Credit Card Transactions Analysis - Summary Report

Introduction:

This analysis investigates **credit card transaction patterns**, detecting anomalies, identifying customer spending behaviours, and providing insights into potentially fraudulent activities. The dataset consists of **5,500 transactions** with details on transaction types, merchants, categories, amounts, payment modes, and customer demographics.

Data Cleaning and Preprocessing

- **No missing values** were found in essential columns after checking.

- The Amount column had missing values, which were filled with the **median transaction amount**.

- Additional date-related features (Year, Month, Day) were extracted from Transaction_Date.

- Transactions were **categorized into Low, Medium, and High-value bands** based on amount thresholds.

Key Insights and Analysis

1. **Transaction Trends:**

   - The **highest spending category** was **Dining ($2,402,259.10)**, followed by **Groceries ($2,386,772.81)**.

   - **Travel and Clothing had the lowest total transaction amounts** ($2,168,822.96 and $2,185,530.09, respectively).

   - **No transactions were recorded in January 2024**, indicating possible missing or incorrect data.

2. **Merchant Insights:**

   - The **top five merchants** by transaction count were **Uber (833), Walmart (818), BestBuy (790), Netflix (774), and Amazon (770).**

   - These findings highlight frequent usage of **ride-hailing services, online shopping, and entertainment subscriptions**.

3. **Declined Transactions:**

   - The **most declined payment mode** was **Debit Card (145 declines)**, followed by **PayPal (135)** and **UPI (134)**.

- o Understanding these declines can help improve **customer payment success rates**.

4. **Fraud Detection Indicators:**

   - o **No customers made more than 10 transactions in a single day**, reducing concerns about unusual spending spikes.

   - o **No high-risk online transactions (Amount > $5000) were detected**, suggesting low fraud exposure in large online purchases.

   - o The **average transaction amount per age group** revealed **46-60-year-olds had the highest spending ($2,978.27)**, while **31-45-year-olds had the lowest ($2,785.66)**.

5. **Location-Based Spending Patterns:**

   - o The **highest average transaction amount** was in **Abigailfort ($3,634.88)**, whereas **Aaronside had the lowest ($315.54)**.

   - o **Variations in spending behaviour across locations** suggest different consumer purchasing power.

Conclusion

This analysis provides valuable insights into **spending trends, merchant popularity, payment behaviour, and fraud detection**. Financial institutions can use these insights to:

- **Optimize fraud detection strategies** by focusing on high-risk categories.

- **Enhance customer experience** by reducing payment failures.

- **Target marketing efforts** based on customer spending behaviours and locations.

Future improvements could include **time-series analysis for seasonal trends** and **predictive modelling for fraud detection**.