Project Title :

Laptop Price Prediction – Machine Learning Project

This project is designed to build a complete machine learning solution that predicts laptop prices based on their technical specifications and hardware configurations. The goal is not only to predict prices accurately but also to understand how different components influence laptop pricing in the real market. This project reflects a practical, industry-oriented approach to data analysis and machine learning.

📘 Project Overview

The dataset used in this project contains detailed information about laptops, including brand, processor, RAM, storage type and capacity, screen size, screen resolution, GPU, operating system, and price. The project follows the complete machine learning pipeline starting from raw data preprocessing to model evaluation.

🖌️ Data Preprocessing & Feature Engineering

Extensive data cleaning was performed to handle missing values, inconsistent data formats, and irrelevant features. Screen resolution values were split into horizontal and vertical components, and Pixels Per Inch (PPI) was calculated to better represent display quality. CPU information was simplified into meaningful categories such as Intel Core i3, i5, i7, Other Intel Processors, and AMD Processors to improve model learning.

📊 Exploratory Data Analysis (EDA)

Exploratory Data Analysis was conducted to identify patterns and relationships between laptop prices and hardware features. Various visualizations were used to analyze the impact of RAM, processor type, storage, brand, and display specifications on laptop pricing.

🤖 Model Building & Evaluation

Multiple regression models were trained and evaluated to predict laptop prices. Model performance was compared using appropriate evaluation metrics, and the best-performing model was selected based on accuracy and generalization capability.

🛠️ Tools & Technologies Used

Python, Pandas, NumPy, Scikit-learn, Matplotlib, Seaborn

🎯 Key Skills Gained

Data Cleaning, Exploratory Data Analysis (EDA), Feature Engineering, Regression Modeling, Machine Learning Workflow, Model Evaluation