**Project Information**

* **Title**: laptop dataset
* **Name**: Rahul Nikshai
* **DA/DS**: Data Analyst
* **Batch Number**: RB-36
* **Online/Offline**: Offline
* **Roll Number**: BCA1025

**1. Introduction**

This project uses Python tools to explore a dataset related to laptop specifications and sales. The goal is to clean, analyze, and visualize the data to identify trends and insights that can help businesses make smarter inventory and marketing decisions.

**2. Objective**

To perform exploratory data analysis on laptop sales data and find patterns between features such as brand, RAM, price, and offers. The final aim is to use data insights to enhance product bundling, pricing, and stock management.

**3. Business Challenge**

Laptop sellers struggle to identify which specs boost customer interest. This dataset includes specs like RAM, processor, storage, and accessories. The task is to explore and uncover trends such as whether bundling accessories boosts the sales of low-RAM laptops.

**4. Workflow Summary**

* Import dataset
* Clean data
* Add useful metrics
* Apply statistical and visual analysis
* Extract business insights and give recommendations

**5. Data Overview**

Features include brand, RAM, storage, price, OS, weight, and offers. Basic checks help identify missing values and understand data distribution before further analysis.

**6. Data Cleaning Steps**

* Filled missing values using statistical methods
* Treated outliers with IQR/z-score techniques
* Standardized inconsistent entries and removed duplicates

**7. Derived Metrics**

Created new columns like:

* price\_per\_gb: Price divided by RAM
* has\_offer: Indicates presence of accessories
* Converted weight to kilograms
* Extracted brand from model info

**8. Filtering Logic**

Excluded laptops priced below ₹10,000 or above ₹2,00,000 and those missing critical specs. Focused on valid entries to improve insight accuracy.

**9. Statistical Insights**

Used descriptive stats and hypothesis tests (t-tests, chi-square) to validate relationships, such as accessories affecting pricing and brand-preference trends.

**10. EDA Breakdown**

* **Univariate**: Examined individual features with histograms and bar charts
* **Bivariate**: Explored pairs of variables like RAM vs price
* **Multivariate**: Analyzed multiple variables using catplots and correlation heatmaps

**11. Key Findings**

* 2GB RAM laptops sell well with accessories
* Lightweight, 4GB+ RAM models preferred
* Bundled accessories raise perceived value
* SSDs favored over HDDs
* Some brands dominate budget segments

**12. Conclusion**

EDA provided valuable insights to improve laptop sales through smarter pricing, bundling, and inventory strategies. Python proved effective in turning raw data into actionable business understanding.