**Project Scope: GLOBAL STOCK MARKET ANALYTICS**

**Objectives:**

1. Comparative Study of Global Markets – Returns, Volatility, Correlations.
2. Predicting **Nifty 50 open direction** based on global indicators.(you can decide the target market-I have considered India for which Nifty50 is the benchmark index)
3. Sentiment Analysis of Nifty 50 using X(twitter) data

**Phase 1 is all about creating master data:**

1. List down global market indices:
   1. Nifty 50
   2. Dow Jones Index
   3. Nasdaq
   4. Hang Seng
   5. Nikkei 225
   6. Dax
2. Check symbols for each of the index above which will help you to fetch data
3. Check R/Python syntax to download data for each index for Six years.(from 1st Jan 2018 till 31st December 2023-**OHLC Data**)
4. Add USA VIX data for Six years (Volatility Index- Fear Factor)
5. Calculate daily returns based on close prices of each index: ( Yt-Yt-1)/(Yt-1) \* 100
6. Check if daily returns follow Normal distribution
7. Rename variables in each file (Example: Nifty50\_Open,Nifty50\_Adjclose)
8. Merge all the above files with outer join (note that holidays are different globally)
9. Impute missing data using LOCF method
10. Create indicator variable for “Quarter”
11. Create indicator variable for “Month”
12. Create indicator variable for “Year”
13. Finalize Master Data which will be used for Phase 2

**Phase 2 is Exploratory Data Analysis**

**Questions:**

1. **Which index has given consistently good returns?**
2. **Which index was highly volatile?**
3. **How are global markets correlated during 6 years period and is the correlation structure similar in the recent year-2023?**
4. **Assuming primary target variable as “Nifty Opening Price Direction”, what are preliminary insights?**
5. Global Indices 5 years Performance Analytics:(

For each index (a to f above)

1. Box-Whisker Plot of daily returns by “YEAR”
2. Table of daily returns by “YEAR”- (n, mean and std. deviation)
3. Bar Plot of median daily return by “YEAR”
4. Heat Map by “YEAR” and “QUARTER” showing median/mean returns
5. Global Indices-Correlation Analysis
6. Correlation Matrix of 5 years daily returns (6 by 6 matrix)
7. Correlation Matrix of one year (2023) daily returns (6 by 6 matrix)
8. Pre-Post Covid Performance Analytics
9. Nifty 50 Daily Movement- Pre Modeling
10. Define Nifty\_Open\_Dir=1 if Nifty 50 Open at t > Close at t-1

=0 other wise

1. Table of % of Nifty\_Open\_Dir=1 by year
2. Visualize/summarize global indices including VIX for 2 categories of Nifty\_Open\_Dir

Example: Box -whisker plot of lag ( DJI Returns) for 2 categories of Nifty\_Open\_Dir

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