

HOUSE PRICE PREDICTION

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A stylized illustration of a blue house with a red roof and a palm tree. The house has a large window with a grid pattern and a smaller window with a cross pattern. The palm tree has green fronds and a brown trunk. The background is a light blue sky with white clouds.

PROJECT OVERVIEW

- Objective: Predict house prices using multiple regression models.
 - Tools Used: Python, Pandas, Scikit-learn, Statsmodels, Matplotlib, Tkinter.
 - Key Output: Interactive GUI for real-time price estimation.
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- A stylized illustration of a pink house with a striped roof and a palm tree. The house has a door with a striped pattern and a window with a striped pattern. The palm tree has green fronds and a brown trunk. The background is a light blue sky with white clouds.

DATA UNDERSTANDING

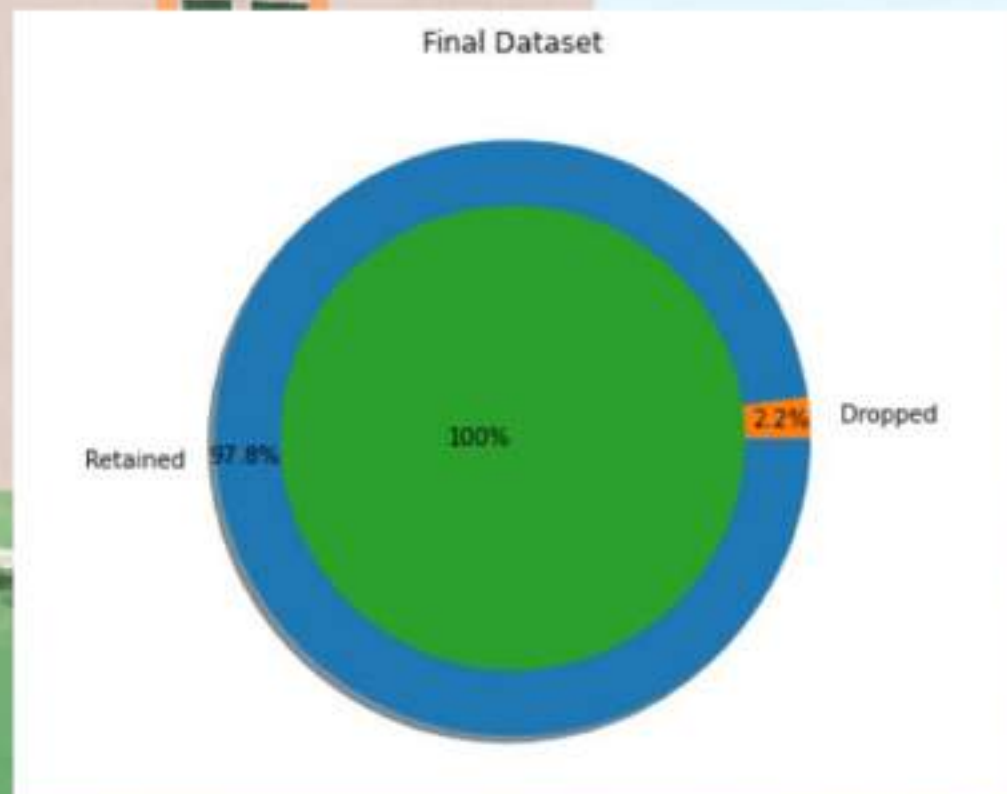
Dataset: Housing.csv
Records: 2180 samples
Target Variable: price

Feature Types:

- Numerical Features: e.g., area, bedrooms
- Categorical Features: e.g., mainroad, furnishingstatus

