



BY :
KARAR DAWD SALMAN
FATIMA QAIS MUHAMMED



INTRODUCTION

This project presents a machine learning-based system for predicting laptop prices using hardware specifications. The model analyzes key components such as CPU, GPU, RAM, storage, screen quality, and brand. Additional performance features—like CPU–GPU interaction, RAM–GPU scaling, and overall performance score—are calculated to improve accuracy.

A Gradient Boosting Regressor is trained on a cleaned laptop dataset and achieves high prediction accuracy. The system is integrated into a user-friendly Tkinter GUI, allowing users to select laptop specifications and receive an instant estimated price.

This project demonstrates how machine learning and feature engineering can be used to create a practical and intelligent price prediction tool.



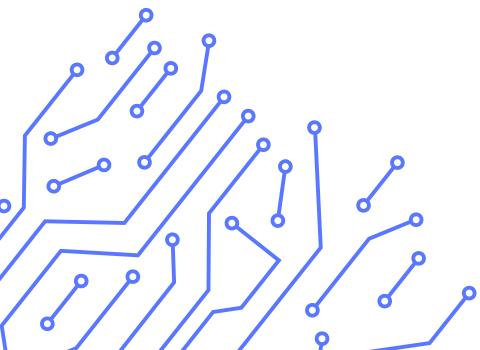


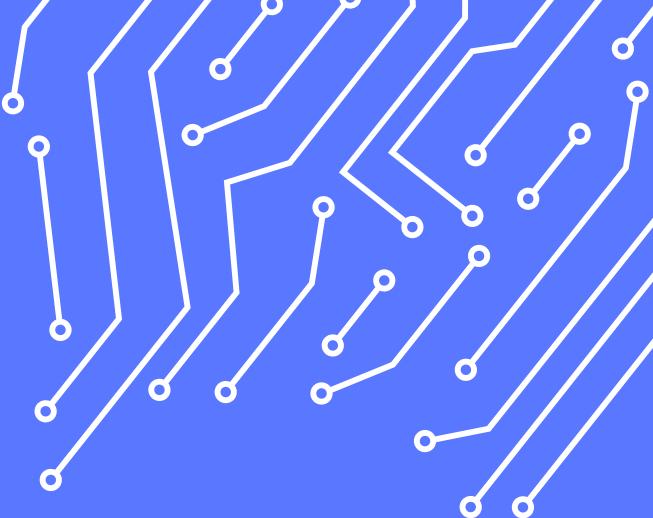
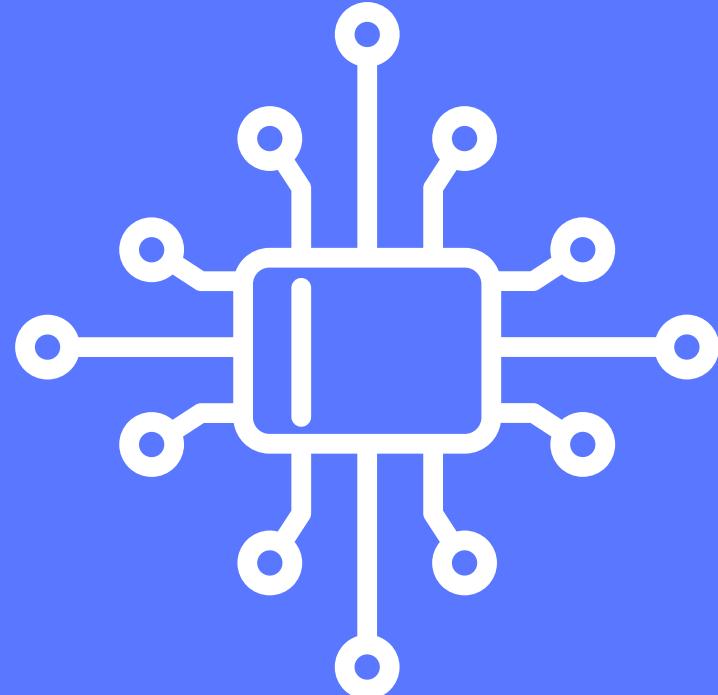
HOW IT WORKS?

- The system cleans the dataset, converts laptop specs into numerical scores, and creates extra performance features like CPU–GPU synergy and RAM–GPU interaction. A Gradient Boosting model is trained on these processed features. In the GUI, the user selects hardware specs, the system transforms them into model-ready values, and the trained model instantly predicts the laptop's price.

