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**Department:** ECE

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## 1.Problem Statement

Stock market investments are often influenced by unpredictable factors, making it challenging for Investors to make informed decisions. The project aims to develop a predictive model using AI and Time series analysis to forecast stock prices. Accurate forecasting can significantly aid in strategic Investment planning and risk reduction.

## 2.Objectives of the Project

- Build a predictive model to forecast future stock prices.
- Analyze historical stock price trends using time series techniques.
- Evaluate the models accuracy and reliability for real-time predictions.
- Visualize key insights and patterns for better interpretability.

## 3.Scope of the Project

- Features: Historical stock prices (Open, High, Low, Close), Volume, Technical Indicators.
- Limitations: Focus on one or a few selected stocks; use only publicly available datasets; initial deployment as a notebook or web dashboard.

## 4.Data Sources

• Source: Yahoo Finance API

• Dynamic: Data can be fetched in real-time through APIs.

• Public Dataset

## 5.High-Level Methodology

- Data Collection: Via Yahoo Finance API or CSV download from Kaggle.
- **Data Cleaning:** Handle missing values, remove duplicates, and standardize date formats.
- **Exploratory Data Analysis (EDA):** Use line plots, correlation heatmaps, moving averages, etc., to Analyze trends and volatility.
- Model Building: LSTM, ARIMA, Prophet, or Random Forest Regression. LSTM is well-suited due To its ability to model temporal dependencies.
- **Feature Engineering:** Add technical indicators like RSI, MACD, Bollinger Bands, and rolling Averages.

- **Model Evaluation:** Use RMSE, MAE, and MAPE as evaluation metrics; train-test split or Rolling-window cross-validation.

- **Visualization & Interpretation:** Use matplotlib, seaborn, and plotly for interactive dashboards or Static graphs.

## 6.Tools and Technologies

- Programming Language: Python
- Libraries: pandas, numpy, seaborn, matplotlib, scikit-learn, TensorFlow/Keras, statsmodels,yfinance
- Notebook/IDE: Jupyter Notebook
- Deployment Tools (Optional): Streamlit or Flask

## 7.Team Members and Roles

- P.G Yuvaraj - Data Collection, Cleaning, and Modeling
- M. Ramana - EDA, Feature Engineering
- M. Poornachadran - Model Evaluation, Visualization & Deployment