

Department of Computer Science and Engineering

USED CAR PRICE PREDICTION

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Problem Statement and Motivation

Problem Statement

- Accurately predicting the selling price of used cars is challenging due to the influence of multiple categorical and numerical factors.

Motivation

- With the rapid growth of the used car market, automated pricing helps buyers and sellers make informed decisions.
Machine learning enables consistent, data-driven valuation over manual guesswork.

Existing System

- ❑ Traditional car price estimates rely on manual assessment or basic rule-based tools with limited accuracy.
- ❑ Existing platforms often lack personalized predictions based on full feature sets like brand, mileage, engine power, etc.
- ❑ Our ML-based system achieves higher accuracy ($R^2 > 0.91$) by learning from patterns in historical data using advanced regression models.

Objectives

- ❑ To design a data-driven solution for predicting used car prices with high accuracy.
- ❑ Leverage machine learning techniques to handle diverse features like brand, mileage, engine size, etc.
- ❑ Improve prediction reliability over traditional or manual valuation methods.
- ❑ Assist buyers and sellers in making well-informed pricing decisions in the used car market.

Abstract

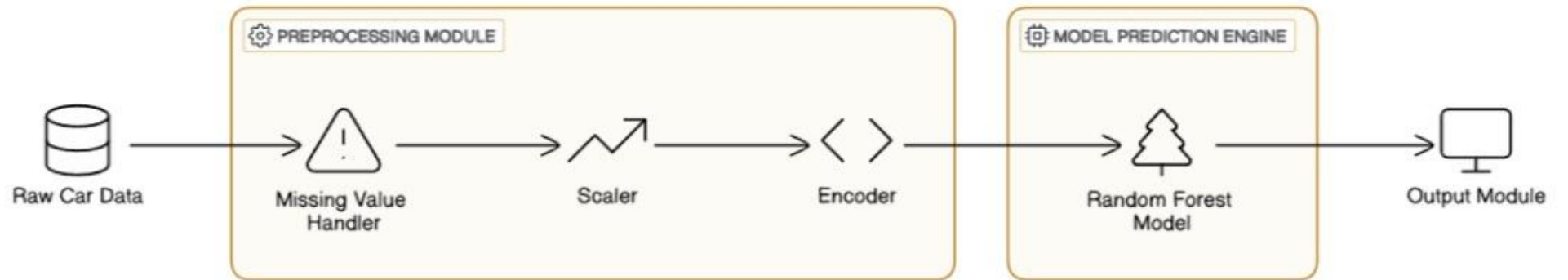
- ❑ This project focuses on predicting used car prices using machine learning techniques applied to the CarDekho dataset.
- ❑ It preprocesses both numerical and categorical data and evaluates multiple regression models for accuracy.
- ❑ The system provides reliable, data-driven price estimates to support smarter buying and selling decisions.

Proposed System

- The system uses a machine learning pipeline combining data preprocessing, feature encoding, and regression models.
- It evaluates Random Forest, Gradient Boosting, and Linear Regression to identify the most accurate predictor.
- The approach ensures automated, consistent, and accurate price predictions based on historical data.

System Architecture

Car Price Prediction System Architecture

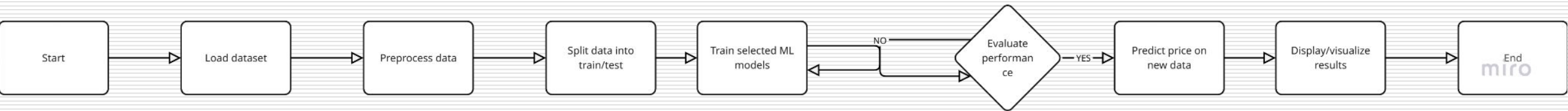


List of Modules

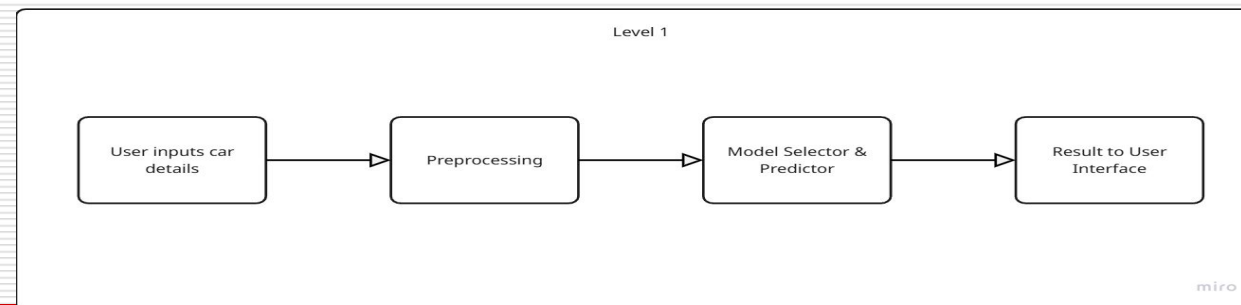
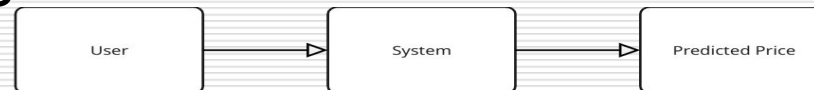
- ❑ **Data Collection & Loading** – Importing and preparing the dataset.
- ❑ **Data Preprocessing** – Handling missing values, encoding, and scaling features.
- ❑ **Model Selection** – Defining and configuring regression models.
- ❑ **Training & Evaluation** – Fitting models, predicting prices, and evaluating performance.
- ❑ **Visualization** – Plotting predictions, residuals, and performance metrics.

