SYNTHETIC FINANCIAL

DATA ANALYSIS

BY: GROWTH GURUS

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Hello,

Meet Our Team

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Problem Statement

What insights can a synthetic financial dataset provide to identify informative features for fraud detection, and how can we use it to evaluate methods for achieving high accuracy?

4 NATURE OF DATASET

- Synthetic financial dataset is artificially generated data that mimics real transactions.

- This dataset contains historical records of financial activity potentially including fraudulent ones that occurred on January 1st, 2023 from 12:00 AM to 2:00 AM.

It includes details about

Transactions (ID, time, is fraudulent)

Customers (age, ID) & Merchants(ID)

Context (card type, location, purchase category)

OBJECTIVES

01 Segmenting customers by behavior, demographics, and preferences.

02 Analyzing customer segments to understand behavior and preferences.

03 Investigating correlations between customer segments and variables like fraud rates or transaction amounts.

04 Conducting customer segmentation analysis to categorize customers into groups based on demographics, transaction frequency, and purchase categories.

APPROACH

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DATA PREPARATION

Preprocessed and standardized synthetic financial transaction data to ensure consistency and reliability in subsequent analyses.

2

EXPLORATORY ANALYSIS

To uncover patterns and relationships within the synthetic financial dataset, informing subsequent analytical approaches

3

DIAGNOSTIC ANALYSIS

Identifying anomalies,outliers in transaction data, aiding fraud detection and ensuring data quality for accurate analysis.

4

PREDICTIVE ANALYSIS

Forecast transaction amounts and enhance fraud detection in the financial dataset.

5

ACTIONABLE INSIGHTS

Derived actionable insights from the analysis to optimize fraud detection mechanisms and inform targeted marketing strategies, enhancing operational efficiency and customer satisfaction.

INSIGHTS

VISUALIZATION TECHNIQUES

BAR GRAPH

Facilitated comparison of transaction amount distributions across categories, aiding trend identification.

PIE CHART

Clarified the proportion of fraudulent transactions, enhancing understanding of fraud incidence rates and patterns.tes and patterns.

DONUT CHART

Offered insight into spending patterns by presenting transaction category breakdown.

HEATMAPS

Explored correlations like merchant category vs. hour, unveiling potential patterns.

HISTOGRAMS

Visualized transaction frequency over time, revealing peak periods and activity fluctuations.

INSIGHTS

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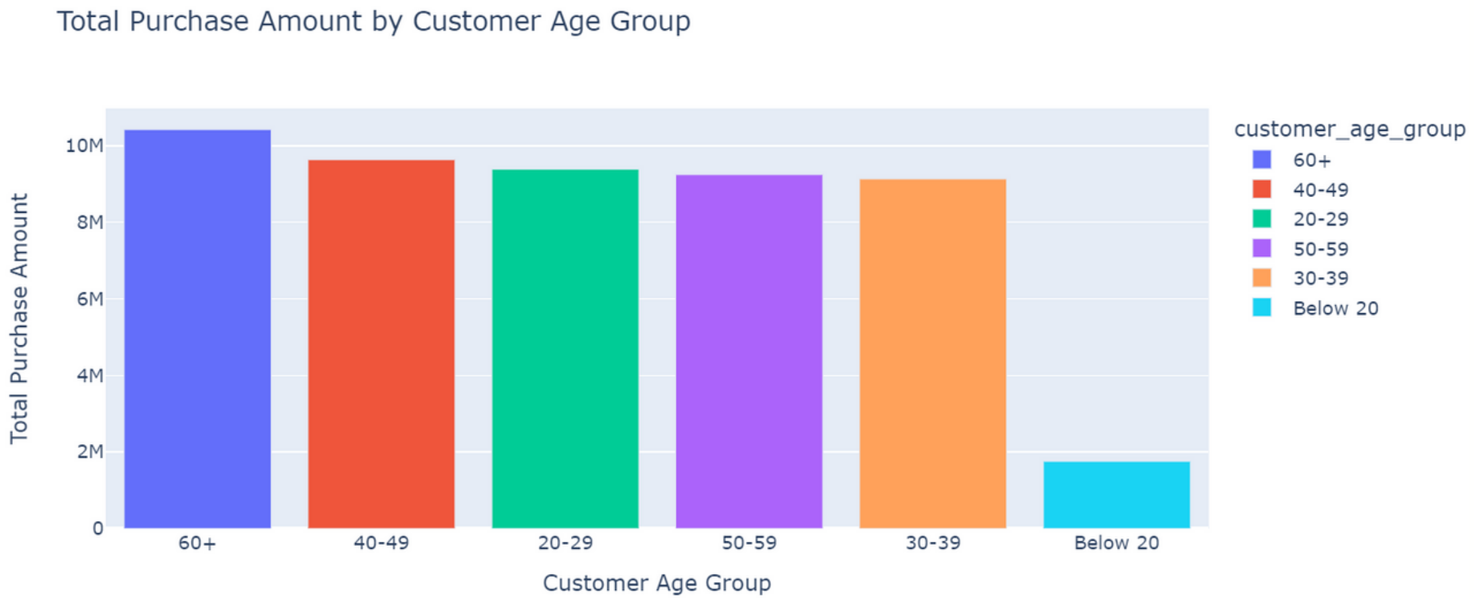
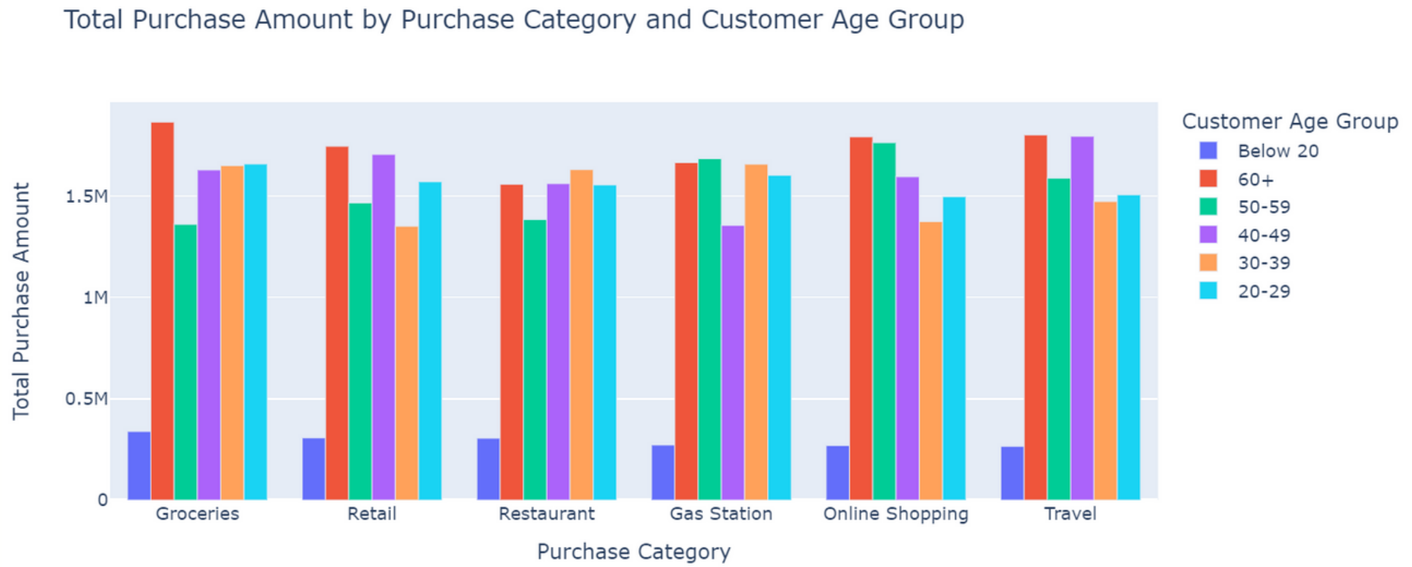
- Transaction amounts vary widely, indicating diverse spending behaviors among customers.
- Certain merchants or transaction types exhibit irregular patterns, warranting further investigation for fraud detection purposes.
- Analysis of customer behaviors, including preferred card types and frequently chosen purchase categories.
- Unveiling correlations between customer age, spending, and fraud occurrence, highlighting targeted transaction types and vulnerable demographics.
- Exploration of spatial patterns in card types and fraud occurrences, pinpointing the most targeted cards and the demographics most affected by attacks.

