HOUSE PRICE PREDICTION

- Project-3 | GUVI
- Developed by: Meraj Ali

Introduction

- Real estate prices fluctuate based on many factors.
- Buyers and sellers often struggle to estimate the right price
- **Goal of this project:**
  - Analyze housing dataset
  - Build ML models to predict prices
  - Provide interactive visualizations & predictions via web app

Objectives

- Perform exploratory data analysis (EDA) on housing dataset.
- Visualize relationships between features & price.
- Build Machine Learning models for prediction.
- Create an interactive Streamlit app for end users.

Navigation

Choose the App Mode

Data Analysis & Vi...

🏠 House Price Prediction & Analysis

📊 Data Analysis & Visualization

📋 Dataset Overview

Total Records	Features	Avg Price	Price Range
2000	15	₹1,245,014	₹1,890,774

🔍 Data Preview

☐ Show raw data

📈 Statistical Summary

☐ Show statistical summary

📊 Data Visualizations

Choose Visualization Type

Price Distribution

💰 Price Distribution Analysis

Dataset Overview

- **Source**: enhanced_house_price_dataset.csv
- **Key Features**:

1. Price (target variable)
2. Area, Bedrooms, Bathrooms, Stories, Parking, Age
3. City, Furnishing, Main Road, Guest Room, Basement
4. Water Supply, Air Conditioning, Preferred Tenant, Locality Rating

- Records: ~X rows, Y features

Data Analysis & Visualization

- **Distribution of Prices**
- **Categorical Analysis** (City, Furnishing, etc.)
- **Correlation Heatmap** (numeric features vs price)
- **City-wise Trends** (average price, property counts)

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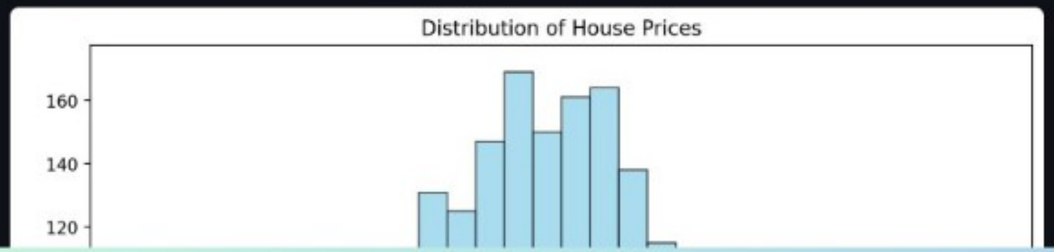
Choose Visualization Type

