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Department of Statistics

Statistics C183/C283 **Instructor: Nicolas Christou**

Project

Select 30 stocks (plus the market $S\&P500$) from `http://finance.yahoo.com`. Please select stocks from 5 industries. To find the industry in which each stock belongs go to `https://finance.yahoo.com/industries`. To construct your portfolios use monthly data from 01-Jan-2012 to 01-Jan-2017 (5 years). For the testing period use monthly data from 01-Jan-2017 to 31-Mar-2020. Make sure that you have data available for all your stocks for the entire period, 01-Jan-2012 to 31-Mar-2020.

Project 1
Things to do:

a. Use `http://shiny.stat.ucla.edu:3838/c183c283/` Enter the tickers as follows: `^GSPC,AAPL,IBM,....`

b. You will download the adjusted close prices for 30 stocks plus the $S\&P500$ in a csv file. Import the data in `R` and convert the adjusted close prices into returns. (Use the first 5-year data only!)

c. Compute the means of the 31 assets, the standard deviations, and the variance covariance matrix.

d. Plot the 31 assets on the space expected return against standard deviation.

e. Assume equal allocation portfolio using the 30 stocks. Compute the mean and standard deviation of this portfolio and add it on the plot of question (c).

f. Add on the plot the minimum risk portfolio.

Few `R` commands to begin the project:

```
#Read your csv file:
a <- read.csv("stockData.csv", sep=",", header=TRUE)

#Convert adjusted close prices into returns:
r <- (a[-1,3:ncol(a)]-a[-nrow(a),3:ncol(a)])/a[-nrow(a),3:ncol(a)]

#Compute mean vector:
means <- colMeans(r[-1])  #Without ^GSPC

#Compute variance covariance matrix:
covmat <- cov(r[-1])  #Without ^GSPC

#Compute correlation matrix:
cormat <- cor(r[-1])   #Without ^GSPC

#Compute the vector of variances:
variances <- diag(covmat)

#Compute the vector of standard deviations:
stdev <- diag(covmat)^.5
```