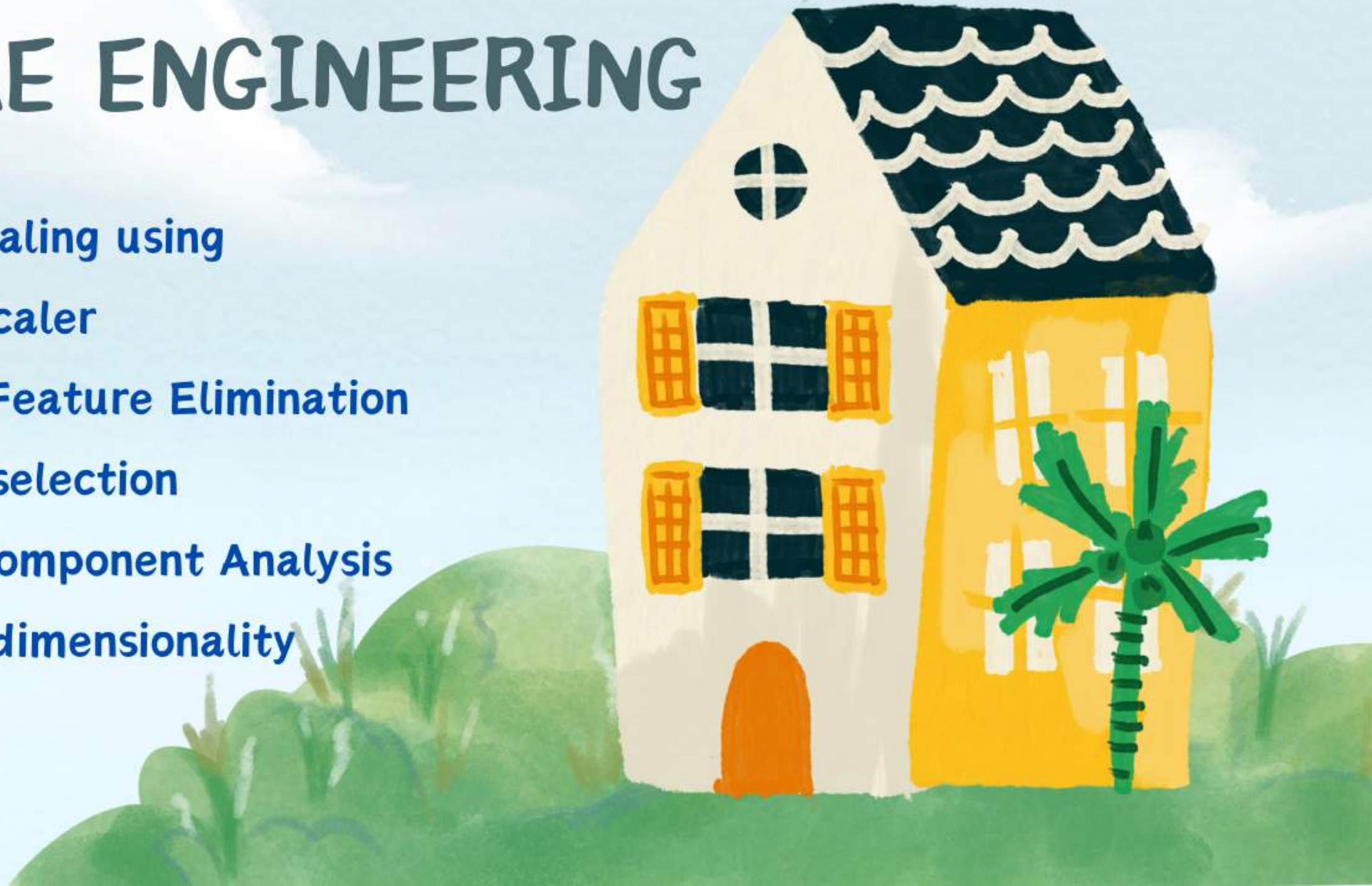
DATA PREPROCESSING

- Removed duplicates and null values
- Handled categorical data with:
 - One-Hot Encoding (Binary)
 - Dummy Encoding (Multiclass)
- Outliers removed using IQR method