PROBLEM STATEMENT

- Laptop prices vary widely depending on hardware specifications, brand, and performance. Buyers often struggle to assess whether a price is fair, and manual evaluation can be inconsistent. This project aims to create a machine learning system that predicts laptop prices accurately based on key specifications, helping users make informed decisions quickly and reliably.





LIBRARIES USED

Tkinter

Pandas

NumPy

scikit-learn

Warnings

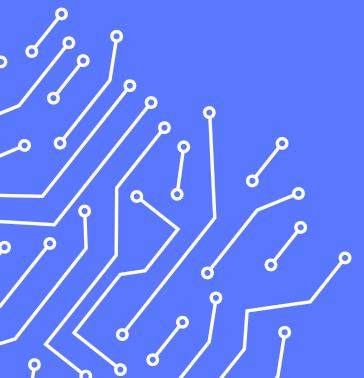
**GUI FOR USER
INPUT AND
DISPLAYING
RESULTS**

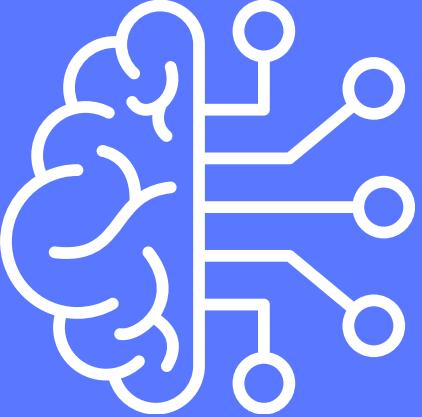
**DATA HANDLING
AND CLEANING**

**NUMERICAL
CALCULATIONS**

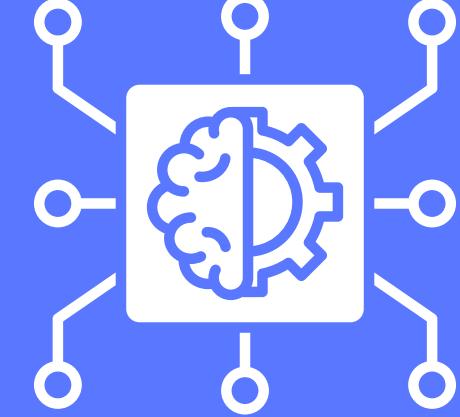
**MACHINE LEARNING
(GRADIENT
BOOSTING,
TRAIN/TEST SPLIT,
STANDARDSCALER)**

**SUPPRESS
UNWANTED
WARNINGS**





SYSTEM ARCHITECTURE



1. User Interface (GUI)

- Built with Tkinter for inputting laptop specifications and displaying predicted prices.

2. Data Processing Module

- Cleans the dataset, converts RAM and storage to numeric values, and maps CPU, GPU, brand, screen, and RAM type to scores.
- Calculates additional features: RAM_GPU, CPU_GPU, and Total_Perf.

3. Machine Learning Module

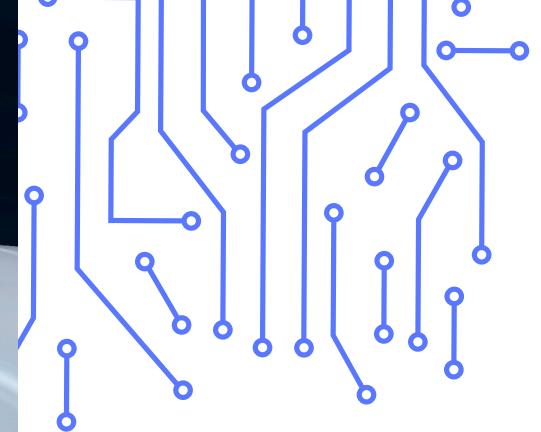
- Standardizes features using StandardScaler.
- Trains a Gradient Boosting Regressor to predict prices.

4. Prediction & Output

- User inputs are transformed into model-ready features.
- The trained model predicts the laptop price and displays it with accuracy metrics in the GUI.

