Quant Finance Bootcamp Executive Summary

This GitHub repository contains a series of four mini-projects exploring key concepts in quantitative finance. Each Jupyter Notebook in this repo explores a different topic in quant finance, including:

1) Portfolio Construction – Designed both high-risk and low-risk portfolios using historical stock data from yfinance.

2) Statistical Assumptions – Tested core assumptions of financial mathematics, including whether stock log-returns follow a normal distribution.

3) Option Pricing Visualization – Created visualizations to illustrate how option prices evolve with changes in spot price and time to maturity.

4) Hedging Under Dynamic Volatility – Investigated how time-varying volatility affects the performance of delta hedging strategies.

I enjoyed the portfolio construction mini project the most. It was engaging to apply quantitative methods to build two contrasting portfolios of my own design—one low-risk and one high-risk. Connecting the results to broader investment strategies made the project even more rewarding.

The low-risk portfolio focused on capital preservation with moderate growth. The goal was to achieve stable, modest returns while minimizing volatility. In contrast, the high-risk portfolio was geared toward aggressive growth. Here, significant short-term fluctuations are acceptable, as they may lead to substantial long-term gains—making this strategy appropriate for investors with a higher risk tolerance.

Overall, I enjoyed leveraging my technical background in programming, mathematics, and optimization to work with real-world financial data using yfinance. I found it rewarding to apply these skills in a practical context, and I plan to continue using yfinance (or similar tools) for personal projects and investment analysis in the future.