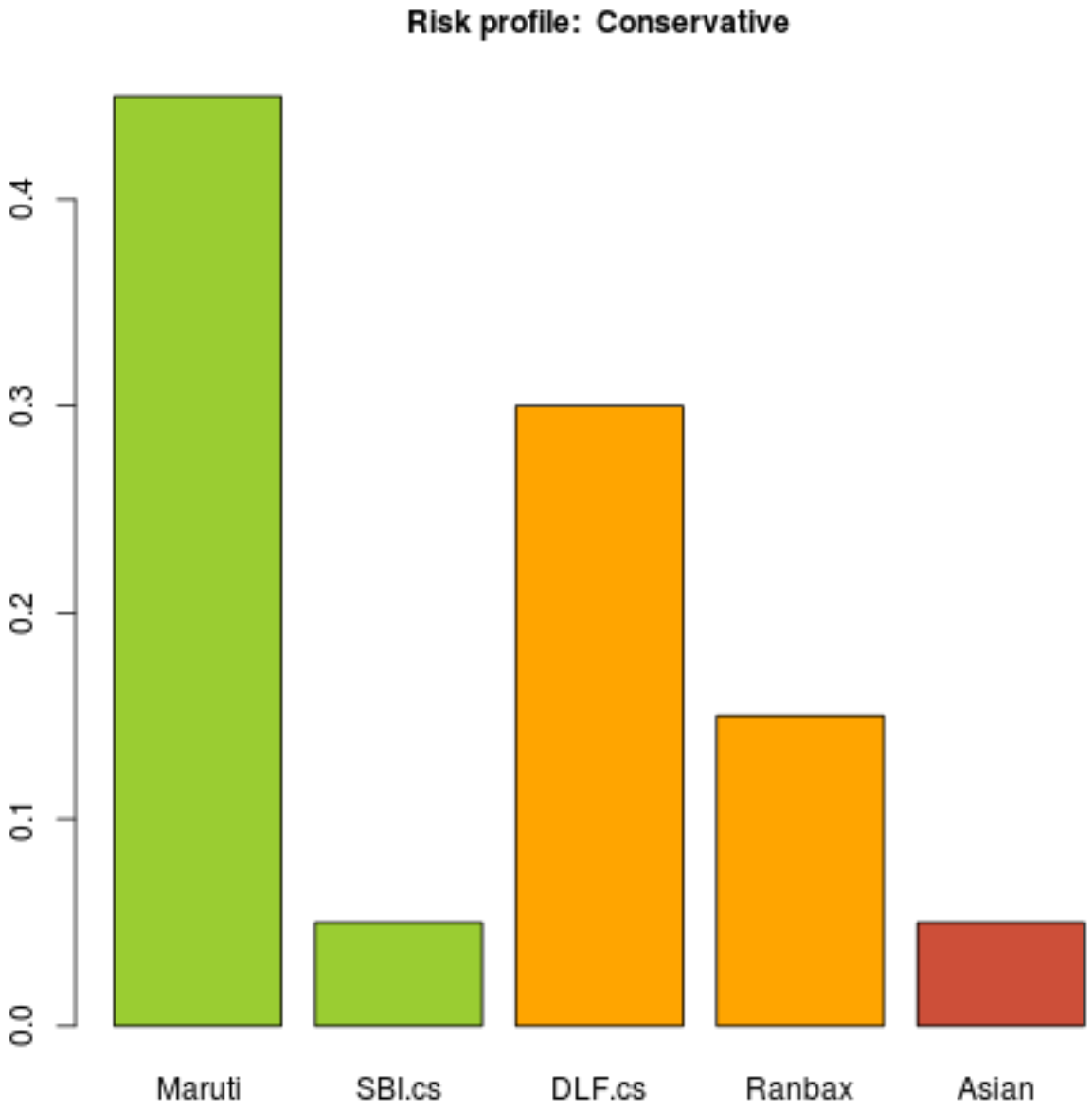
```
# Chart plot settings
par(mfrow = c(1, 1), cex.main = 1, cex.axis = 1)

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

```
##                Name      Mean   Median    SD RiskLevel
## 3 Maruti Suzuki.csv  0.091542 -0.03953 1.955         1
## 4           SBI.csv  0.007124  0.06320 2.091         1
## 1           DLF.csv -0.051774 -0.06373 2.933         2
## 2       Ranbaxy.csv  0.008046 -0.03935 3.010         3
## 5  Asian Paints.csv -0.066305  0.05807 4.304         3
```

