**Project Title:** Stock Performance Analysis of S&P 500 Companies using Pandas & NumPy

**Project Goal:** The goal of this project is to analyze the historical stock performance of selected S&P 500 companies using only Pandas and NumPy. I aim to identify key trends, risks, and opportunities in the stock market by applying essential data analysis techniques.

**Vision:**

To build a strong foundation in financial data analysis using Python and become a confident data analyst who can draw real-world business insights from raw data.

**Mission:**

 To clean and process stock data of top-performing S&P 500 companies using Pandas and NumPy.

 To explore trends such as stock returns, volatility, and moving averages.

 To use only core data analysis skills (without advanced libraries) and still produce meaningful, professional-level results.

 To prepare a project that is clean, well-documented, and insightful enough to impress my teacher and earn a job opportunity.

**Step 1: Load and Explore the Data**

* Read CSV using pandas
* Check columns: Date, Open, High, Low, Close, Volume, Name

**Step 2: Clean the Data**

* Handle missing values
* Convert Date column to datetime
* Sort by date
* Filter out 3–5 top companies (Apple, Google, etc.)

**Step 3: Analyze Stock Trends**

* Calculate daily returns: Return = (Close - Open)/Open
* Calculate moving averages (7-day, 30-day)
* Compare performance between companies

**Step 4: Use Numpy for:**

* Statistical measures (mean, std, max, min returns)
* Correlation matrix between companies
* Detect days with highest volatility

**Step 5: Visualize (Optional Bonus)**

* (Even though only pandas and numpy are required, we can generate .csv insights or basic matplotlib visuals if allowed.)

**Step 6: Conclusion & Insights**

* Best performing stock
* Risk vs return
* Recommendation based on past performance