HOUSE PRICE PREDICTION

PRESENTED BY:-

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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.

DATA UNDERSTANDING

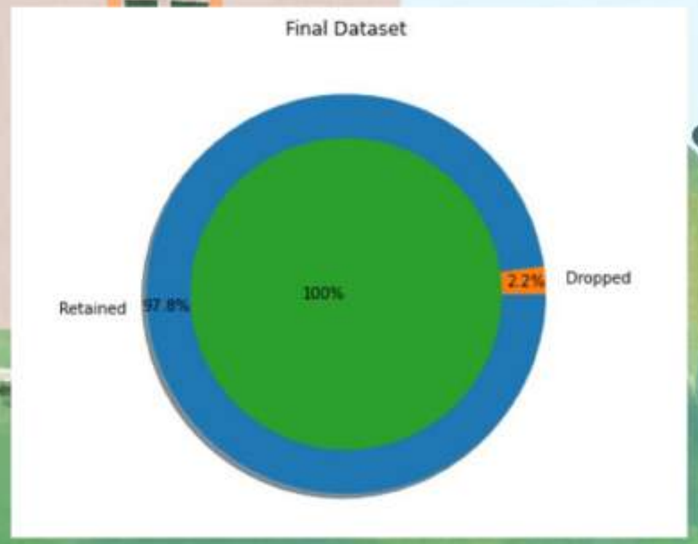
Dataset: Housing.csv
Records: 2180 samples
Target Variable: price

Feature Types:

