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## **FIN 740 – Fall AP1 2020**

### **Homework 4**

**Due: Sunday, September 27, 11:59 PM CST**

※ **Using the R script, answer the following questions. Please show all works for full credit.**

Download the data file **hw4.csv** from M4: Homework section on Moodle and create “**hw4**” by reading **hw4.csv** file. The **hw4.csv** includes **monthly** log stock returns of 8 firms **from January 2006 to December 2016**. Use the following package and libraries:

```
install.packages("tseries")  
library(tseries)  
library(xts).
```

1. [4 points] Convert “**hw4**” to xts object (use date format “**%m/%d/%Y**”) and assign the name “**rtn**” to the new object.
2. Find mean-variance efficient portfolio with target return 0.5%, and answer the following questions (Note: Print out the **corresponding answers only**).
  - a) [4 points] What is the weights of mean-variance efficient portfolio?
  - b) [4 points] What is the expected portfolio returns for each month obtained by a) ?
  - c) [4 points] What is the standard deviation of mean-variance portfolio.
3. [32 points] Find (Plot) efficient frontier.
4. Suppose that risk-free T-bill rate is 0.2%.
  - a) [6 points] Find maximum Sharpe ratio.
  - b) [6 points] Find tangency point, and plot Capital Allocation Line (CAL).