Price Distribution

Price Distribution Analysis



Navigation

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Categorical Analysis

Price Distribution

Categorical Analysis

Correlation Analysis

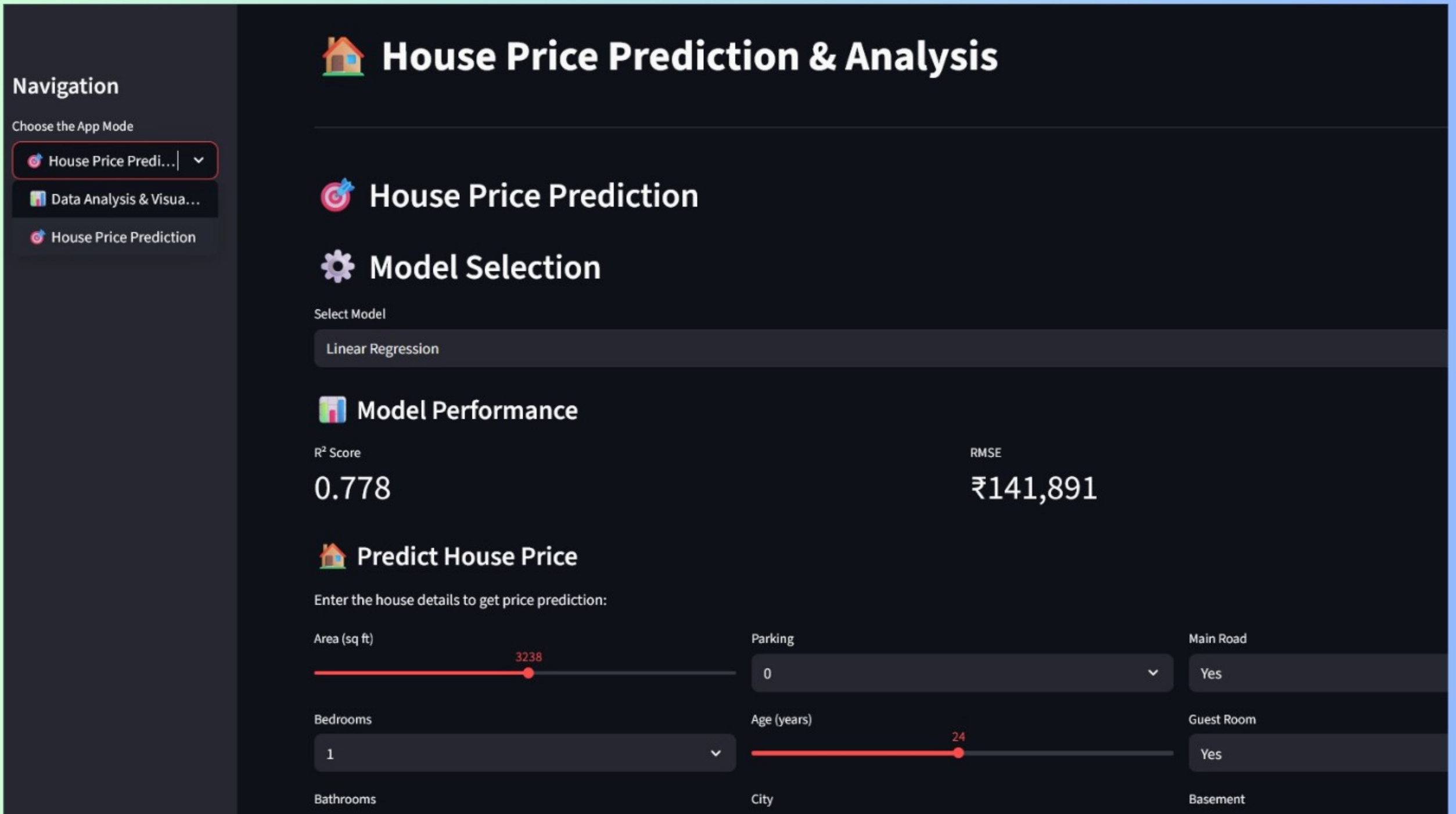
City-wise Analysis

Machine Learning Models

- Models Implemented:
    - Linear Regression
    - Random Forest Regressor
    - Gradient Boosting Regressor
- **GridSearchCV** used for hyperparameter tuning.
- Evaluation Metrics:
- R^2 Score
- RMSE (Root Mean Squared Error)

Results

- Best performing model: e.g., Gradient Boosting (based on R^2 & RMSE).
- Example Performance:
- R^2 Score: 0.745
- RMSE: ₹ 152,054
- Predictions align closely with actual prices.


