Ditiae Ex Machina

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Wealth from the machine

BCS FinTech

Motivation

Often times, when investing we choose investments that we are familiar with or that appeal to us for various reasons. Our choices may not be wise financially despite our feelings.

In order to keep all stocks in the portfolio, we must make sure that they meet some criteria:

1. Positive returns
2. Low risk, good returns-to-risk
3. Diverse
4. Low volatility
5. Positive forecasted growth

We developed a tool for analyzing a given portfolio to determine if it can provide positive returns while satisfying the investor's other sensibilities.

Understanding the problems

01 Data was collected from Alpaca API for a portfolio of stocks and the DJIA index.

02 The data collected was analyzed and cleaned. This included examining the data for any anomalies (i.e. stocks splits) that could corrupt the analysis. A new API, PolygonIO, was used to get stock split data.

03 The analysis was done mostly using pandas methods. The analysis looked at cumulative returns, standard deviations, correlation, Sharpe Ratios, Betas and Monte Carlo simulations.

04 Proper logging of the scripts was done through the 'logging' library. This provided useful information when the script failed. For instance, too many requests to the API caused a 429 error. This was easily seen in the logs and prevented unnecessary debugging.

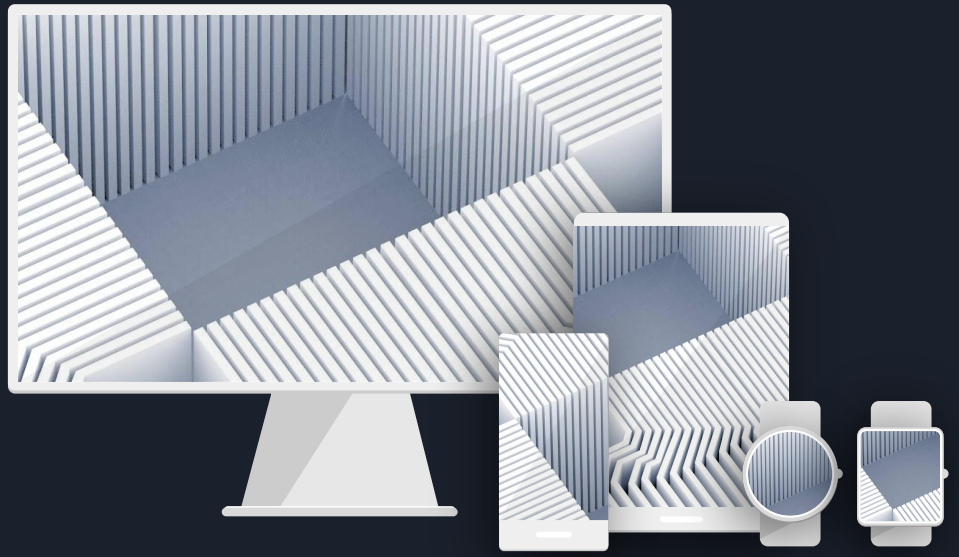
Challenges

01 Data had stock splits that corrupted the analysis. Fixed by importing stock split data from PolygonIO.

02 Data was not saved to SQL DB but should have been. Initially, it was but as the analysis was updated, the data changed. Ultimately, this has no impact on the analysis, but it's nice to have to keep the data. This is a must do if given more time.

03 Most analyses should have been done with pyFolio but this part was not completed by in time for merge to main. This would be done given more time.

04 More Monte Carlo simulations with different weightings would provide the absolute best weighting. This would require more compute resources and time.

Thank you!

Q & A