

✓ README for eCommerce Transactions Analysis Assignment

Overview

This project involves analyzing an eCommerce transactions dataset to extract meaningful insights, develop a customer lookalike model, and perform customer segmentation. The goal is to demonstrate expertise in exploratory data analysis (EDA), predictive modeling, and clustering techniques while delivering actionable business insights.

Dataset Details

The project uses three files:

1. Customers.csv

- CustomerID : Unique identifier for customers.
- CustomerName : Name of the customer.
- Region : Continent where the customer resides.
- SignupDate : Date of customer signup.

2. Products.csv

- ProductID : Unique identifier for products.
- ProductName : Name of the product.
- Category : Product category.
- Price : Product price (USD).

3. Transactions.csv

- TransactionID : Unique identifier for transactions.
 - CustomerID : Associated customer.
 - ProductID : Associated product.
 - TransactionDate : Date of the transaction.
 - Quantity : Quantity purchased.
 - TotalValue : Transaction total value.
 - Price : Product price in the transaction.
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Tasks and Deliverables

1. Exploratory Data Analysis (EDA)

- Clean and merge datasets to create a unified view.
- Visualize key metrics like revenue trends, regional contributions, and product performance.
- Derive actionable insights for marketing, inventory management, and customer engagement.
- Deliverables:

- Jupyter Notebook with EDA code and visualizations.
- PDF report with business insights.

2. Lookalike Model

- Build a machine learning model to recommend 3 similar customers based on profile and transaction history.
- Use customer and product data to calculate similarity scores.
- Deliverables:
 - Lookalike.csv containing similarity scores for the first 20 customers.
 - Jupyter Notebook explaining model development and results.

3. Customer Segmentation

- Perform clustering using customer profile and transaction data.
- Evaluate clusters using metrics such as DB Index.
- Visualize clusters and provide actionable recommendations for targeting each segment.
- Deliverables:
 - Jupyter Notebook with clustering analysis and visualizations.
 - Report including the number of clusters, DB Index value, and other metrics.

Key Tools and Technologies

- **Python Libraries:**
 - Pandas, NumPy for data manipulation and cleaning.
 - Matplotlib, Seaborn for visualization.
 - Scikit-learn for machine learning models and clustering.
- **Jupyter Notebook:** Used for coding, analysis, and visualization.

Expected Results

- Comprehensive understanding of revenue drivers, customer behavior, and sales trends.
- A functional customer similarity model with meaningful recommendations.
- Segmentation of customers into actionable groups for targeted marketing and product strategies.

How to Run

1. Clone this repository.
2. Install the required libraries using `pip install -r requirements.txt`.
3. Open the provided Jupyter Notebooks (EDA.ipynb, Lookalike_Model.ipynb, Clustering.ipynb) to explore the analyses.
4. View the generated reports for business insights and recommendations.

Potential Use Cases

- Optimizing marketing campaigns by targeting high-value customers.
 - Personalizing product recommendations using the lookalike model.
 - Enhancing operational efficiency by addressing seasonal trends and product return rates.
 - Designing strategies for untapped regional markets and underperforming products.
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Let me know if this needs further elaboration!

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