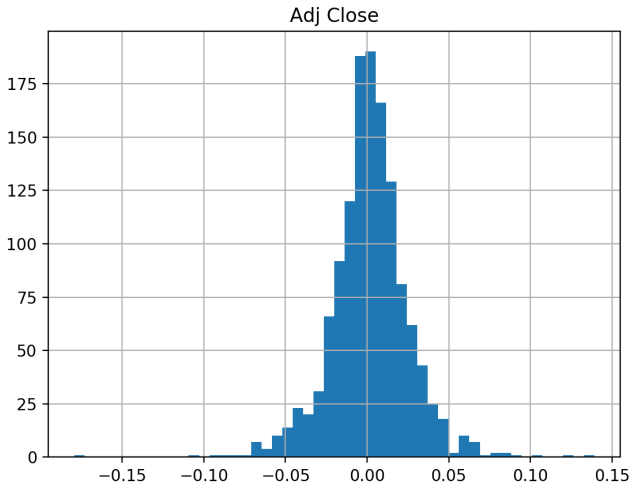
Feel free to work with other students, but make sure you write up the homework and code on your own (no copying homework *or* code; no pair programming). Feel free to ask students or instructors for help debugging code or whatever else, though.

Note: You need to create a Github account for submission of the coding part of the homework. Please create a repository on Github to hold all your code and include your Github account username as part of the answer to the coding problems.

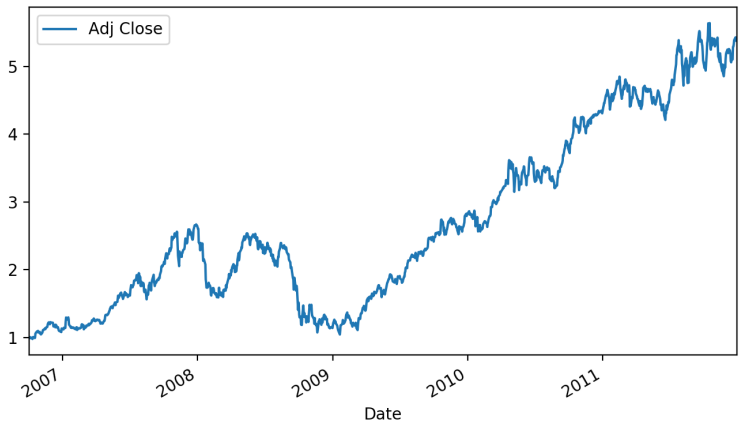
1 Follow the tutorial in the following link and run all the code in the tutorial on your own machine and submit the code and output as homework 1.
`https://www.datacamp.com/community/tutorials/finance-python-trading`

Time Series Data of Close Price

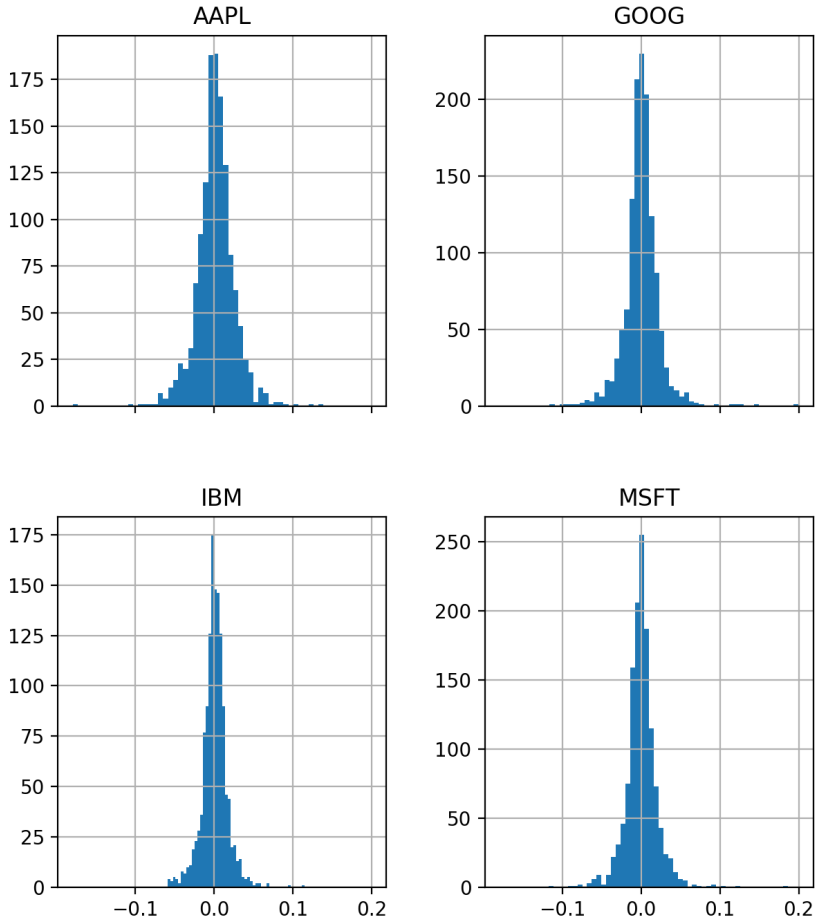
Histogram of Adjusted Close Price vs daily percent change



