

Customer Segmentation using RFM model

Exclusive Summary:

This project focuses on analysing an invoice dataset using the RFM (Recency, Frequency, Monetary) model to segment customers based on purchasing. The goal is to identify high-value customers, optimize marketing strategies, and improve customer retention. By using data analytics and machine learning, businesses can enhance decision-making and customer relationship management.

Problem Statement:

Businesses need to understand customer purchasing behaviours to maximize revenue and improve marketing effectiveness. Traditional segmentation methods may not be efficient in identifying key customers. This project aims to apply the RFM model to classify customers based on their purchasing patterns and provide usable insights for targeted marketing strategies.

Data Source:

The dataset consists of invoice data containing transaction details such as invoice numbers, product codes, descriptions, quantities, invoice dates, unit prices, customer IDs, and country of purchase. This data will be used to compute RFM scores for customer segmentation.

Methodology:

1. Data Preprocessing:

- Handle missing values and duplicates.
- Convert invoice dates into proper date-time formats.

2. RFM Analysis:

- **Recency:** Calculate the number of days since the last purchase for each customer.
- **Frequency:** Count the total number of purchases made by each customer.
- **Monetary:** Compute the total revenue generated by each customer.
- Normalize and rank customers based on RFM scores.

3. Customer Segmentation:

- Use clustering techniques (K-Means) to segment customers.
- Identify high-value, frequent, and at-risk customers.

4. Predictive Insights:

- Analyse customer behaviour trends over time.
- Forecast future purchasing potential.
- Develop personalized recommendations based on RFM segments.

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Expected Outcome:

- Identification of high-value customers for targeted strategies.
- Improved marketing efficiency by segmenting customers based on their purchasing behaviours.
- Enhanced customer relationship management through personalized outreach.

Tools and Technology:

- **Programming Language:** Python.
- **Libraries:** Pandas, NumPy, Scikit-learn, Matplotlib, Seaborn.
- **Data Processing:** Google Colab.
- **Machine Learning:** RFM model ,K-Means Clustering.
- **Visualization Tools:** Matplotlib, Seaborn from python.

Risk and Challenges:

- **Data Quality Issues:** Missing or incomplete transaction records impacting RFM scores.
- **Customer Behaviour Variability:** Changes in purchasing habits affecting segmentation accuracy.
- **Scalability:** Efficiently processing large-scale transaction data.

Conclusion:

RFM analysis enables businesses to effectively segment their customers and implement targeted marketing strategies. By using transactional data, companies can identify key customers, optimize marketing budgets, and enhance customer engagement. Future improvements could include real-time segmentation, integration with external data sources, and predictive customer lifetime value.