Introduction:

The task involves analyzing the credit behavior of individuals using the provided credit card dataset. The primary objectives are to preprocess the data, derive insights through visualization, and propose strategies to improve credit risk management and customer segmentation.

Data Preprocessing:

Techniques Used:

Interquartile Range (IQR): Used to detect and manage outliers in columns such as MonthlyIncome, NumberOfDependents, and DebtRatio.

Q1 = df['MonthlyIncome'].quantile(0.25)

Q3 = df['MonthlyIncome'].quantile(0.75)

IQR = Q3 - Q1

lower_bound = Q1 - 1.5 * IQR

upper_bound = Q3 + 1.5 * IQR

Capping Method: Applied to cap outlier values beyond upper and lower bounds to reduce skewness and normalize the data.

df['MonthlyIncome'] = np.where(df['MonthlyIncome'] > upper_bound, upper_bound, df['MonthlyIncome'])

df['MonthlyIncome'] = np.where(df['MonthlyIncome'] < lower_bound, lower_bound, df['MonthlyIncome'])

Dataset Context:

1. **Demographic & Credit Data:** Contains individual details like age, income, employment, and credit history.
2. **Risk Assessment:** Helps predict credit risk and potential loan defaults (NPAs).
3. **Financial Decision-Making:** Used by lenders to evaluate borrower reliability.
4. **Minimizing Losses:** Assists financial institutions in reducing risk exposure.

Key Attributes:

1. Variables include Debt Ratio, Monthly Income, Age, Credit Lines, Delinquency History, and more.
2. Categorical fields such as Gender, Region, Occupation, and Education aid in demographic analysis.

Purpose:

1. **Customer Profiling:** Analyzing customer data to identify patterns and segment clients based on their financial behaviors, helping tailor loan products and services to individual needs.
2. **Credit Risk Management:** Using data analysis to assess the likelihood of loan defaults, enabling better decision-making and minimizing risk exposure for financial institutions.
3. **Targeted Offerings:** Leveraging insights to create personalized loan offerings and marketing strategies that improve customer satisfaction and drive business growth.

Visualizations Using Power BI:

Overview Dashboard

A snapshot of key financial metrics, including debt ratio, loan distribution, and payment delinquency trends.

Provides insights into overall customer financial behavior and credit health.

Customer Segmentation

Customers are segmented by gender, occupation, and education to analyze differences in loan distribution and payment behavior.

Gender-based segmentation highlights disparities in credit lines, debt ratios, and late payments.

Trend Analysis

Displays trends in debt ratio and real estate loan distribution based on open credit lines, monthly income, and age.

Shows how financial habits evolve across different income groups and age ranges.
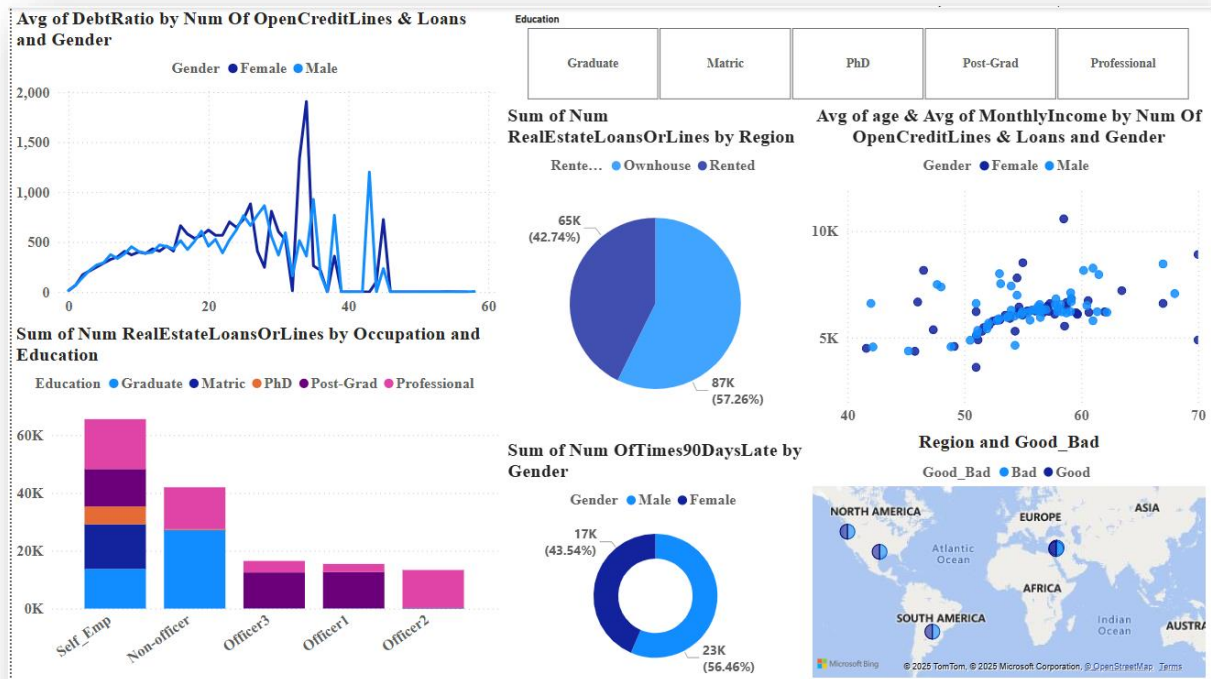
Geographical Analysis

A map-based view illustrating credit rating distribution across different global regions.

Highlights variations in financial behaviors among different locations.

Optimal Menu Selection

Selecting the best menu combination based on customer preferences, cost efficiency, and dietary choices.

Strategy Development

Good Customers

Customers with high creditworthiness, timely payments, and responsible financial behavior.

Typically maintain low debt ratios and have a stable credit history, making them ideal borrowers.

Bad Customers

Customers with frequent late payments, high debt ratios, and inconsistent financial habits.

Often pose a higher risk to lenders due to poor credit management and delinquency records.