# Finance & Risk Analytics

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# Agenda

- Objective
- Insights & Visualization
    - Stocks Data Overview
    - Stocks Visualization
- Sector-Wise Analysis
- Key Findings in Stocks
- Portfolio Analysis
- Methodology

# Objective

We're examining a stock portfolio to provide investment guidance based on the needs of two clients:

**Mr. Patrick Jyenger:**

- Mr. Patrick Jyenger is looking to invest $500K in stocks.
- He follows a conservative investment approach, prioritizing low risk.
- His goal is to double his capital within a 5-year timeframe.

**Mr. Peter Jyenger:**

- Mr. Peter Jyenger plans to invest $1 million in equities.
- He's a high-risk investor, seeking the potential for higher returns.
- His objective is to double his capital within a 5-year period.

Insights & Visualization

# Stocks Data Overview

➔ We have a total of 24 stocks categorized into four sectors, with each sector comprising 6 stocks.

➔ We also have the S&P500 index, which represents the top 500 stocks in the US stock market.

➔ Here's a list of the stocks, including their abbreviations, industries, and company names.

| Ticker | Industry | Company Name |
|--------|----------|--------------|
| AAL | Aviation | American Airlines Group Inc |
| ALGT | Aviation | Allegiant Travel Company |
| ALK | Aviation | Alaska Air Group Inc |
| DAL | Aviation | Delta Air Lines Inc |
| HA | Aviation | Hawaiian Holdings Inc |
| LUV | Aviation | Southwest Airlines Co |
| BCS | Finance | Barclays |
| CS | Finance | Credit Suisse |
| DB | Finance | Deutsche Bank |
| GS | Finance | Goldman Sachs |
| MS | Finance | Morgan Stanley |
| WFC | Finance | Wells Fargo |
| JNJ | Healthcare | Johnson & Johnson |
| MRK | Healthcare | Merck and CO inc. |
| PFE | Healthcare | Pfizer inc |
| UNH | Healthcare | UnitedHealthGroup Inc |
| BHC | Pharmaceuticals | Bausch Health Companies inc |
| RHHBY | Pharmaceuticals | Roche Holding AG |
| AAPL | Technology | Apple Inc |
| AMZN | Technology | Amazon |
| FB | Technology | Facebook |
| GOOG | Technology | Alphabet |
| IBM | Technology | IBM |
| MSFT | Technology | Microsoft |

# Stocks Visualization

**Actual Stocks Data**

Visualizing Actual Stock Values
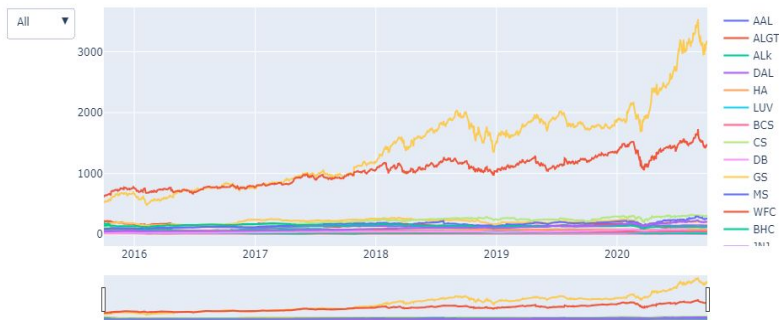


**Normalized Stocks Data**

Visualizing Normalized Stock Values



**Stock Performance Over 5 Years:**
- The chart above shows the 5-year performance of all stocks.
- It's clear that Amazon and Microsoft have outperformed other stocks during this period.

**Stocks vs. S&P500 Index:**
- This chart compares stock performance with the S&P500 index.
- Remarkably, 8–9 stocks outperformed, achieving returns exceeding 80% in the 5-year period.

# Sector – Wise Analysis

# Aviation Sector

- The aviation sector took a severe hit in March 2020 due to the COVID-19 pandemic, and it hasn't fully bounced back since.
- Despite a rising market index, this sector continues to face challenges.



Visualizing Normalized Stock Values

# Finance Sector

- Due to Corona Pandemic hit in March 2020 Finance sector has also faced a `major crisis` and the sector has recovered a bit, although majority of stocks has been hit.
- **Morgan Stanley & Goldman Sachs** have performed well when compared to other stocks.

