First Data Analysis Project Write-Up

Our questions we set out to answer were:

* Which sectors have experienced the most significant increase in stock prices over the past ten years?
* Which sectors have been the most stable in terms of stock price fluctuations over the past ten years?
* Which sectors would be best for investors, given the historical data and our analysis?

We chose to use historical data from the S&P 500 to make our conclusions, this [link](https://www.ssga.com/us/en/intermediary/etfs/funds/spdr-sp-500-etf-trust-spy#holdings) takes you to a page where you can download all current tickers in the S&P. We couldn’t find a reliable way to get the historical data showing which stocks were in the S&P for each year, so that’s our first drawback of this analysis, this analysis covers the 10-year data of the stocks currently listed in the S&P.

We also used the YahooFinance python library to get the open, close, high, and low for every symbol for each year starting at the beginning 01-01-2013 and ending 12-31-2022, so we’ve got access to price changes year over year and the maximum in year price difference.

We grouped the S&P500 stocks based on Sector and performed an analysis on the average year over year returns and in-year volatility of each sector.

We found that the Information Technology, Healthcare, and Energy sectors award the highest average year over year returns, based on the results of our ANOVA test. When comparing the average return of these sectors multiplied by their weight in the S&P 500, we found that we can confidently conclude that these three sectors have a higher average return. Our mean was 3.32 and our p-value was 9.3x10^4.

We did not run an ANOVA test on the average variance, but we did run a linear regression analysis and concluded that there’s a correlation coefficient of 0.88 between the Average Annual Return and the Average In-Year Volatility. Which helped us come to our conclusion that if you want higher returns you should invest in IT, Healthcare, and Energy stocks but you should be ready to deal with high volatility and the possibility that you’ll lose large amounts of value within your portfolio. If you want to play it safe you may have to sacrifice returns; as lower-volatility stocks, which are safer, tend to be less lucrative for investors.