FAANG-TASTIC INSIGHTS: PREDICT STOCK PRICES WITH REGRESSION AND MLFLOW

OVERVIEW:

This project aims to develop an intelligent and user-friendly Streamlit web application that predicts the closing prices of FAANG stocks. Leveraging advanced regression techniques, MLflow, and a user-centric design, the tool empowers financial analysts and retail investors to make data-driven decisions.

KEY FEATURES:

- **Stock Price Prediction**: Predict the closing prices of FAANG stocks using regression models.
- **Streamlit Application**: Interactive UI for entering stock parameters and viewing predictions.
- **MLflow Integration**: Experiment tracking and model comparison.
- **Data Insights**: Visualizations and metrics to aid decision-making

APPROACH:

1. Data Cleaning

- Handling missing values using mean/median imputation.
- Removing outliers using IQR and Z-score methods.
- Encoding categorical variables via one-hot encoding.

2. Exploratory Data Analysis (EDA)

- Generating visualizations such as line charts, scatter plots, and correlation heatmaps.
- Identifying key features using statistical analysis.

3. Model Development

- Building regression models (Linear Regression, Random Forest, Gradient Boosting).
- Normalizing data for optimal model performance.
- Performing train-test splits and hyperparameter tuning.

4. MLflow Integration

- Tracking experiments, metrics, and artifacts.
- Comparing models to identify the best-performing one for deployment.

5. Deployment with Streamlit

- Building an interactive app for users to input stock parameters.
- Loading the pre-trained model and generating predictions in real time.

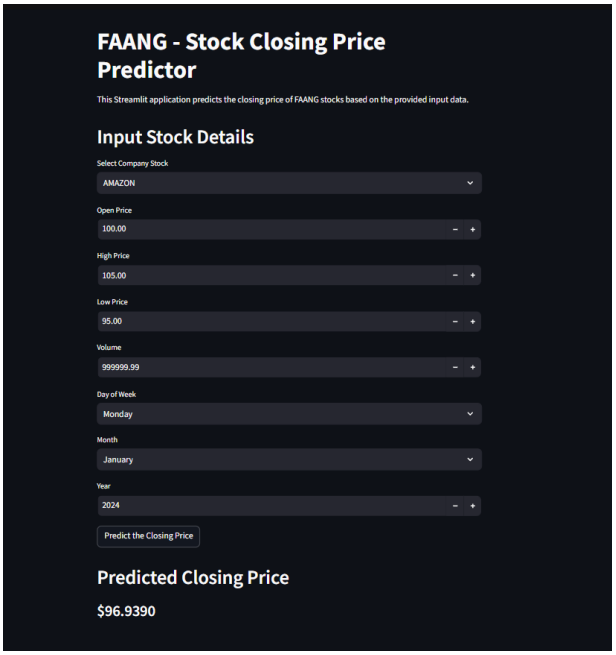
6. Model Evaluation

- Metrics: MAE, RMSE, and R^2 score.
- Ensuring alignment with business objectives.

Project Deliverables

- **Source Code**: Scripts for preprocessing, modeling, and the Streamlit app.
- **Streamlit Application**: Deployed locally or on the web.
- **MLflow UI**: Experiment tracking and performance evaluation.
- **Documentation**: Comprehensive guide on methodologies and usage.

OUTPUT:



CONCLUSION:

The **FAANG-tastic Insights** project successfully combines advanced data science techniques with user-friendly interfaces to empower financial analysts and retail investors. By predicting FAANG stock prices using robust regression models and providing real-time insights through a Streamlit application, this tool simplifies data-driven decision-making in the financial domain.