**📊 Data Analysis Report:**

**How Does Credit Card Spending Vary by Income Group or Age?**

**📌 Objective:**

To explore how **credit card spending behavior (using Avg\_Utilization\_Ratio as a proxy)** differs across **Income\_Category** and **Age\_Group** using the *Credit Card Customers* dataset.

**📌 Data Preparation:**

**Steps Taken:**

* Removed duplicates using SELECT DISTINCT
* Checked for and handled null values in Customer\_Age, Income\_Category, and Avg\_Utilization\_Ratio
* Created age groups using a CASE WHEN statement:
  + 20–30
  + 31–40
  + 41–50
  + 51–60
  + 61+
* Grouped data by **Income\_Category** and **Age\_Group**
* Calculated the average of **Avg\_Utilization\_Ratio** for each group

**📌 Data Analysis & Visualization:**

**Tool Used:**

* Data cleaned and grouped in SQL
* Exported results to .csv
* Visualized in **R** using ggplot2 bar charts

**📌 Key Insights:**

1️⃣ **Higher utilization among lower-income, older customers:**

* Customers aged **61+** with **Less than $40K income** showed the highest average credit utilization.

2️⃣ **Age 51–60 group showed consistently higher utilization** across all income categories compared to younger age groups.

3️⃣ **Age 41–50 group consistently showed lower average utilization** than other age groups.

4️⃣ **Inverse relationship between income and utilization:**

* As **Income\_Category increases**, **Avg\_Utilization\_Ratio decreases** — indicating higher-income groups rely less on their credit limit.

5️⃣ **Notable outlier:**

* **60+ year-olds in Less than $40K category** had even higher average utilization than younger, lower-income groups — a surprising and important finding.

**📌 Interpretation:**

These results suggest:

* **Lower-income, older customers may depend more heavily on credit cards** — possibly due to fixed incomes or higher medical/living costs.
* **Higher-income customers use less of their credit limit** — likely having more disposable income or better financial security.

**📌 Next Steps / Recommendations:**

* Investigate reasons behind high credit utilization in the **51–60 and 61+ groups**.
* Explore other factors like **Education\_Level** or **Marital\_Status** in a future analysis.
* Consider offering **financial literacy programs or credit management resources** to higher-risk groups.