Visualizing Normalized Stock Values

# Technology Sector

- Due to Covid Pandemic hit in March 2020 Technology Sector has also faced crisis but the recovery rate shown by this sector is commendable.
- Key players like Microsoft, Amazon, Apple, Facebook, and Google have not only rebounded but also performed well, aligning with the market index.
- On the flip side, IBM has consistently underperformed compared to other stocks in the same sector over the years

Visualizing Normalized Stock Values

# Healthcare & Pharma Sector

- The COVID-19 pandemic had a significant impact on the pharmaceutical and healthcare sector in March 2020. However, this sector has showcased an impressive recovery.
- 🟢**United Health, Johnson & Johnson** have performed well when compared to S&P Index.
- 🔴**Bausch Health** has consistently underperformed compared to other stocks in the same sector over the years



Visualizing Normalized Stock Values

Key Findings in Stocks

# Top 8 Stocks with Returns more Than 80% in 5 Years

**Annual Returns of Selected Stocks:**

- AMZN: 40.59%
- MSFT: 34.95%
- AAPL: 33.32%
- FB: 26.45%
- UNH: 23.72%
- GOOG: 21.02%
- MS: 14.55%
- S&P500: 13.04%

| Stock | Avg Daily Returns | Risk | Min | Max | Annualized_Returns | Annualized_Risk | Sharpe_Ratio | Cumulative Returns |
|---|---|---|---|---|---|---|---|---|
| AMZN | 0.16 | 1.9 | -7.92 | 13.22 | 40.59 | 30.11 | 1.32 | 504.69 |
| MSFT | 0.14 | 1.75 | -14.74 | 14.22 | 34.95 | 27.84 | 1.23 | 371.49 |
| AAPL | 0.13 | 1.87 | -12.86 | 11.98 | 33.32 | 29.73 | 1.1 | 322.74 |
| FB | 0.1 | 2.04 | -18.96 | 15.52 | 26.45 | 32.31 | 0.8 | 187.96 |
| UNH | 0.09 | 1.78 | -17.28 | 12.8 | 23.72 | 28.27 | 0.81 | 167.36 |
| GOOG | 0.08 | 1.65 | -11.1 | 10.45 | 21.02 | 26.23 | 0.77 | 140.41 |
| MS | 0.06 | 2.18 | -15.6 | 19.77 | 14.55 | 34.62 | 0.4 | 53.49 |
| S&P500 | 0.05 | 1.21 | -11.98 | 9.38 | 13.04 | 19.18 | 0.64 | 74.81 |
| MRK | 0.05 | 1.41 | -8.9 | 10.41 | 12.88 | 22.33 | 0.54 | 68.02 |
| JNJ | 0.05 | 1.25 | -10.04 | 8 | 11.35 | 19.78 | 0.54 | 59.79 |
| GS | 0.03 | 1.99 | -12.71 | 17.58 | 7.64 | 31.59 | 0.22 | 14.17 |
| RHHBY | 0.03 | 1.35 | -8.96 | 13.01 | 7.38 | 21.45 | 0.31 | 28.87 |
| LUV | 0.02 | 2.29 | -15.11 | 14.44 | 6.16 | 36.37 | 0.15 | -2.37 |
| PFE | 0.02 | 1.38 | -7.73 | 8.96 | 5.25 | 21.95 | 0.21 | 15.26 |
| DAL | 0 | 2.65 | -25.99 | 21.02 | 1.05 | 42.03 | 0.01 | -32.66 |
| HA | 0 | 3.31 | -26.5 | 24.58 | 0.86 | 52.6 | 0 | -47.88 |
| IBM | 0 | 1.61 | -12.85 | 11.3 | -0.04 | 25.54 | -0.03 | -15.27 |
| ALGT | 0 | 2.91 | -28.33 | 29.24 | -1.19 | 46.2 | -0.04 | -45.04 |
| ALk | -0.03 | 2.69 | -23.24 | 20.31 | -6.44 | 42.71 | -0.17 | -54.34 |
| AAL | -0.03 | 3.47 | -25.22 | 41.1 | -8.47 | 55.12 | -0.17 | -68.65 |
| WFC | -0.04 | 2.03 | -15.87 | 14.53 | -10.44 | 32.3 | -0.35 | -54.3 |
| CS | -0.04 | 2.28 | -18.26 | 16.34 | -11.01 | 36.26 | -0.32 | -58.61 |
| DB | -0.05 | 2.77 | -17.49 | 14.02 | -13.33 | 44.04 | -0.32 | -68.33 |
| BCS | -0.05 | 2.51 | -21.85 | 15.1 | -13.82 | 39.87 | -0.37 | -66.62 |
| BHC | -0.09 | 4.46 | -51.46 | 33.74 | -22.6 | 70.72 | -0.33 | -91.35 |

