**Project Overview**

**Purpose (Business Problem):**

**Problem Statement**: You have to analyze 2 decades (2000-2021) of the Nifty 50 index in the Indian Stock Market and come up with strategies to invest for higher returns in the future.

**Objective**: Your objective is to analyze the data and come up with strategies to build a portfolio that will bring the maximum yield.

**Tasks to be performed**: 1. Analyze the indicators in the dataset that best explain the volatility and unpredictable nature of the stocks in the last decade.

2. Choose promising stock based on your analysis for your portfolio

3. Build a dashboard where you can analyze the performance of the stocks

4. Feature engineer and build machine learning solutions for the business Requirements.

**Methodology:** For simplicity I took only a specific entity dataset which is Adaniport.

**Data collection**: I collected the stocks data from NSE website through Kaggle.

1. **Data Preprocessing**: The dataset is cleaned and preprocessed by handling missing values, removing outliers, and converting date columns to date time format.

2. **Feature Engineering**: Various technical indicators such as Moving Averages, Bollinger Bands, and Relative Strength Index (RSI) are calculated. Additionally, lagged features, rolling window statistics, and time-based features are engineered.

3. **Machine Learning**: A Random Forest Regressor model is trained on the preprocessed data to predict future stock prices.

4. **Model Evaluation**: The model is evaluated using metrics such as R2 score and Root Mean Squared Error (RMSE).

5. **Technical Indicator**: I used **ta** library in order to apply all technical analysis features as well as indicators in order to increase the accuracy and identify trends, reversals, and potential breakouts. Also it can predict future price movements based on historical data.

6. **Feature Importance**: At the end I used feature importance in order to understand which features drive the predictions, allowing for more informed decision-making and show the most relevant features in case of reducing dimensionality to improve model performance.

7. **Visualization**: Few graphs including a dashboard was built to analyze the performance of the stocks.

**Outcome/Result:** The project resulted in the development of a data-driven investment strategy, supported by a dashboard for tracking stock performance and machine learning models for predicting stock trends. The main goal is to identify promising stocks for investment and build a predictive model to forecast future stock prices.