Portfolio Risk Analysis

Introduction

In this project, I worked on portfolio risk analysis based on the history of stock prices. From the NASDAQ100 list, 50 best stocks are chosen based on the previous month gains. And 5 stocks are chosen from the list for portfolio creation in every possible combination. Once portfolios are created, risk analysis is done and total risk for the portfolio is computed. Whichever the portfolio has the least risk, is selected for investment.

Acquisition of data

Nasdaq100 list is downloaded using an API from financialmodelingprep.com. All the tickers are stored, and price history of every ticker is downloaded from the Yahoo database. Price data is stored in csv format for future use.

Stock selection

Based on the previous month's gains, top 50 performing stocks are selected for further risk analysis. These numbers can be tuned according to the requirements. For example, if the market is volatile, gain calculation can be done for last two weeks and so on.

Portfolio creation

Once the top 50 stocks are selected, portfolio is created with 5 stocks from the list. All possible 5 combinations are made, and multiple portfolios are created.

Risk analysis

After portfolios are created, risk analysis is done on the portfolio using Sharpe ratio. Sharpe ratio can be used to calculate risk of a single stock and total risk is calculated by taking mean of individual risks.

Portfolio selection

Portfolio that has the least risk is selected for investment.