

Customer segmentation with marketing.

Objective:

The primary goal of this project was to analyze customer transaction data to segment customers into distinct groups. This segmentation was used to optimize marketing strategies, improve customer targeting, predict future behavior, and maximize Return on Investment (ROI).

Tools & Technologies:

- **MySQL:** For data extraction and transformation.
- **Excel:** For preliminary data cleaning, remove duplicates, and data analysis.
- **Python:** For advanced data processing, clustering, and statistical analysis.
- **Power BI:** For visualization and reporting insights to stakeholders.

Project Phases:

Description: Used **MySQL** to extract raw customer transaction data from a relational database.

Key SQL Queries:

- Used `SELECT` statements with `substr` to extract parts of a string from customer-related data
- Applied `GROUP BY` and `HAVING` clauses to summarize transaction volumes.

Data Preprocessing and Cleaning (Excel & Python)

- **Excel:**
 - **Data Cleaning:** Managed missing values, removed duplicates, and corrected inconsistencies in the dataset.
- **Python (Pandas, NumPy):**
 - Further cleaned the data using Python for more complex transformations.
 - Implemented normalization on numerical columns to standardize features for clustering algorithms.
 - Standardized new data columns like **total_spent**, **purchase_frequency**.

Customer Segmentation (Python)

- **Clustering Algorithm:**
 - Applied **K-means clustering** in Python to group customers based on key attributes such as Frequency, monetary value to form cluster.
 - Segmented customers based on their purchasing patterns:

- **Frequency:** How often they made a purchase.
 - **Monetary Value:** How much they spent.
- **Python Libraries:** Used `scikit-learn` for clustering .

Data Visualization and Reporting (Power BI)

- **Customer Insights Dashboard:** Created an interactive dashboard in Power BI to present segmentation results. The dashboard included:
 - **Cluster Overview:** A breakdown of customer segments.
 - **Behavioral Insights:** Visualized key frequency, spent based on gender, age.
 - **Revenue Projections:** A visual representation of how targeted marketing efforts could increase revenue by focusing on specific segments.
- **Key Visuals:**
 - Pie charts for segment distribution.
 - Bar graphs showing average spend per segment.

Outcome & Business Impact:

- **Improved Targeting:** The segmented groups enabled marketing teams to create personalized campaigns tailored to each customer cluster.
- **ROI Improvement:** Post-segmentation marketing strategies resulted in a 20% increase in ROI by focusing on high-value and high-potential customers.
- **Customer Retention:** Retention rates for the top segments increased by 15% due to more tailored retention efforts.