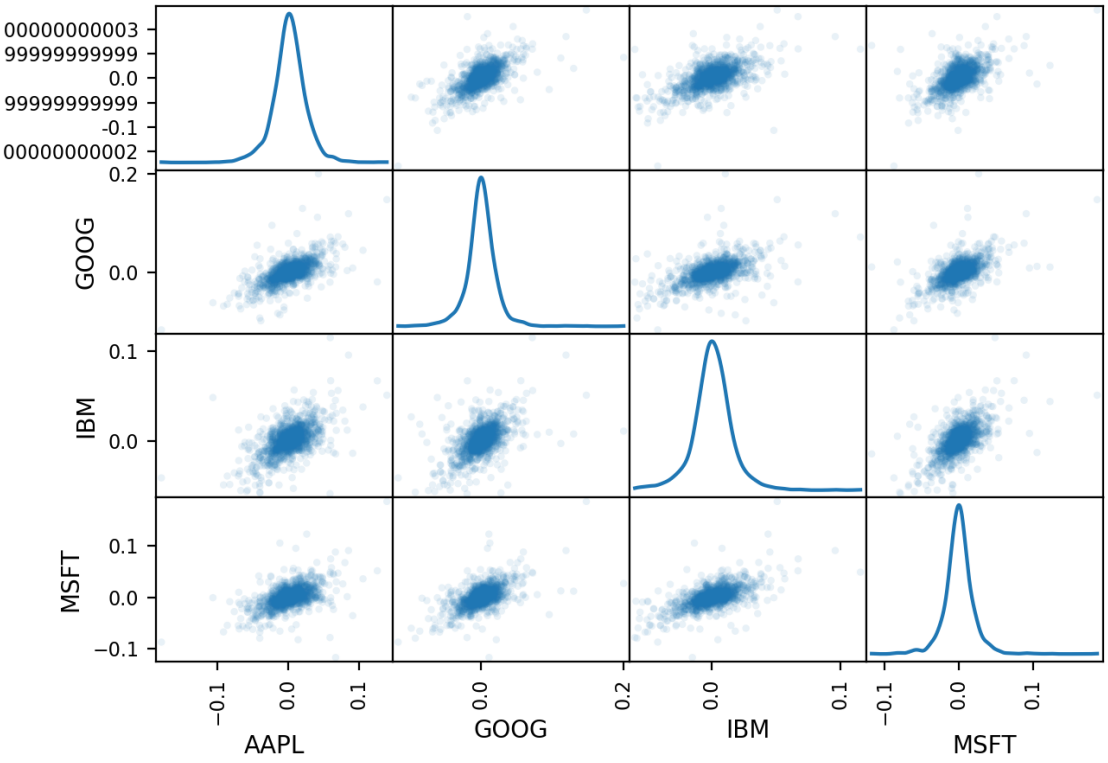
Cumulative daily rate of return



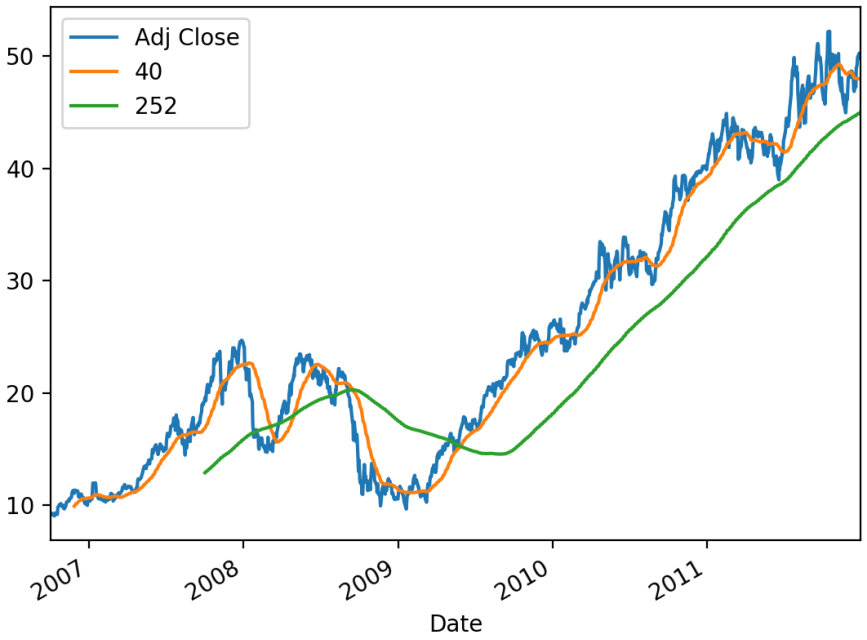
Histogram for multiple stocks