Functional Description for each modules with DFD and Activity Diagram

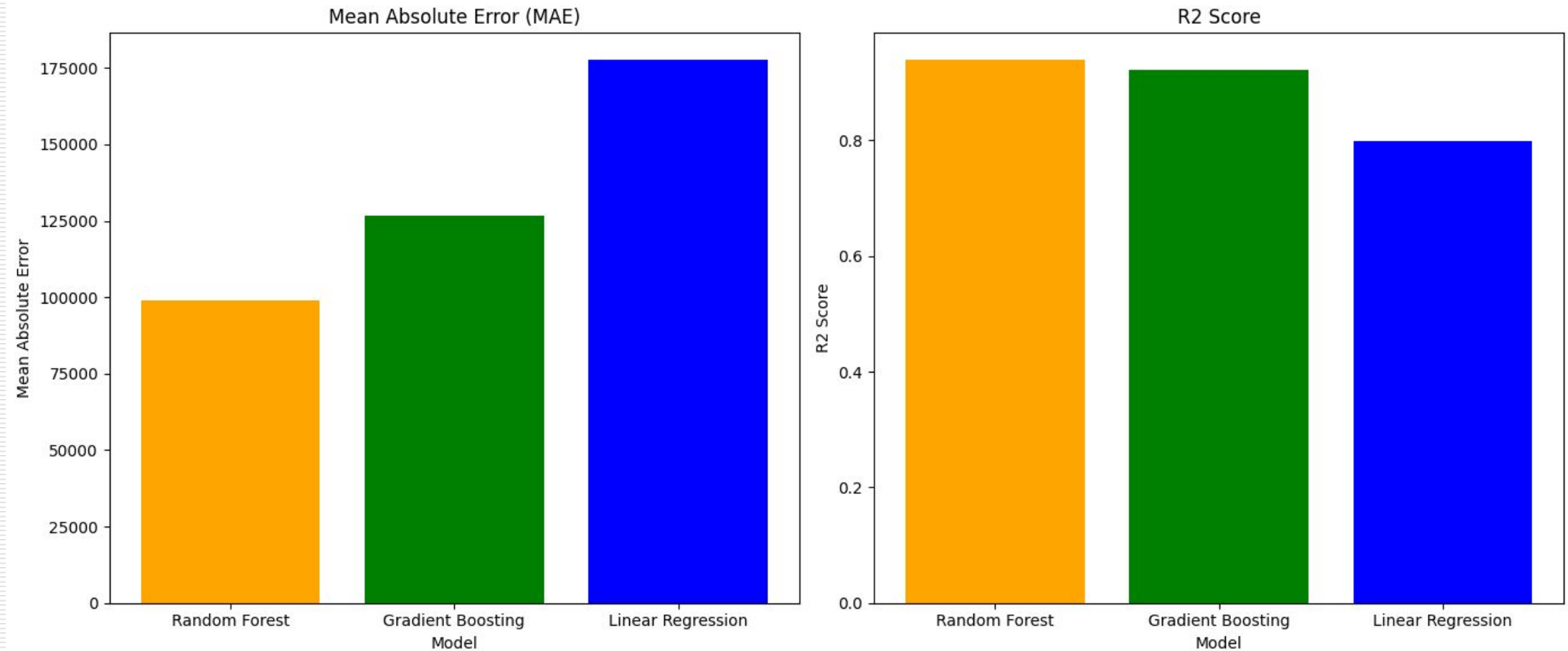
ACTIVITY DIAGRAM:



Data Flow Diagram:



Implementation & Results of Module



Conclusion & Future Work

Conclusion

- ❑ The proposed system effectively predicts used car prices using machine learning with high accuracy.
- ❑ It outperforms traditional methods by leveraging both numerical and categorical data.

Future Work

- ❑ Future improvements can include integrating real-time market data and user feedback.

References

- **Xia, Y., & Wang, L.** (2019). "Car Price Prediction Using Machine Learning Algorithms." *International Journal of Computer Science & Engineering*, 10(5), 102-110.
- **Gonçalves, G., & Silva, E.** (2020). "Predicting Car Prices Using Machine Learning Algorithms: A Comparative Study." *Journal of Big Data Analytics*, 6(2), 88-98.

Paper Publication Status

Full Written Work is done waiting for Final approval from our mentor

Nandrigal pala