```
# 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)
```

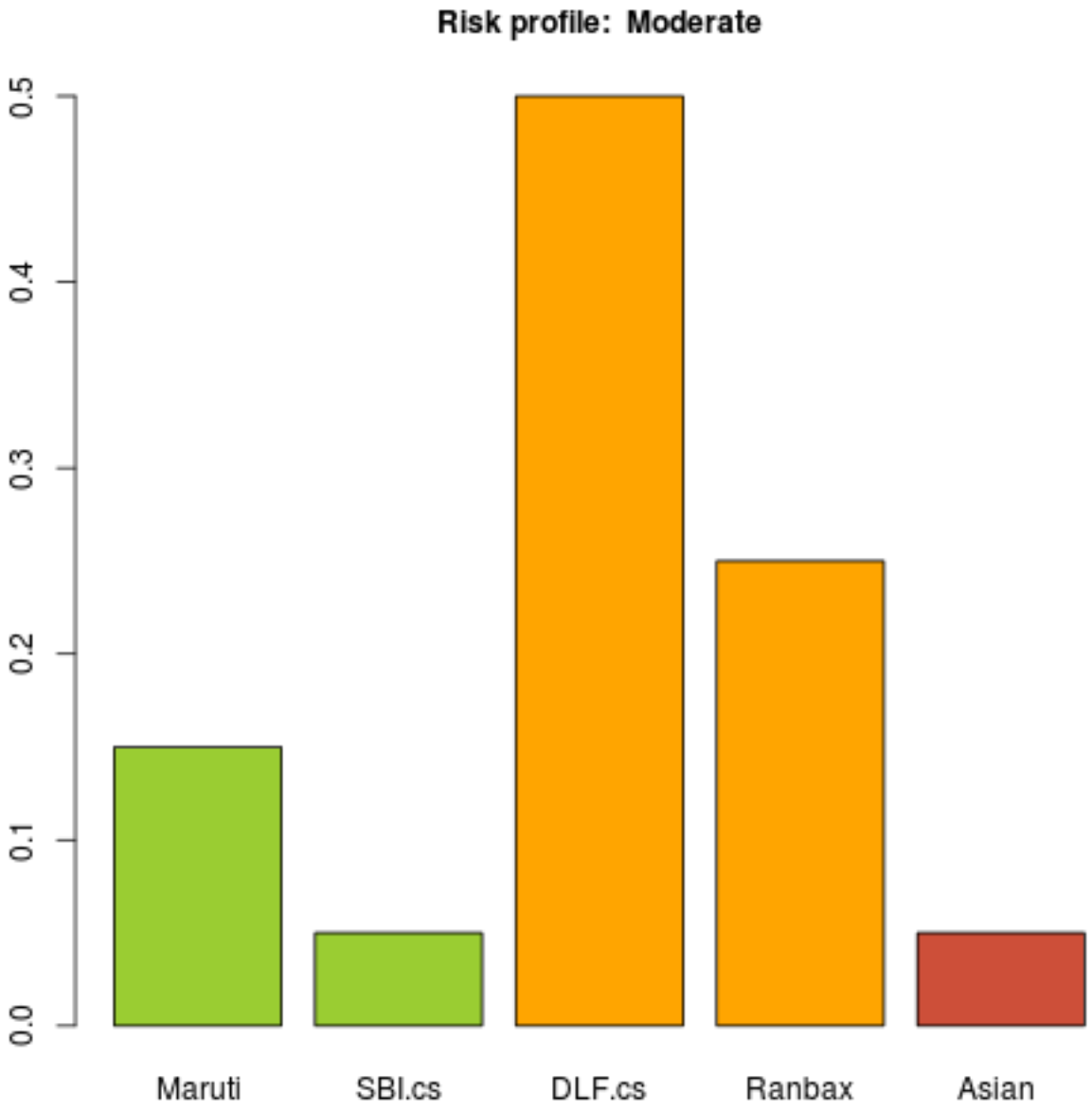
```r
w5 <- c(0, 0, 0, 0, 1)
weights <- data.frame(cbind(w1, w2, w3, w4, w5))
sum.weights <- apply(weights, 1, sum)

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)

i <- 1

# For each risk profile calculate the recommended dist
for (i in 1:nrow(risk.df)) {
    # Define objective function
    obj <- sel.stocks$Mean
    cons <- rbind(w1, w2, w3, w4, w5, sum.weights, lo.risk, med.risk, hi.risk)
    dir <- c(rep(">=", 5), "=", "<=", "<=", "<=")
    rhs <- c(rep(min.weight, 5), 1, risk.df[i, 1], risk.df[i, 2], risk.df[i,
        3])
    res <- lp("max", obj, cons, dir, rhs, compute.sens = 0)
    if (sum(res$solution) == 0) {
        res
    } else {
        output <- cbind(sel.stocks, res$solution)
        cat("Invest as follows for risk profile: ", rownames(risk.df)[i], "\n")
        print(output)

        chart.title <- paste("Risk profile: ", rownames(risk.df)[i])
        bar.colors <- c("yellowgreen", "yellowgreen", "orange", "orange", "tomato3",
            "tomato3")
        barplot(res$solution, names = substr(sel.stocks$Name, 1, 6), main = chart.title,
            col = bar.colors)
    }
    i <- i + 1
}
```

```
## Invest as follows for risk profile:  Conservative
##                Name      Mean   Median    SD RiskLevel res$solution
## 3 Maruti Suzuki.csv  0.091542 -0.03953 1.955         1         0.45
## 4           SBI.csv  0.007124  0.06320 2.091         1         0.05
## 1           DLF.csv -0.051774 -0.06373 2.933         2         0.30
## 2       Ranbaxy.csv  0.008046 -0.03935 3.010         3         0.15
## 5  Asian Paints.csv -0.066305  0.05807 4.304         3         0.05
```




```
## Invest as follows for risk profile:  Moderate
##                Name      Mean   Median    SD RiskLevel res$solution
## 3 Maruti Suzuki.csv  0.091542 -0.03953 1.955         1         0.15
```

```
## 4           SBI.csv  0.007124  0.06320 2.091         1         0.05
## 1           DLF.csv -0.051774 -0.06373 2.933         2         0.50
## 2       Ranbaxy.csv  0.008046 -0.03935 3.010         3         0.25
## 5  Asian Paints.csv -0.066305  0.05807 4.304         3         0.05
```




```
## Invest as follows for risk profile:  Aggressive
##                Name      Mean   Median    SD RiskLevel res$solution
## 3 Maruti Suzuki.csv  0.091542 -0.03953 1.955         1         0.15
```

```
## 4           SBI.csv  0.007124  0.06320 2.091         1         0.05
## 1           DLF.csv -0.051774 -0.06373 2.933         2         0.20
## 2       Ranbaxy.csv  0.008046 -0.03935 3.010         3         0.55
## 5  Asian Paints.csv -0.066305  0.05807 4.304         3         0.05
```