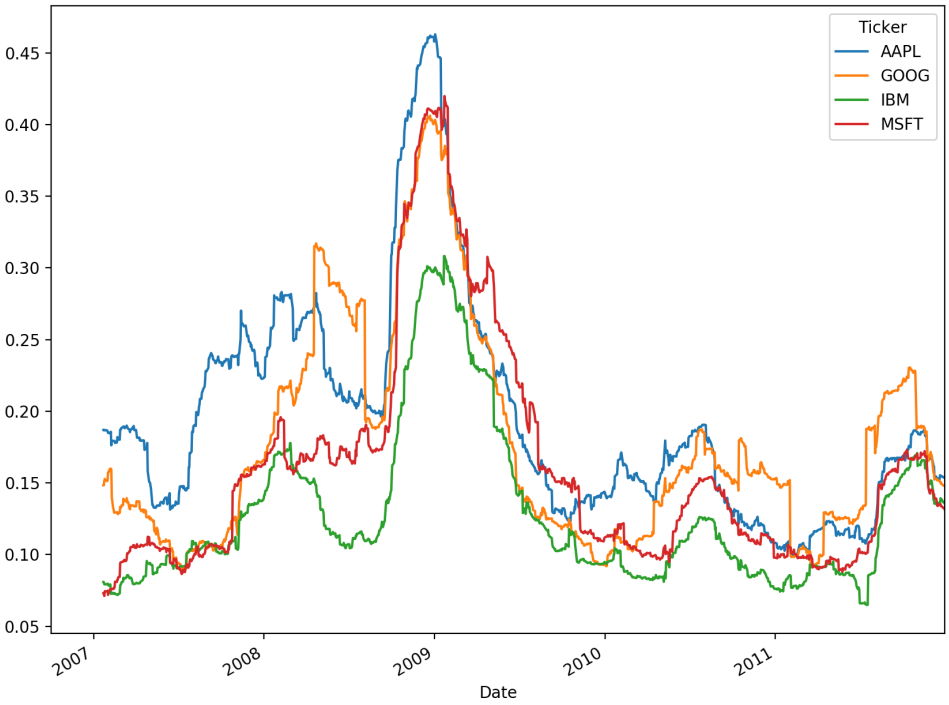
Scatter Matrix



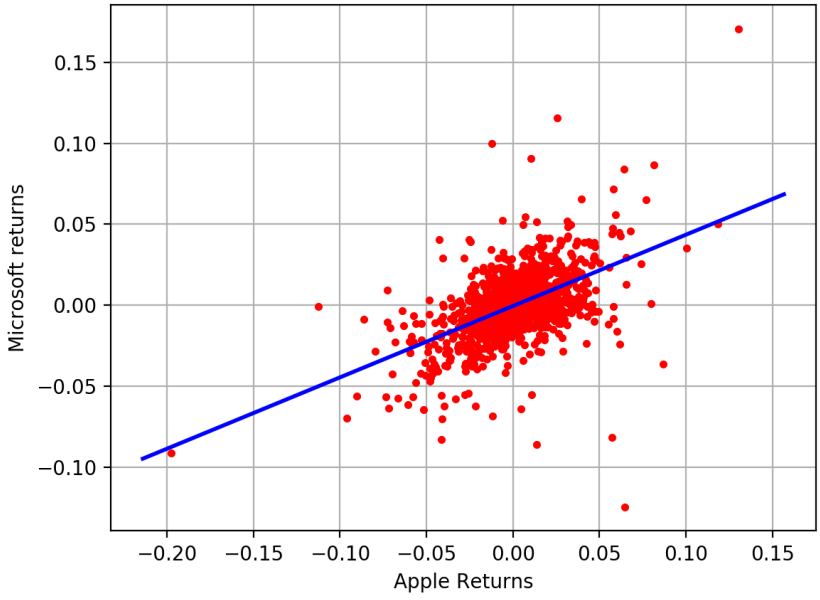
Daily vs short window vs long window



