Phase-1 Submission

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1.Problem Statement

We aim to predict Tesla's stock closing price using past data with machine learning. This helps in making better investment decisions.

2.Objectives of the Project

- Predict Tesla's future stock prices using historical data
- Train ML models for price prediction
- Visualize the actual vs predicted values
- Plan for a simple web app using Streamlit

3.Scope of the Project

- Use only closing prices
- Short-term forecasting
- Static data only, no real-time news or external factors

4.Data Sources

- Dataset: Tesla Stock Data (CSV)
- Source: Nasdaq
- Type: Static Time-Series

Data source link: www.kaggle.com/datasets/kapturovalexander/ferrari-and-tesla-share-prices-2015-2023

5.High-Level Methodology

- **Data Collection**: Used Tesla stock price data from April 2023 to May 2024 in CSV format, containing fields like Open, High, Low, Close, Adjusted Close, and Volume.

- **Data Cleaning:** Verified no missing values. Ensured all price columns were in float format and converted the Date column to datetime. Sorted the data by date for time-series accuracy.

- **Exploratory Data Analysis**: Verified no missing values. Ensured all price columns were in float format and converted the Date column to datetime. Sorted the data by date for time-series accuracy.

- **Modeling**: Applied Linear Regression and Random Forest Regressor using features such as Open, High, Low, and Volume to predict the Close price.

- **Evaluation**: Used MAE, RMSE, and R^2 Score to evaluate model performance. Compared actual vs predicted prices using line plots and residual plots.

- **Deployment**: A Streamlit web app will be created to allow users to upload Tesla stock data and get closing price predictions interactively.

6.Tools and Technologies

- **Language**: Python
- **IDE**: Google Colab / VS Code
- **Libraries**: pandas, matplotlib, seaborn, scikit-learn
- **Optional**: Streamlit for app

7.Team Members and Role

NAME	ROLE	DESCRIPTION
VISHNURAJ.N	Data collection &cleaning	Collected Tesla stock dataset, removed nulls, and formatted data for modeling.
VISHNU.M	EDA & Visualization	Conducted analysis to find trends, correlations, and distribution patterns.
VINISHYAMALA .P	Model Building	Trained Linear Regression and Random Forest models for stock price prediction..
ROSHINI.A	Forecasting & Testing	Evaluated models using MAE, RMSE, and R^2 metrics.
RAGAVI.K	Streamlit Development	Developed an interactive web application . Streamlit