Report on Online Coupon Sales Analysis

1. Introduction

This project analyzes **online coupon sales** to understand trends in **customer engagement, coupon usage, and sales patterns**. The dataset includes **product categories, coupon types, sales amounts, and customer interactions** over multiple years.

2. Data Cleaning and Preprocessing

- Checked for missing values and found **5% missing data** in sales, coupon usage, and engagement columns.

- Filled missing values using the **median** to maintain data consistency.

3. Analysis and Insights

3.1 Customer Engagement by Product Category

- **Electronics** had the **highest customer engagement (54.28)**, followed by **Beauty (53.06)** and **Home Decor (50.07)**.

- **Fashion had the lowest engagement (46.17)**, suggesting less interest in coupon-based shopping.

3.2 Most Used Coupon Types (Year-Wise)

- **Discount Coupons** were the most used in **2021 & 2022**.

- **Loyalty Points** were most popular in **2023**.

- **Cashback Coupons** were the most used in **2024**, showing a shift in customer preferences.

3.3 Coupon Usage by Product Category

- **Beauty & Home Decor** saw the **highest usage of Discount Coupons**.

- **BOGO Coupons** were preferred for **Electronics and Grocery products**.

- **Cashback Coupons** were used more for **Home Decor**.

3.4 Monthly Sales Trends

- **August had the highest sales (27,253.5)**, followed by **May and June**.

- **December had the lowest sales (18,575)**, indicating fewer coupon-based purchases at year-end.

4. Visualizations Used

- **Bar Charts** for **Customer Engagement & Coupon Usage**.

- **Stacked Bar Chart** for **Coupon Usage by Product Category**.

- **Line Graph** for **Monthly Sales Trends**.

5. Conclusion

- **Electronics and Beauty categories** engage more customers with coupons.

- **Cashback & Discount Coupons** are the most popular types.

- **Sales peak during mid-year (May–August), while year-end sees a decline**.

- Businesses should **focus on cashback deals and mid-year promotions** for better engagement.