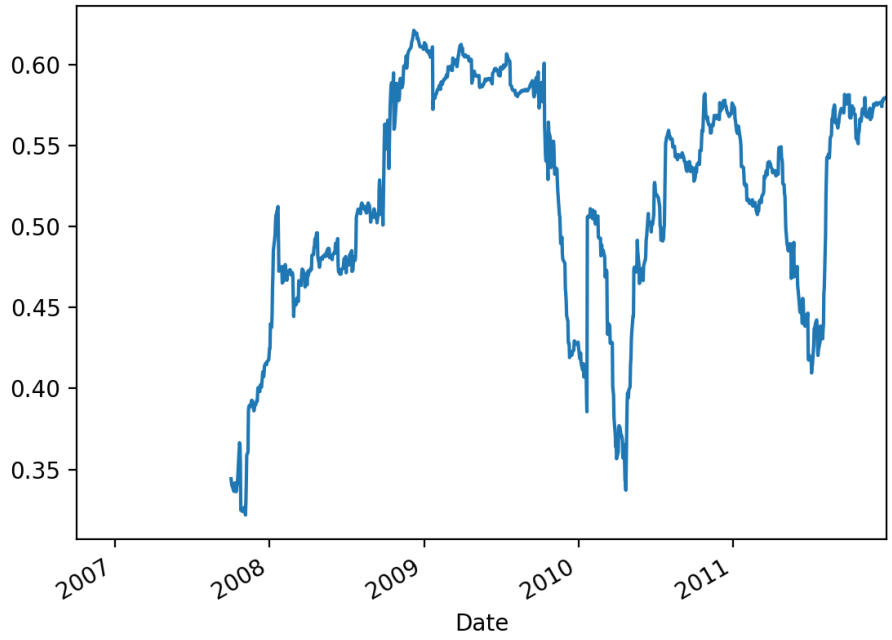
Volatility for multiple stocks



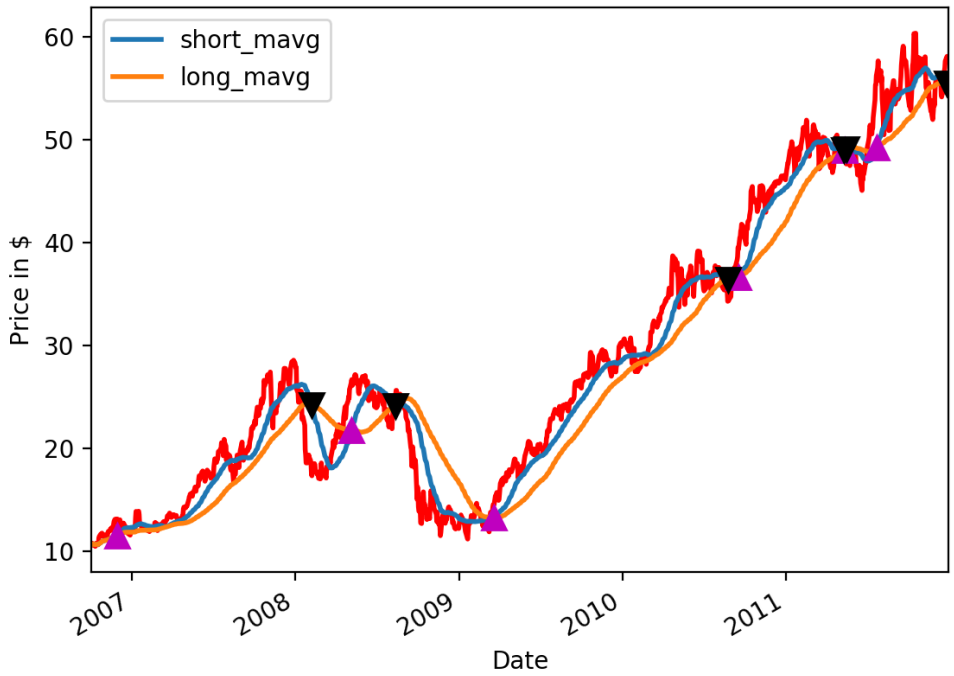
Ordinary Least-Squares Regression (OLS)