Navigation
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House Price Predi...
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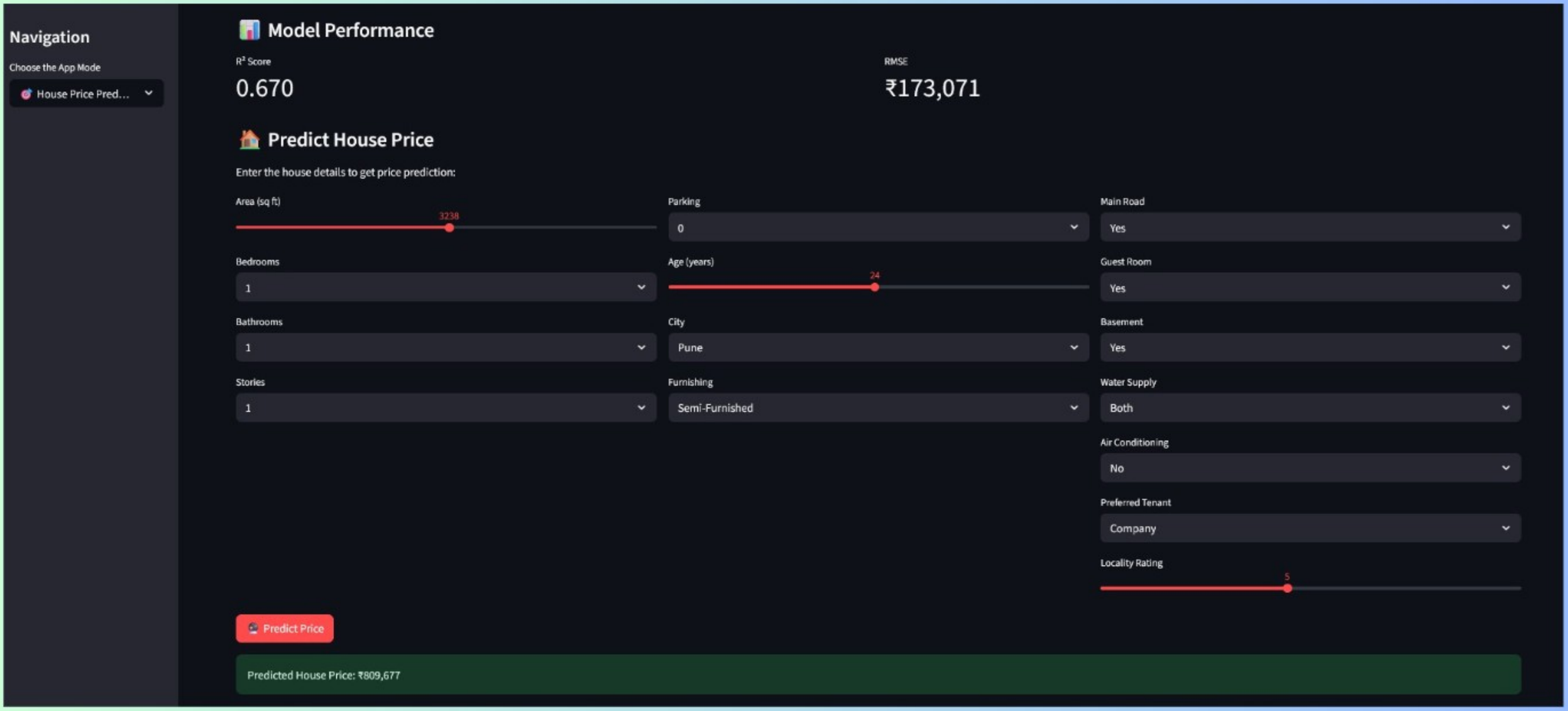
House Price Prediction
House Price Prediction & Analysis
House Price Prediction
Model Selection
Select Model
Linear Regression
Model Performance
R² Score
0.778
RMSE
₹141,891
Predict House Price
Enter the house details to get price prediction:
Area (sq ft)
3238
Parking
0
Main Road
Yes
Bedrooms
1
Age (years)
24
Guest Room
Yes
Bathrooms
City
Basement


Navigation
Choose the App Mode
House Price Pred...
Model Performance
R² Score
0.670
RMSE
₹173,071
Predict House Price
Enter the house details to get price prediction:
Area (sq ft)
3238
Parking
0
Main Road
Yes
Bedrooms
1
Age (years)
24
Guest Room
Yes
Bathrooms
1
City
Pune
Basement
Yes
Stories
1
Furnishing
Semi-Furnished
Water Supply
Both
Air Conditioning
No
Preferred Tenant
Company
Locality Rating
5
Predict Price
Predicted House Price: ₹809,677

Web App (Streamlit)

- Interactive UI with two modes:

1. Data Analysis & Visualization
2. House Price Prediction

- User inputs house details → App predicts price instantly.
- Easy to use, no coding knowledge required.

Deployment

- Deployed on Streamlit Cloud
- Live Demo: https://house-price-prediction-guvi-meraj-ali.streamlit.app/
- Code Repository: https://github.com/Meraj-Ali/House-Price-Prediction-GUVI

Learnings

- End-to-end ML workflow: Data → EDA → Model → Deployment.
- Hyperparameter tuning improves accuracy significantly.
- Importance of feature engineering & categorical encoding.
- Hands-on experience with Streamlit for ML deployment.