E-Commerce Data Insights - Project Report

Project Overview

This project explores and analyzes e-commerce data to uncover actionable business insights such as top-selling products, peak purchasing hours, user retention trends, and highest-rated products. These insights help e-commerce platforms improve inventory planning, marketing strategies, and customer loyalty programs.

Objective

To analyze sales and user data in order to identify products driving the highest revenue, determine peak purchase times, measure user retention, and highlight top-rated products.

Datasets Used

- products.csv: Product ID, name, and price
- users.csv: User ID and basic info
- orders.csv: Order ID, user/product IDs, quantity, date
- reviews.csv: Product ratings by users

Key Insights

- Top Products by Revenue: Product_3, Product_4, Product_5
- Peak Purchase Hour: 2 PM
- User Retention: 100% of users made repeat purchases
- Top Rated Product: Product_10

Tech Stack & Tools

- Languages: Python
- Libraries: pandas, seaborn, matplotlib, plotly
- Visualization: Bar charts, line plots, and summary tables

Features

- Merges multi-source e-commerce data into a single view

- Generates clean summaries of key metrics

- Supports visual storytelling via plots (optional)

- Highlights users to reward and products to stock

How to Run

1. Place products.csv, users.csv, orders.csv, and reviews.csv in the same folder.

2. Run the Python script: python ecommerce_insights.py

3. View the printed insights and visual outputs.

Conclusion

This project helps e-commerce businesses make data-backed decisions about inventory management, customer engagement, and sales optimization. Use this dashboard to grow smarter, not just bigger.

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