# Annualized Risk & Annualized Return

- The top five stocks by annualized return are *AMZN, MSFT, AAPL, FB, and UNH.*
- The annualized return on each of the top 5 stocks is greater than 20. Compared to other equities, the risk of these five stocks is moderate.
- Lower returns increase the likelihood of losing the initial investment.
- *BHC, BCS, DB, CS, and WFC* have higher risk as they didn't provide returns on the initial investment.
- Lower **ROI** indicates higher risk in stocks. However, some stocks may not offer high returns but provide a risk-free investment opportunity.
- *JNJ, RHHBY, MRK* are stocks with less risk and good returns.



Annualized Risk & Annualized Return
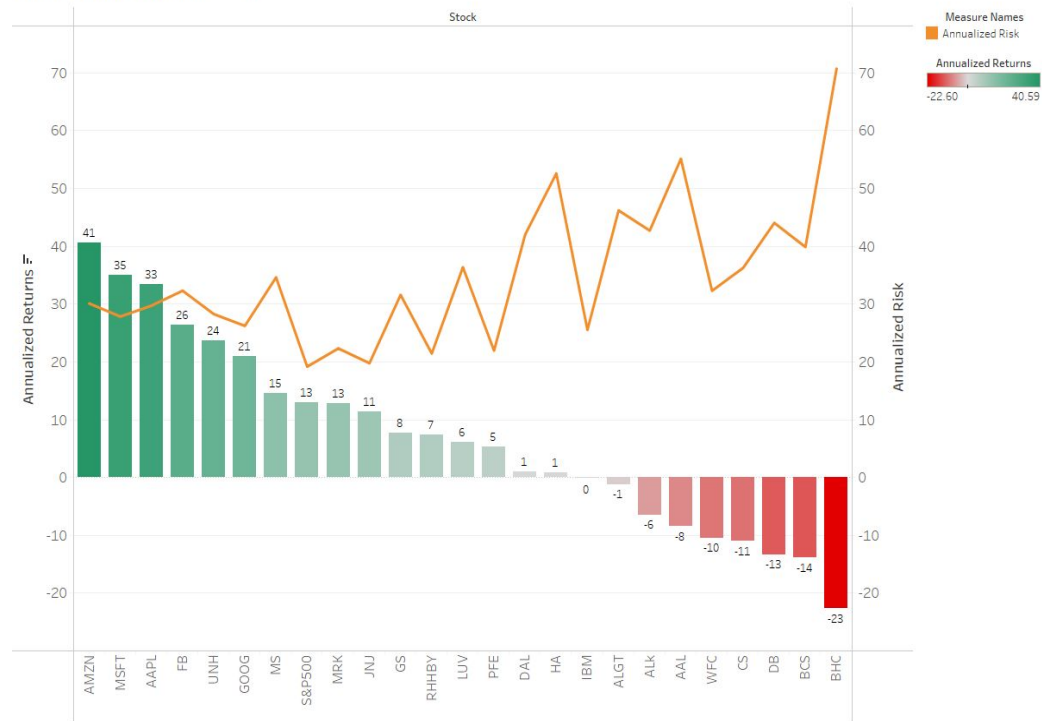
# Portfolio Analysis

# Portfolio analysis

➜  Patrick Jyengar Portfolio

- **Investment Goal**: Double the investment in 5 years with decent returns and low risk.
- **Preferred Stocks**: *JNJ, RHHBY, MRK* are suitable due to their low risk.
- However, these three stocks wouldn't alone reach the desired returns.
- A portion of the investment can be allocated to *MSFT* to achieve the target returns.
- **Equal weightage** of **0.25** is allocated to all stocks.
- Investment: **($500 K)** in equities.
- **Expected Returns**: **($1.05 Million)** after 5 years.
- **Gain on Investment**: **($558 K).**