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

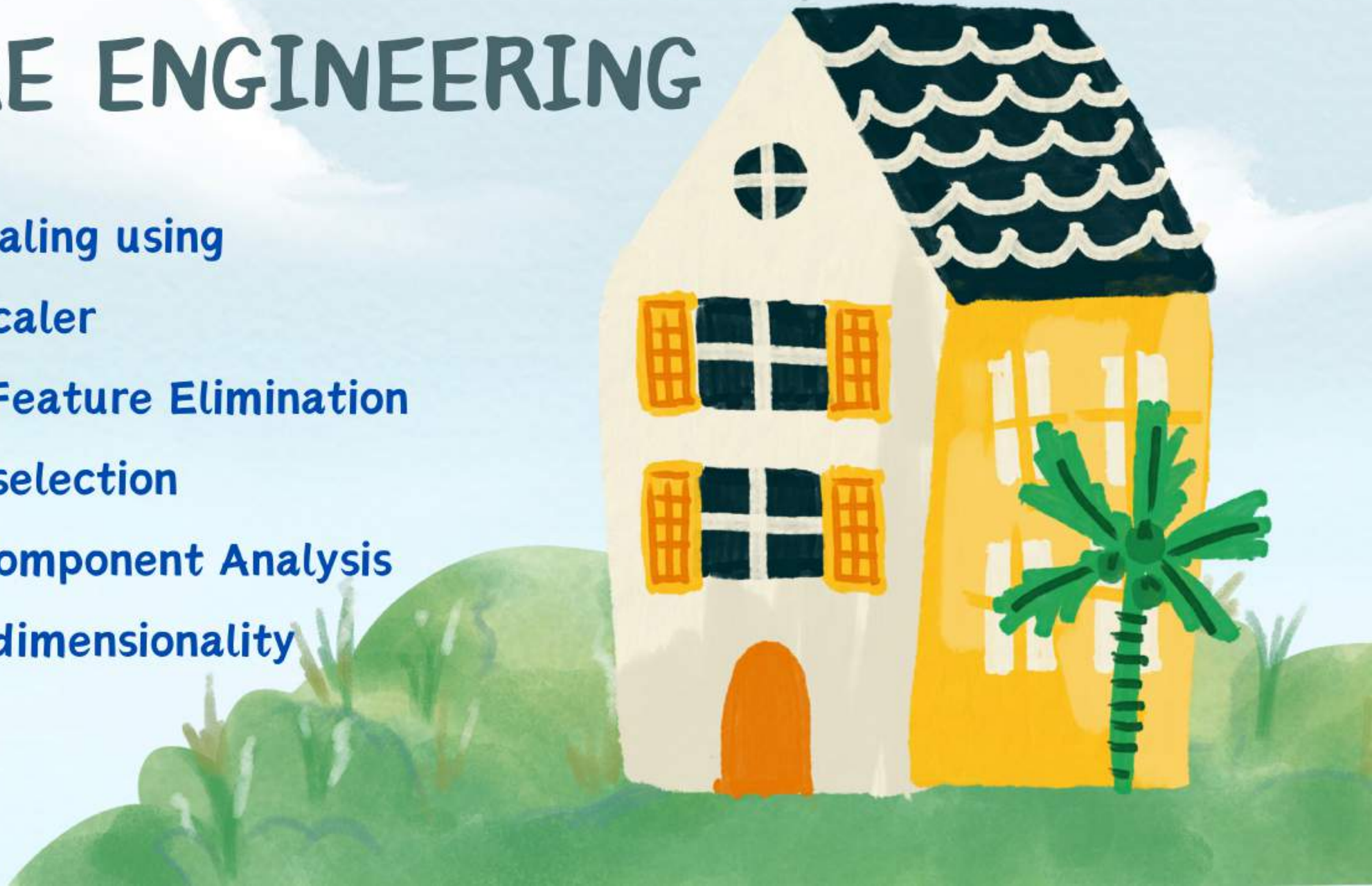
DATA PREPROCESSING

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



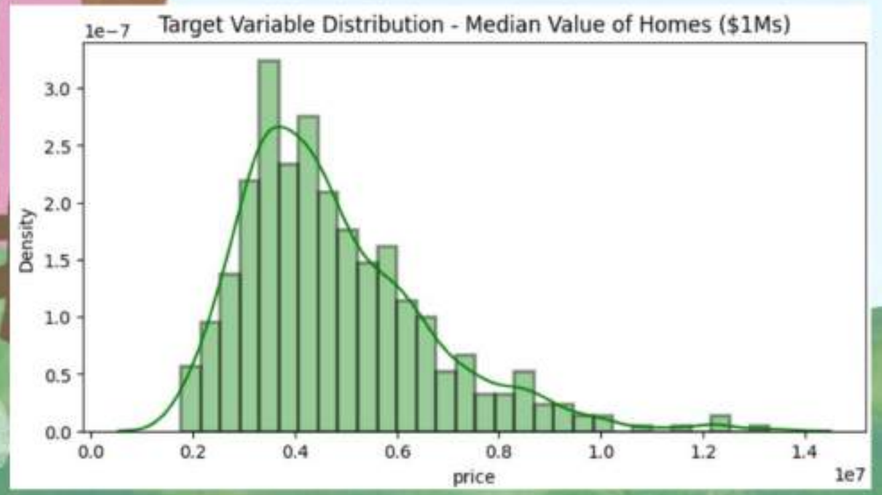
FEATURE ENGINEERING

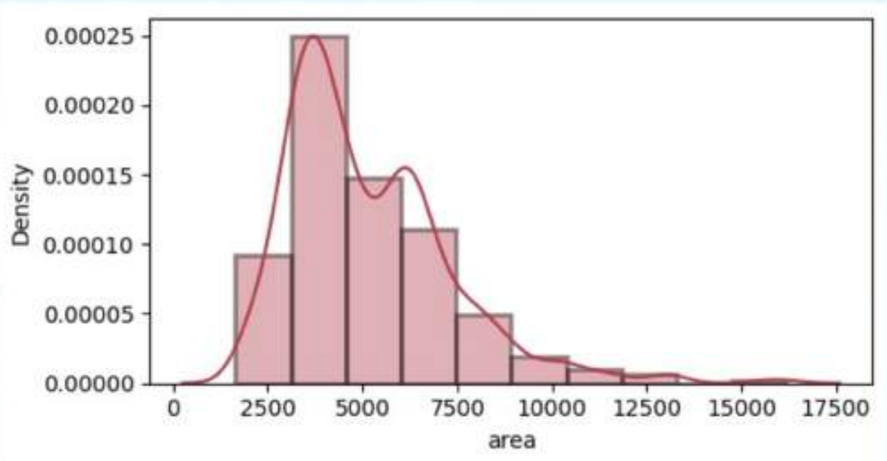
- Feature Scaling using StandardScaler
- Recursive Feature Elimination (RFE) for selection
- Principal Component Analysis (PCA) for dimensionality reduction



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

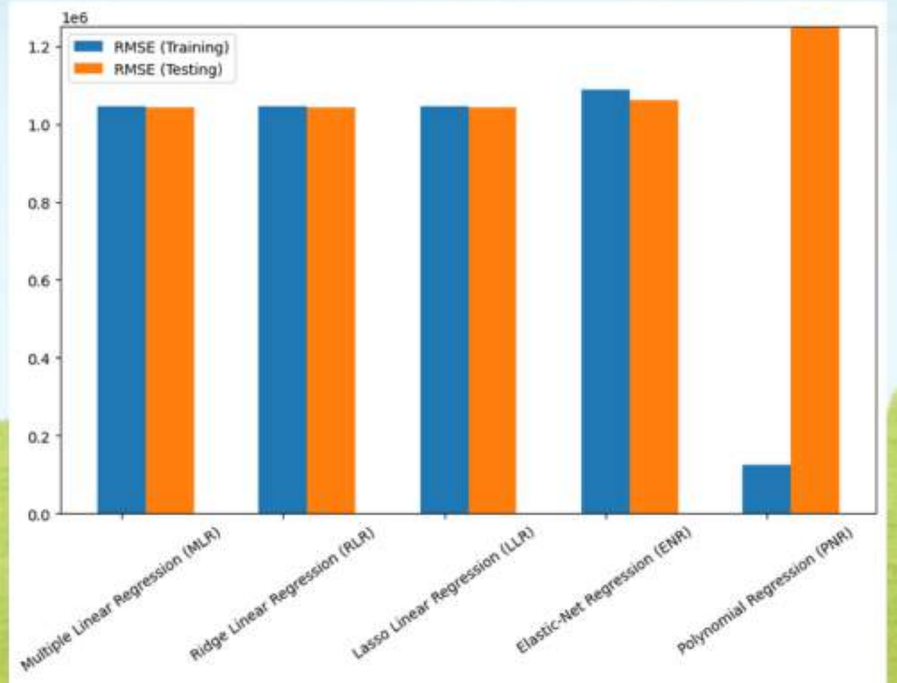
- Linear Regression (MLR)
- Ridge Regression (RLR)
- Lasso Regression (LLR)
- ElasticNet Regression (ENR)
- Polynomial Regression (PNR)

