



Quantitative Finance – ECO 41552-ONL (Spring 2024)
Tue 6 – 7:15pm / Thu 2 – 3:15pm (asynchronous), Jan 25 – May 22

Instructor: John Droescher | jdroescher@ccny.cuny.edu | Office Hours: Mon / Wed 5-6 pm

Portfolio Analysis Project Assignment

DUE Feb 28, 2024

Primary Objective: complete all the steps below and return the risk analysis of your seven (7) stock portfolio against the S&P500 (SPY), Russell 2000 (IWM), and the Dow Jones Industrial Average (DIA).

Requirements:

1. Create a table showing constituent (stocks) risk analysis in the equal-weight portfolio analysis as of the current date.
 - a. Column 1 – Ticker
 - b. Column 2 – Portfolio Weight (equally weighted)
 - c. Column 3 – Annualized Volatility (using trailing 3-months)
 - d. Column 4 – Beta against SPY (using trailing 12-months)
 - e. Column 5 – Beta against IWM (using trailing 12-months)
 - f. Column 6 – Beta against DIA (using trailing 12-months)
 - g. Column 7 – Average Weekly Drawdown (52-week Low minus 52-week High) / 52-week High
 - h. Column 8 – Maximum Weekly Drawdown (52-week Low minus 52-week High) / 52-week High
 - i. Column 9 – Total Return (using trailing 10-years)
 - j. Column 10 – Annualized Total Return (using trailing 10-years)
2. Create a table showing Portfolio Risk against the three ETFs:
 - a. Column 1 – ETF Ticker
 - b. Column 2 – Correlation against ETF
 - c. Column 3 – Covariance of Portfolio against ETF
 - d. Column 4 – Tracking Errors (using trailing 10-years)
 - e. Column 5 – Sharpe Ratio (using current risk-free rate)
 - f. Column 6 – Annualized Volatility (252 days) Spread (Portfolio Volatility – ETF Volatility)
3. Create a correlation matrix showing the correlations between the equal-weighted portfolio, 3 ETFs, and your 7 stocks.

Parting Thoughts: We will discuss many of the Pandas built-in functions you'll need to use to complete this project. However, you are still responsible for finding the formulas and merging those into your code using Python or Pandas. You are encouraged to use the internet to find code snippets, but make sure to annotate where you found the code (# comment). I highly recommend diving into how to accomplish these with the Pandas library.