



## Project Title:

### Optimizing Retail Banking Strategies Through RFM-Based Customer Segmentation

## Project Overview:

In this project, you will work through customer transaction data to perform **RFM (Recency, Frequency, Monetary) analysis**.

The objective is to segment customers based on their behavior and develop targeted strategies to reduce churn, improve personalization, and optimize marketing efficiency at **BankTrust**.

Additionally, you are required to complete the Optimizing Retail Banking Strategies Through RFM-Based Customer Segmentation project available on the Amdari Website.

Project details can be found here:

[Amdari](#)

Follow the provided video solutions and re-create your submission notebook implementing the project enhancement accordingly..

## PROJECT 1: DELIVERABLES

- Set up version control using **Git** and **GitHub**.
- Complete a full RFM-based customer segmentation project.

- Deploy your final project using **Streamlit** to create an interactive dashboard.

## Tools:

- Terminal, Git, VS Code, Jupyter Notebook
- Python
- Libraries: `numpy`, `pandas`, `matplotlib`, `seaborn`, `scikit-learn`, `streamlit`

## Step-by-Step Workflow:

### 1. Data Collection and Preparation

- **Collect Transaction Data:** Work with customer banking transaction records.
- **Clean the Data:** Handle missing values, fix data types (e.g., dates), remove duplicates.
- **Feature Preparation:**
  - Calculate **Recency**: Days since last transaction.
  - Calculate **Frequency**: Number of transactions.
  - Calculate **Monetary**: Total value of transactions.

## 2. RFM Analysis and Feature Engineering

- **Assign RFM Scores:**

- Score customers on Recency, Frequency, and Monetary using quantiles.

- **Create RFM Segments:**

- Combine RFM scores into meaningful segments (e.g., Best Customers, At Risk, etc.).

- **Advanced Feature Engineering (optional):**

- Create age groups using `CustomerDOB`.
- Analyze transaction patterns by gender (`CustGender`) or location (`CustLocation`).

## 3. Modeling with Unsupervised Learning

- **Model Building:**

- Apply **KMeans Clustering** on the RFM features.
- Determine the optimal number of clusters (use Elbow Method or Silhouette Score).

- **Customer Segmentation:**

- Assign cluster labels to customers and interpret the profiles.

## 4. Model Evaluation

- **Evaluate Clusters:**

- Analyze the cluster quality.
- Summarize each customer segment (average RFM values, customer counts, etc.).

- **Business Interpretation:**

- Translate clusters into actionable marketing strategies.

## 5. Deployment and Dashboard (Enhancement)

- **Create a Streamlit App:**

- Display RFM Segmentation results and visualizations.
- Allow users to interactively filter customer segments.
- Provide simulation options like "what-if" scenarios (e.g., increase engagement among low-frequency customers).

- **Deploy your Streamlit App:**

- Use **Streamlit Cloud** for hosting.

## Duration

- **Submission Deadline:**  
**Monday, 12th May 2025, 12:59 PM WAT**

## Resources:

- [Version control using Git](#)
- Model deployment on Streamlit
- RFM Segmentation tutorial

## Data Fields:

Field	Description
TransactionID	Unique transaction ID
CustomerID	Unique customer ID
CustomerDOB	Date of birth

CustGender	Customer gender
CustLocation	Customer location
CustAccountBalance	Current account balance
TransactionDate	Date of transaction
TransactionTime	Timestamp of transaction
TransactionAmount	Value of transaction

## Aim of Project:

- Segment customers to **enhance marketing efficiency**.
- **Reduce churn** by identifying at-risk customers early.
- Personalize offers and communications based on customer profiles.
- Develop a **dashboard tool** for BankTrust teams to use for real-time customer insights.

✓ **All links** and **support resources** for setting up Git, Python libraries, Streamlit, and other tools will be made available in your Google Classroom.