Portfolio Daily Returns
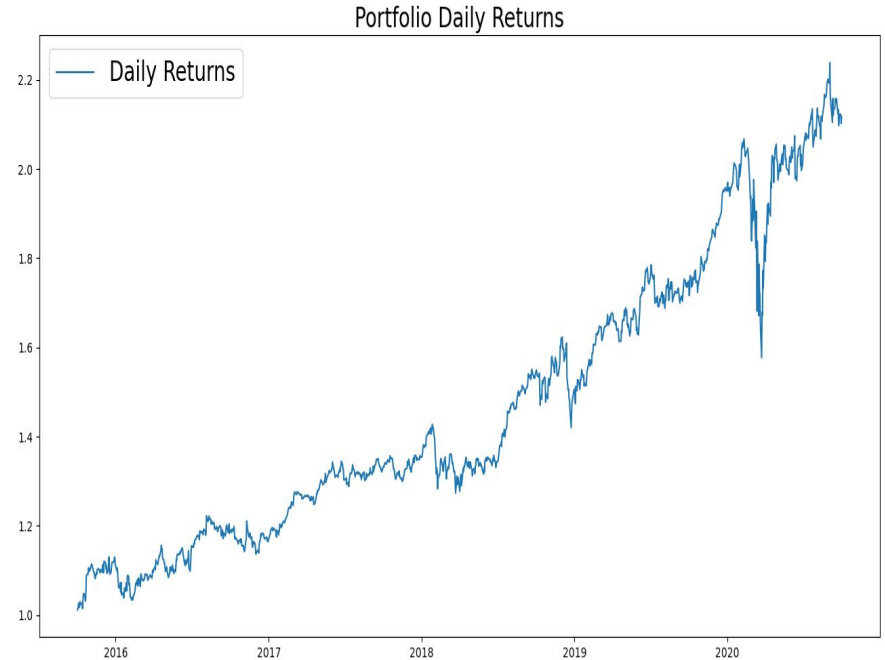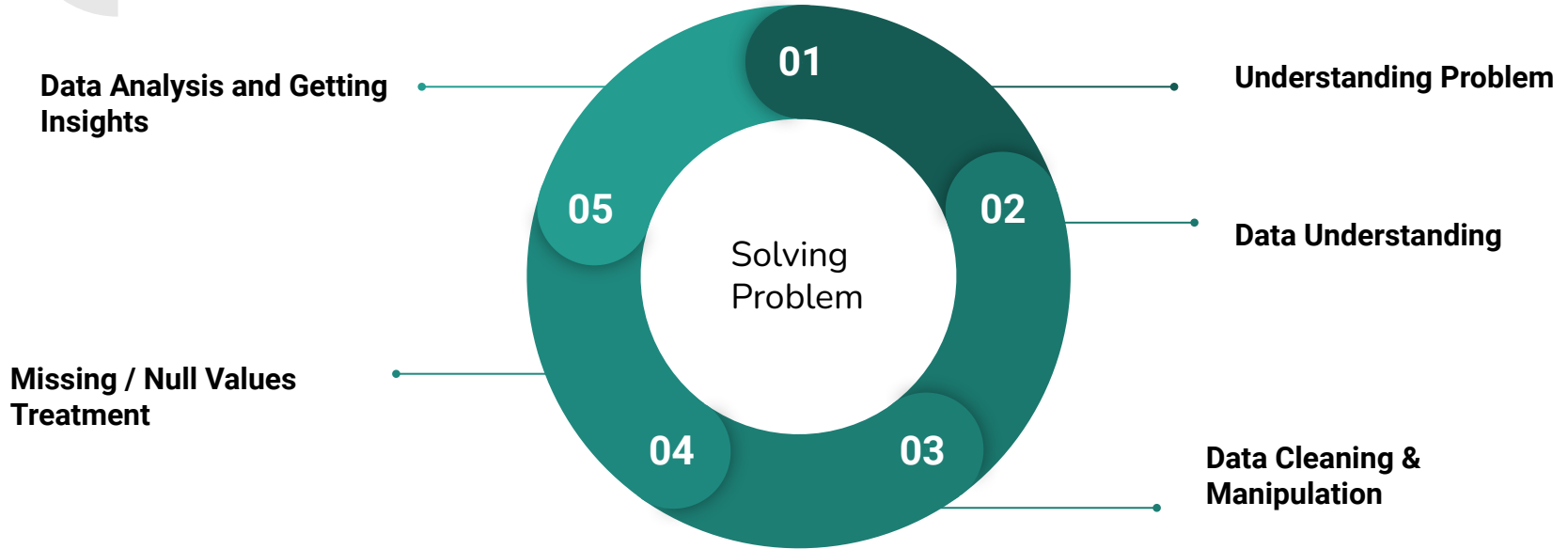
# Portfolio analysis