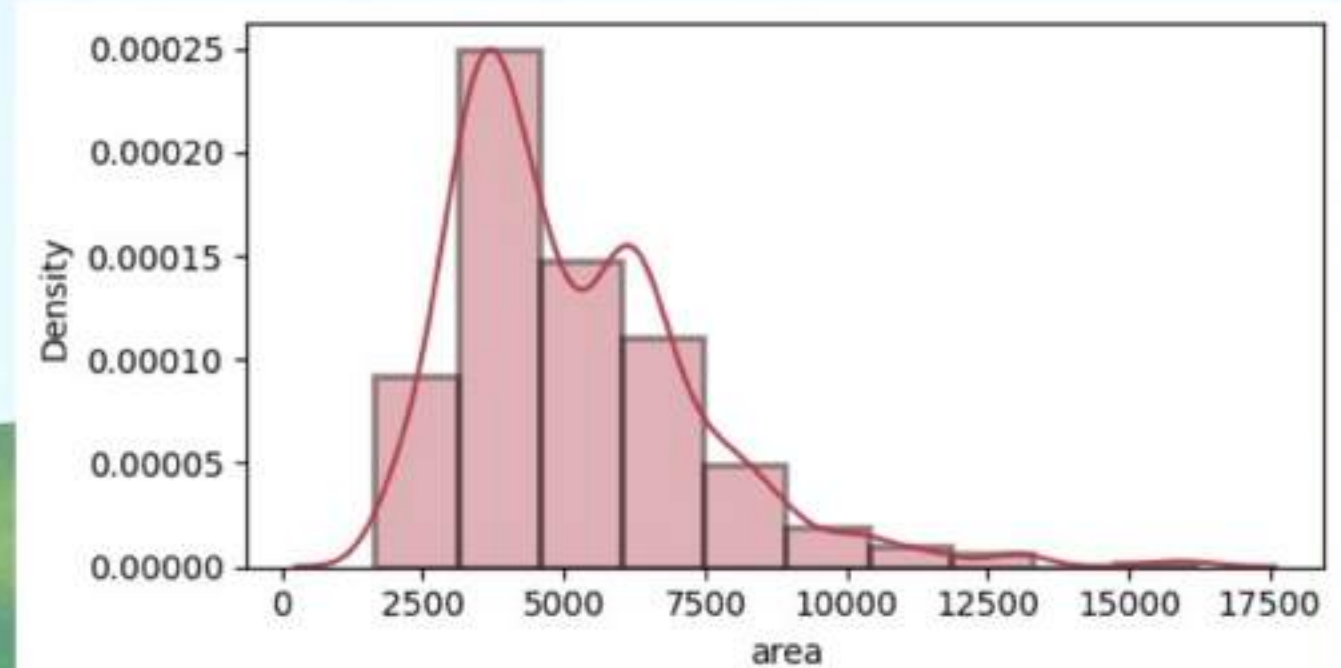
