Quantitative Finance

Python Programming Assignment 4 (call it MIDTERM)

- worth 4X of assignment
- due Wednesday 1:30PM on Wednesday October 16

Readings –

- Investment – Chapter 6 & 7
- Pair Trading – Chapter 1

Follow what I explained in class today.

There is no sample display of the actual answer. Your mission if you choose to accept – do everything after this sentence. You need to figure out if what you are doing is right or wrong at every stage of the assignment. I will not show you the answer. Your job is to tell me the risk analysis of the portfolio.

Building a portfolio analysis of the given pricing data for the technology ETFs (2) and the stocks (12).

The portfolio analysis consists of the following:

1. Create a table showing **constituents (stocks) risk analysis** in the equal-weight portfolio analysis as of 9/24/2 019
    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 QQQ (using trailing 12-months)
    e. Column 5 – Average Drawdown (52-week Low minus 52-week High) /52-week High
    f. Column 6 – Maximum Drawdown (52-week Low minus 52-week High)/52-week High
    g. Column 7 – Total Return (using data since 2010)
    h. Column 8 – Annualized Total Return (using data since 2010)
2. Create a table showing **Portfolio Risk against the two 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 data since 1/4/2010)
    e. Column 5 – Sharpe Ratio (assuming risk-free is 2%)
    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, 2 ETFs, and 12 technology stocks.
4. Graph the **efficient frontier** of your 12 assets against the QQQ.
5. Show a table of the new weighing of the **Optimized Portfolio**.
    a. Column 1 – Ticker
    b. Column 2 – New Optimized Portfolio Weighing

All of the codes for these financial statistics are searchable online. You need to #comment where you got the code.

This assignment if completed and correct will get a B for the final grade. That meant you can stop coming to class and not do the final project you will get a B for the grade.

COMPLETE! FIST-PUMP and SCREAM YOU DID IT!!