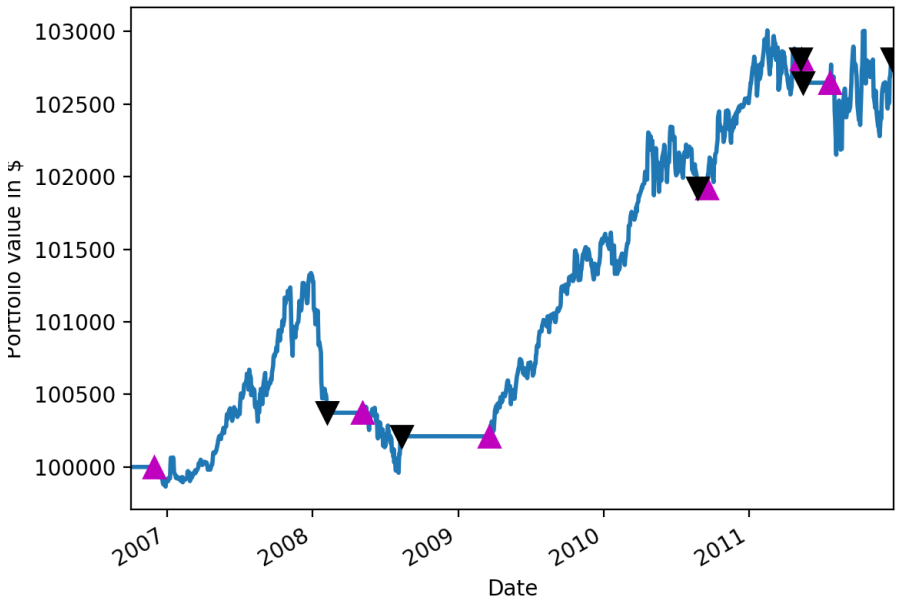
Rolling correlation of returns



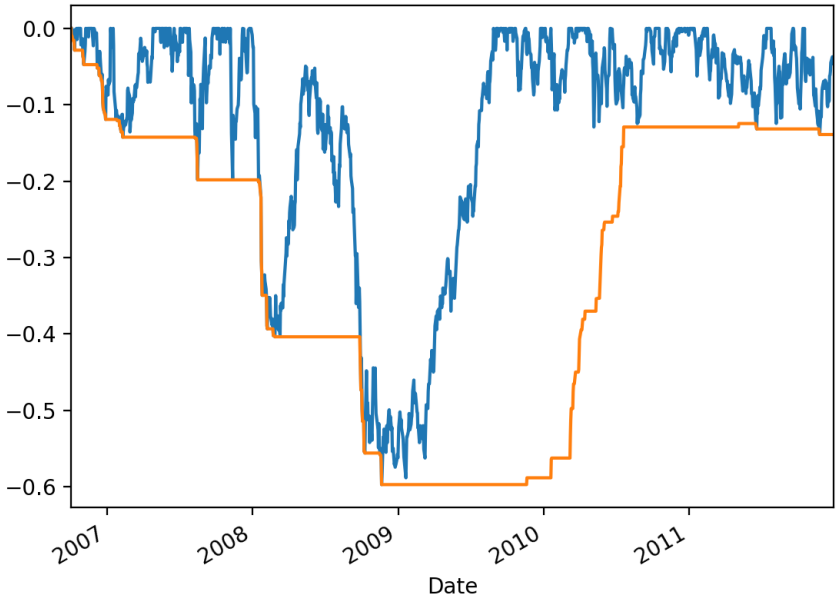
Short and long moving averages, and buy and sell signals



Portfolio Total



Maximum Drawdown



■

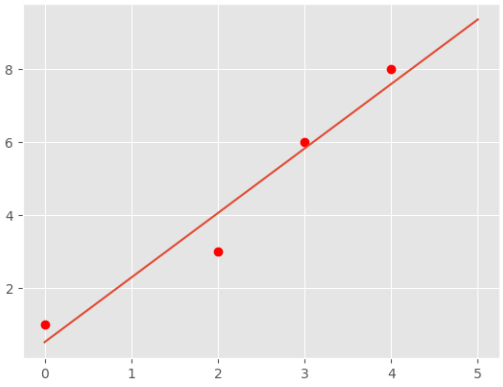
2 Perform a linear regression using Cramer's Rule on the following dataset by computing the slope and y-intercept of the line of best fit.

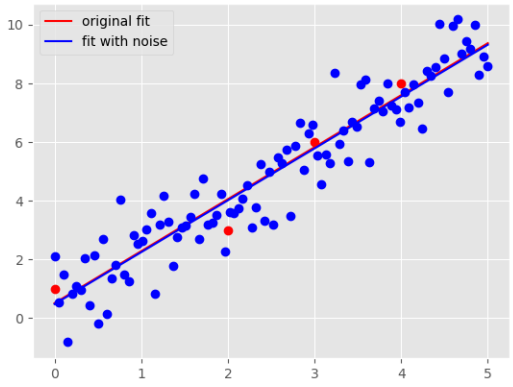
$$D = \{(0,1),(2,3),(3,6),(4,8)\}$$

Using Cramer's Rule,

$$\begin{aligned} m &= \frac{n\sum_{i=1}^{n}(x_i y_i) - \sum_{i=1}^{n} x_i \sum_{i=1}^{n} y_i}{n\sum_{i=1}^{n} x_i^2 - (\sum_{i=1}^{n} x_i)^2} \\ &= \frac{4\sum_{i=1}^{4}(x_i y_i) - \sum_{i=1}^{4} x_i \sum_{i=1}^{4} y_i}{4\sum_{i=1}^{4} x_i^2 - (\sum_{i=1}^{4} x_i)^2} \\ &= \frac{4*56 - 9*18}{4*29 - 81} \\ &= \frac{62}{35} \end{aligned}$$

$$\begin{aligned} b &= \frac{\sum_{i=1}^{n} x_i^2 \sum_{i=1}^{n} y_i - \sum_{i=1}^{n} x_i \sum_{i=1}^{n}(x_i y_i)}{n\sum_{i=1}^{n}(x_i^2) - (\sum_{i=1}^{n} x_i)^2} \\ &= \frac{\sum_{i=1}^{4} x_i^2 \sum_{i=1}^{4} y_i - \sum_{i=1}^{4} x_i \sum_{i=1}^{4}(x_i y_i)}{4\sum_{i=1}^{4}(x_i^2) - (\sum_{i=1}^{4} y_i)^2} \\ &= \frac{29*18 - 9*56}{4*29 - 81} \\ &= \frac{18}{35} \end{aligned}$$





■