■ Short Report: Time Series Forecasting of Google Stock Prices

■ Objective

The goal of this project was to forecast Google stock prices using time series analysis techniques, with a focus on understanding patterns and building a predictive model.

■ Methodology

1. Data Exploration & Cleaning - Loaded the stock price dataset. - Handled missing values and ensured data consistency. - Visualized trends and patterns in stock prices.

2. Time Series Analysis - Decomposed the series to identify trend and seasonality. - Checked for stationarity and applied necessary transformations.

3. Modeling - Implemented the ARIMA model for forecasting. - Selected parameters (p, d, q) based on ACF/PACF plots. - Trained and validated the model.

4. Evaluation - Compared forecasts with actual data. - Metrics used: RMSE, MAE.

■ Results

- ARIMA provided reasonable short-term forecasts. - The model successfully captured trend and seasonality. - Accuracy was sensitive to parameter selection.

■ Challenges

- Choosing the correct ARIMA parameters. - Handling fluctuations and sudden changes in stock price. - Ensuring the data was stationary before modeling.

■ Future Improvements

- Test advanced models (SARIMA, Prophet, LSTM). - Use more features (trading volume, external factors). - Perform hyperparameter tuning for better accuracy.