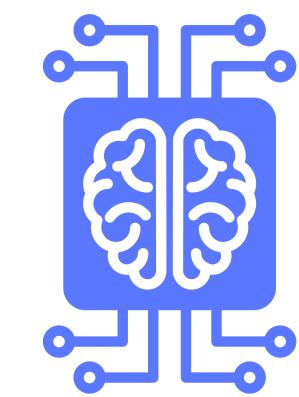
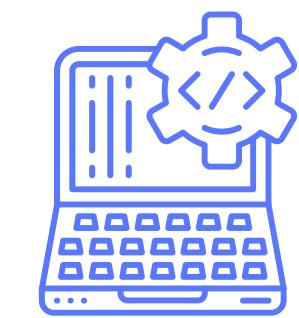
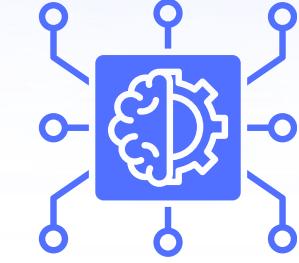
CONCLUSION

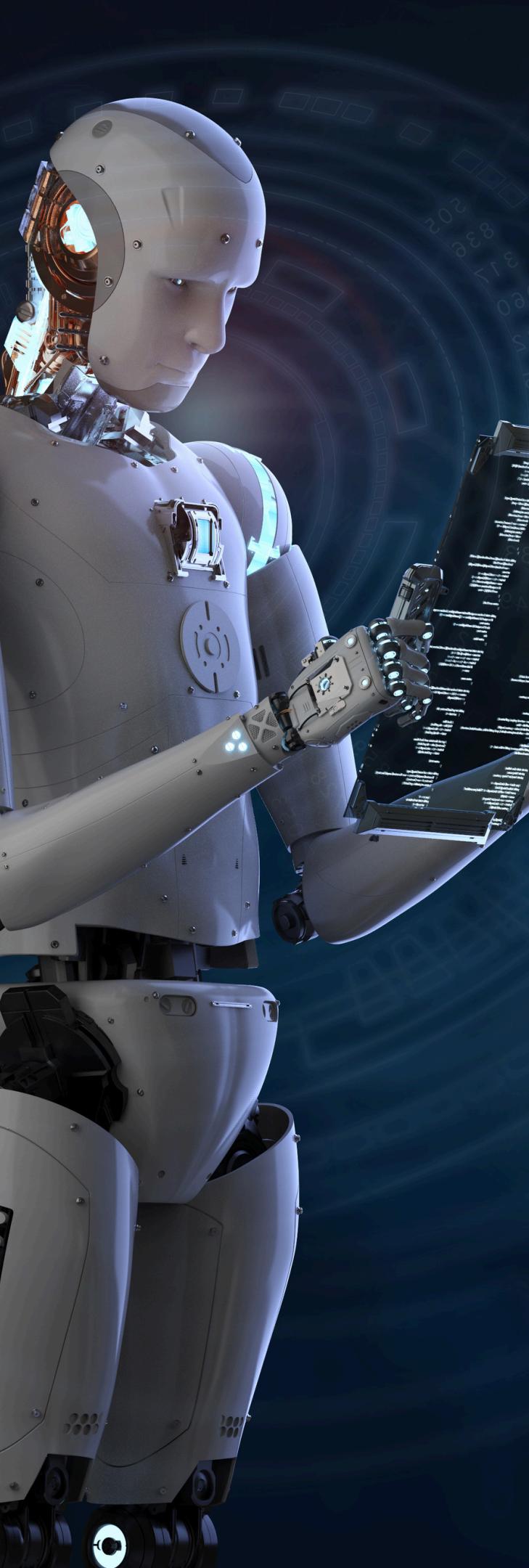
This project demonstrates how machine learning can accurately predict laptop prices based on hardware specifications and brand. By using feature engineering—such as CPU–GPU synergy, RAM–GPU interaction, and overall performance—the Gradient Boosting model captures real-world hardware performance relationships. The Tkinter GUI provides a user-friendly interface for instant price estimation, helping users make informed decisions when buying or evaluating laptops.



FUTURE WORK

WE CAN MAKE AN MOBLIE APPLICATION OR WEB SITE THAT INCLUDE THE SHOPS AND THERE DATABASE FOR THE ITEMS AND THERE PRICES AND THIS APPLICATION CAME WITH THIS AI PREDICTOR TO HELP PEAPLE TO NOW THE ACTUEL [RICE OR THE CLODE ONE





THANK YOU

The future lies in collaboration between
people and intelligent systems.