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

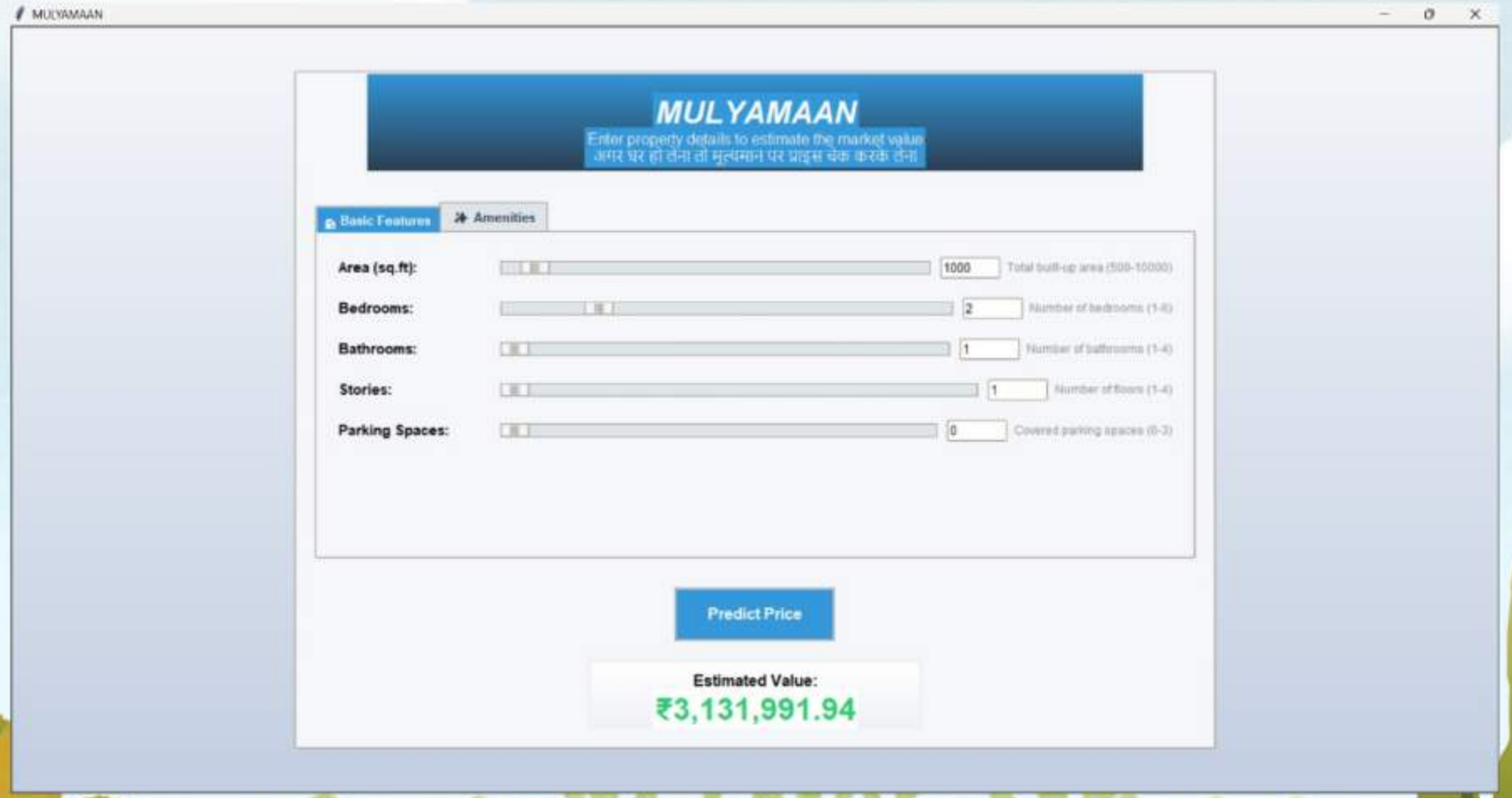
- Ridge and Polynomial models performed best
- RMSE Comparison (Bar chart)
- R^2 Score Ranking (Horizontal line



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

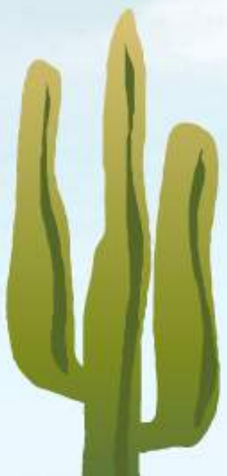


FUTURE WORK

- 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!!