## Seth - Introduction

Hi, we are the Stock Quant team.

Stock Quant is a quantitative stock analysis app designed for individual investors to make informed investment decisions about stocks listed on the New York Stock Exchange (NYSE). It provides an easy-to-use interface for fetching time series data and performing various analyses on stock prices.

## Seth - App overview

Let’s take a look at the architecture:

1. The User interacts with the Streamlit Front-end UI and selects the Ticker and Date range using Streamlit’s built-in widgets.
2. The Front-end communicates with the Python Back-end.
3. Python Back-end fetches stock data from the Yahoo Finance API.
4. The Yahoo Finance API is used as the primary data source, with data fetched directly and stored in a Pandas dataframe and processed on-the-fly.
5. The dataframe is loaded into the Prophet machine learning algorithm, which generates predictions which are then displayed in the Front-End UI for the user to examine.

## Costas - Landing page

The purpose of the landing page for the Stock Quant app is to provide a clear and concise introduction to the app, its features, and its intended audience. It serves as an entry point for users, offering them an overview of the app's functionality and purpose before they begin using it.

The app consists of two main functionalities:

1. **Compare Stocks**: This feature allows users to select up to 5 stocks and compare their price trends within a chosen date range. This can help users identify trends, correlations, and patterns among the selected stocks, providing valuable insights for investment decisions.
2. **Stock Price Forecast**: This feature enables users to predict a stock's future price based on historical data. This can help users gauge the potential future performance of a stock and make informed decisions about whether to buy, hold, or sell the stock.

## Costas - Stock comparison page

Moving to the stock comparison page - The stock comparison page lets users compare stock prices over a specified period. It uses the Yahoo Finance API to fetch stock prices, and Plotly to create interactive line charts. Users can input up to five stock symbols and choose a date range for the comparison.

When the "Analyze" button is clicked, the app fetches stock prices for the given symbols and date range. If any stock symbols are not found, an error message is displayed. The app then creates a line chart comparing the adjusted daily closing prices of the selected stocks, and a table with the price data is displayed in an expandable section below the chart. The app takes advantage of Streamlit caching to avoid repeating API calls to fetch stock prices if that data has already been downloaded in that session.

## Shubham - Forecast page

On the forecast screen, the first option that the user sees are the input fields asking for the stock code, the training start and end dates and the forecast start and end dates. Those are the only inputs. When the user clicks the Predict button – the daily stock price data is fetched. Based on the part-2 of this project we saw the best prediction model that was working for us is the Facebook Prophet model. So that’s what we have implemented here to obtain the forecasts for the selected date range.

Facebook Prophet is an open-source forecasting tool that employs additive regression models for accurate time series predictions. By decomposing data into trend, seasonality, and holiday components, Prophet adapts to various patterns and data types. We have customized it to account for the gaps in the daily data by following the US Federal holiday calendar.

As of now, this part of the app is not yet deployed and what we see on screen right now is a dummy screenshot. But the final app will also show a graph with the same details i.e. Train values, Test values (if the user selected a forecast date range that is in the past), Forecasted values and the Confidence interval band.

## Shubham - Conclusions

In conclusion, Stock Quant combines the power of Python libraries like Pandas, Plotly, and Streamlit to create an intuitive and interactive web app that simplifies stock analysis for individual investors.