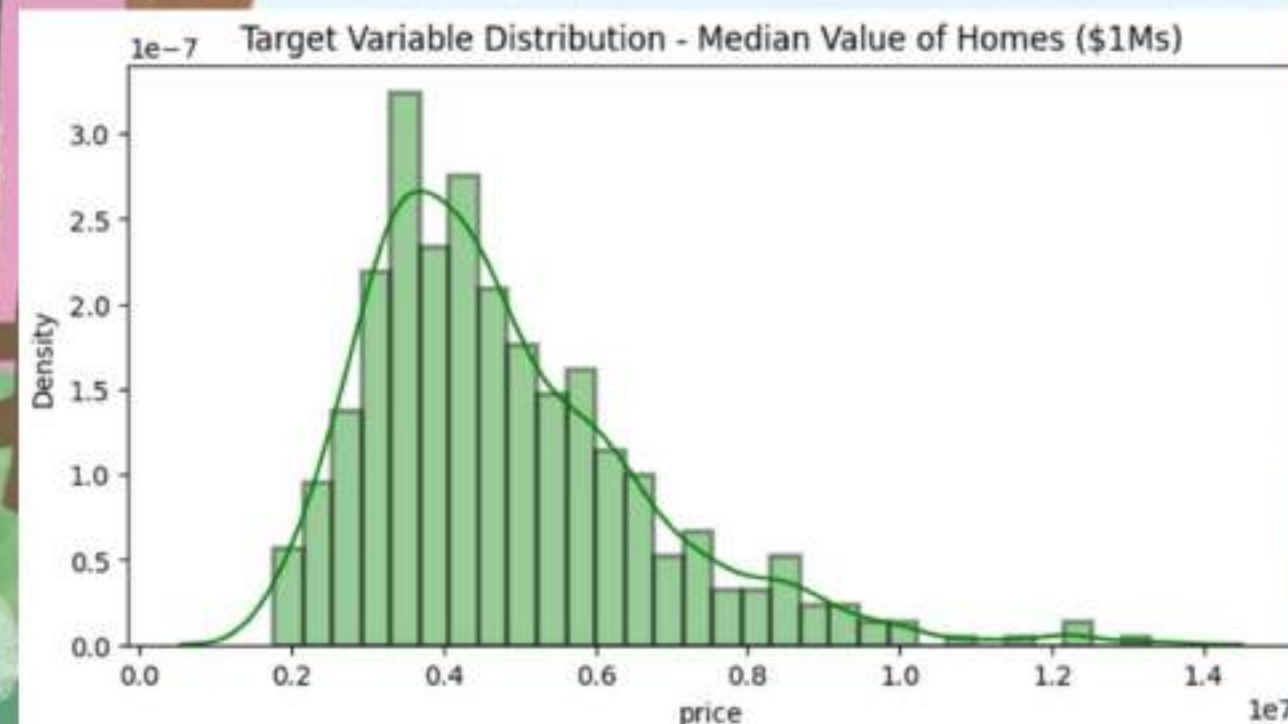
FEATURE ENGINEERING

