**Project Proposal**

**Project Title:** Historical Analysis of Stocks to Evaluate Growth, Fluctuation, Risk, and Potential Future Performance.

**Team Members:**

* Angelo Horvath
* Cesar Zea
* Levan Getia
* Xingjia Wang

**Project Description/Outline:** The project aims to conduct a comprehensive historical analysis of various stocks listed on the Nasdaq index to assess their growth, price fluctuation, risk, and potential future performance. The goal is to provide valuable insights to young investors looking for information to make informed investment decisions in the growing trend of DIY investments. By evaluating different stocks at different risk levels, the project will recommend the best options for investment, taking into consideration investors' risk aversion.

**Research Questions to Answer:**

1. Which stocks have demonstrated the largest growth over time?
2. Which stocks show the highest probability of growth for the year 2024?
3. Which stocks present the least risk for investors based on price fluctuations?

**Datasets to be Used:** The data for the analysis will be collected from the Nasdaq index, including historical stock price data for various companies listed on the exchange.

<https://www.kaggle.com/datasets/svaningelgem/nasdaq-daily-stock-prices>

**Rough Breakdown of Tasks:**

1. GitHub Preparation and Setup (Levan Getia):
   * Create a new repository on GitHub.
   * Name the repository and create the main branch for the final project.
   * Share the repository link with team members.
2. Project Proposal (Cesar Zea, Levan Getia, Xingjia Wang):
   * Project title. List team members' names and roles. Provide a project description and outline. Define research questions to be addressed. Identify datasets to be used. Rough breakdown of tasks.
3. Data Collection and Cleaning (Cesar Zea, Levan Getia):
   * Gather data from the Nasdaq index for 25 different stocks.
   * Merge the individual stock data into one comprehensive dataset.
   * Eliminate irrelevant columns such as 'Dividends,' 'Stock Splits,' 'Adj Close,' and 'Capital Gains.'
4. Growth and Stability Analysis (Angelo Horvath, Cesar Zea, Levan Getia, Xingjia Wang):
   * Calculate the price growth over time for each stock and rank them based on their performance.
   * Identify the top 5 stocks recommended for growth.
   * Evaluate the price changes of the stocks from 2015 to May 2023.
   * Include only the stocks that show a price change of up to 200% (+/-) for reliability.
5. Risk Evaluation (Angelo Horvath, Cesar Zea, Levan Getia, Xingjia Wang):
   * Rank the stocks based on variance to assess risk.
   * Identify the top 5 stocks recommended for stability (low risk).
6. Combining Growth and Risk Analysis (Angelo Horvath, Cesar Zea, Levan Getia, Xingjia Wang):
   * Rank the stocks based on R-Squared scores to evaluate the combination of growth and stability.
   * Identify the top 5 stocks recommended for growth and low risk.
7. Live Price Retrieval (Levan Getia) :
   * Use the Finnhub API to retrieve live prices for the stocks identified in the previous steps.
8. Predicted vs Actual Price Comparison (Levan Getia) :
   * Rerun predictions for the top 5 stocks using linear regression and calculate potential prices for one year in the future.
   * Compare the predicted prices with the actual live prices for the top 5 stocks.
9. Presentation and Recommendations (Angelo Horvath, Cesar Zea, Levan Getia, Xingjia Wang):
   * Create scatter plots for the top 20 stocks, showing the linear correlation equation and projecting the price for 2024.
   * Prepare a summary data frame with the top 20 stocks, including Standard Deviation and R-Squared scores.
   * Provide recommendations for the best 5 stocks for growth, low risk, and growth with low risk.

**Conclusion:** This project aims to provide valuable insights and recommendations to young investors seeking potential stocks for investment. By conducting a historical analysis and evaluating growth, stability, and risk, the team will offer well-informed suggestions for making investment decisions based on individual risk preferences and growth expectations.