➜ <u>Peter Jyengar Portfolio</u>

- **Investment Goal**: High-return investments for inorganic expansion of the company, accepting high risk.
- **Preferred Stock** : *AMZN, AAPL* suitable due to its high-risk/high-reward nature.
- Believes in bouncing back from occasional losses.
- **Investment**: (**$1 Million**) from company's cash and cash equivalents.
- **Expected Returns**: More than (**$6 Million)** after 5 years.
- **Gain on Investment**: More than **$5 Million**.
- Focus on maximum returns and managing associated risk.

Portfolio Daily Returns
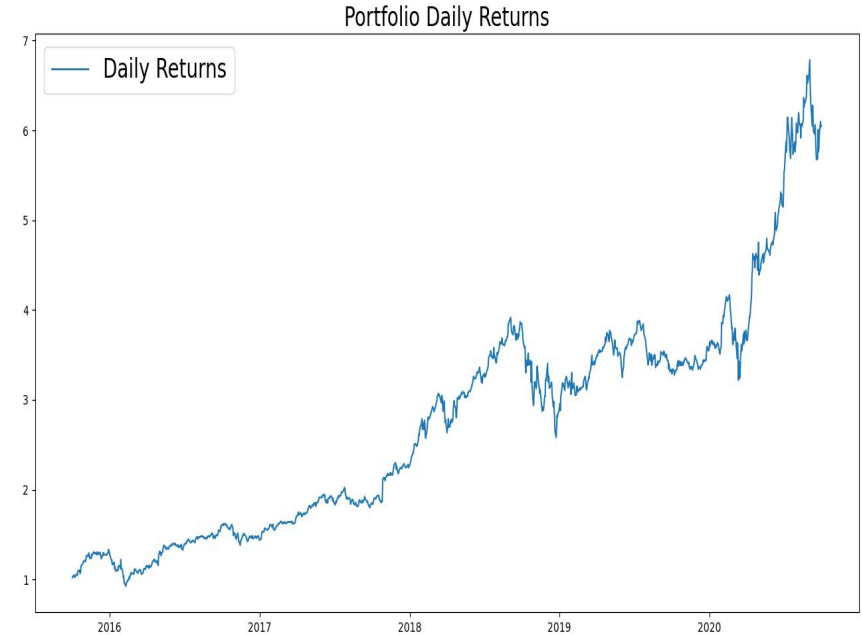
— Daily Returns

# Methodology

# Methodology

**01**   **Exploratory Data Analysis:**
- Checked for null values (none found).
- No null values in Rows & Columns.
- Examined the dataset for outliers.

**02**   **Data Analysis Highlights:**
- Calculated daily returns, cumulative returns, Sharpe ratio, portfolio risk, and ROI.
- Identified the top-performing stocks.
- Discovered 8 to 9 stocks with over 80% returns in the last five years.

**03**   **Top-Performing Stocks:**
- AAPL, AMZN, FB, GOOG, MSFT, UNH, RHHBY, MS
- Performed sector-wise analysis to get a better view of each sector.

**04**   **Risk and Returns:**
- Each stock carries different levels of risk and liability.
- AMZN offers high returns but comes with high risk.
- Stocks like JNJ, RHHBY, MRK, and MSFT offer good returns with lower risk.

**05**   **Conclusion:**
- Finalized portfolios for both customers based on analysis.

Thank You