- Feature Scaling using StandardScaler
- Recursive Feature Elimination (RFE) for selection
- Principal Component Analysis (PCA) for dimensionality reduction



DATA VISUALIZATION

- Your Distribution plots (Histograms, Boxplots)
- Correlation matrix (Heatmap)
- Pairplots for feature relationship
- Pie chart showing data retention post-cleanup paragraph text



REGRESSION MODEL IMPLEMENTED

- Linear Regression (MLR)
- Ridge Regression (RLR)
- Lasso Regression (LLR)
- ElasticNet Regression (ENR)
- Polynomial Regression (PNR)



MODEL EVALUATION METRICS

- Metrics:

R^2 Score

Residual Sum of Squares (RSS)

Mean Squared Error (MSE)

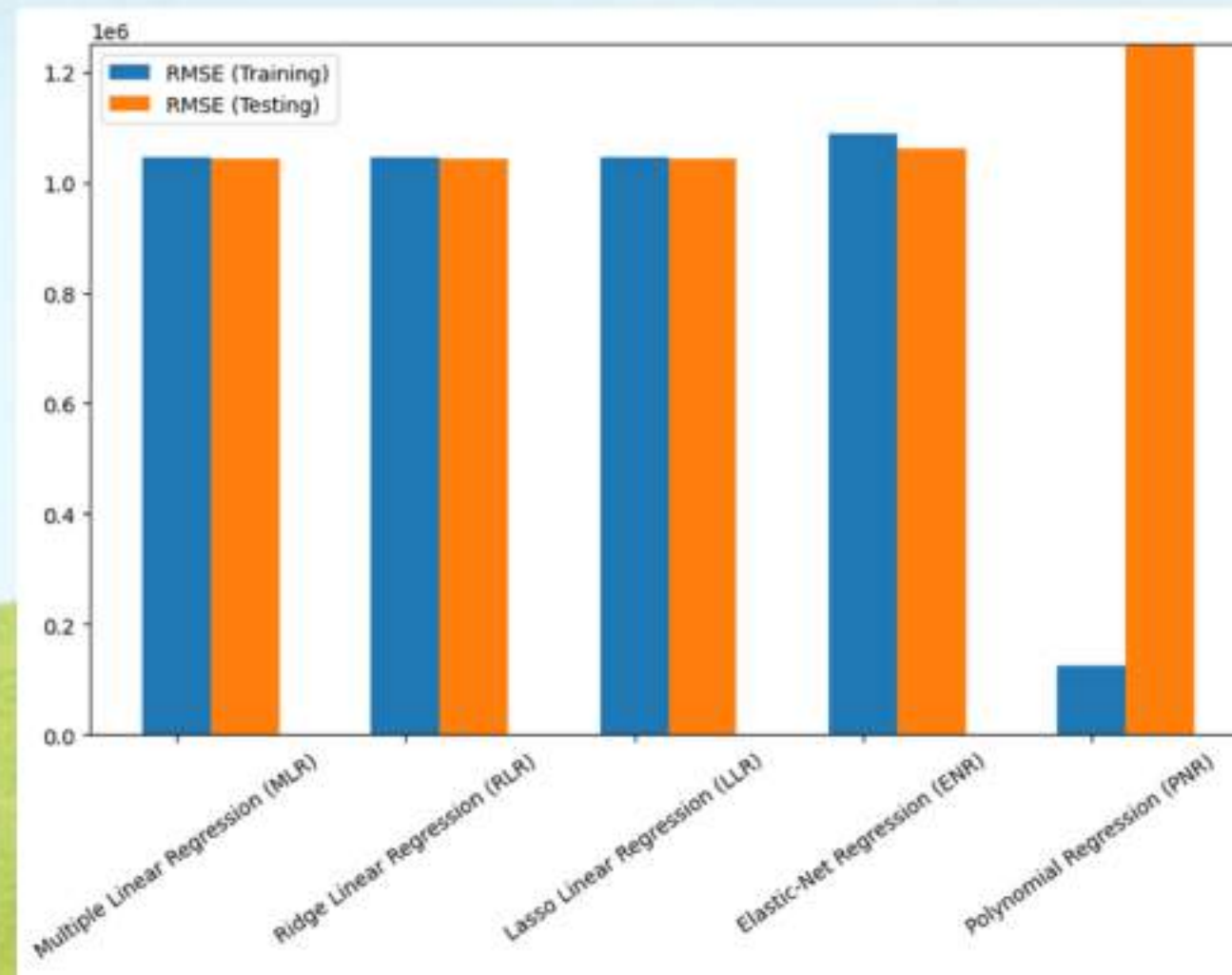
Root Mean Squared Error (RMSE)

- Comparison visualizations for Train/Test performance



MODEL PERFORMANCE SUMMARY

- Ridge and Polynomial models performed best
- RMSE Comparison (Bar chart)
- R^2 Score Ranking (Horizontal line)



GUI APPLICATION-MULYAMAAN

- Built using Tkinter

- Features:

Modern gradient UI

Input for 23 features

Real-time price prediction

Result animation and error handling



DEMO-MULYAMAAN

MULYAMAAN

Enter property details to estimate the market value
अगर घर हो तो मूल्यमान पर प्राइस चेक करके लेंगे

Basic Features Amenities

Area (sq. ft): Total built-up area (500-10000)

Bedrooms: Number of bedrooms (1-6)

Bathrooms: Number of bathrooms (1-4)

Stories: Number of floors (1-4)

Parking Spaces: Covered parking spaces (0-3)

Predict Price

Estimated Value:
₹3,131,991.94

FUTURE WORK

- Include more regional features
- Add deployment to web/mobile apps
- Integrate model retraining via new data



CONCLUSION

- Developed a complete ML pipeline for house price prediction
- Ridge Regression gave the best results
- Integrated model into a user-friendly GUI (MULYAMAAN)
- Enables real-time, reliable price estimation



THANK

YOU!!!