INFERENCES

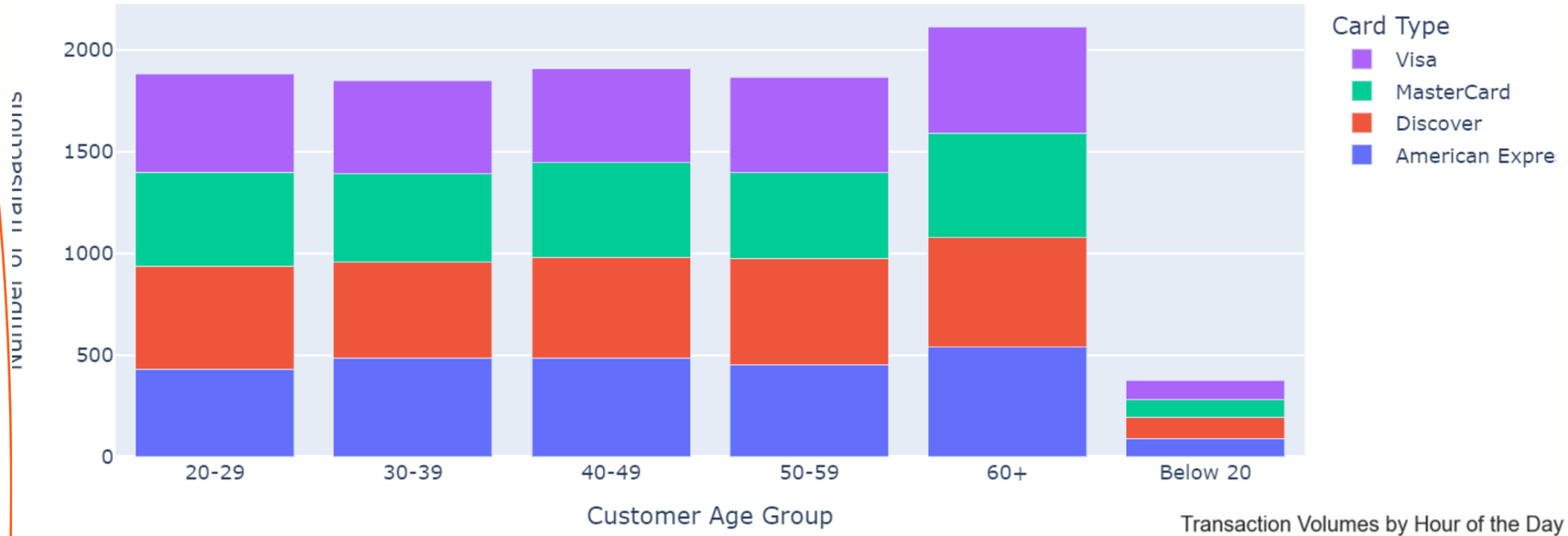
Transaction amounts vary widely, indicating diverse spending behaviors among customers.

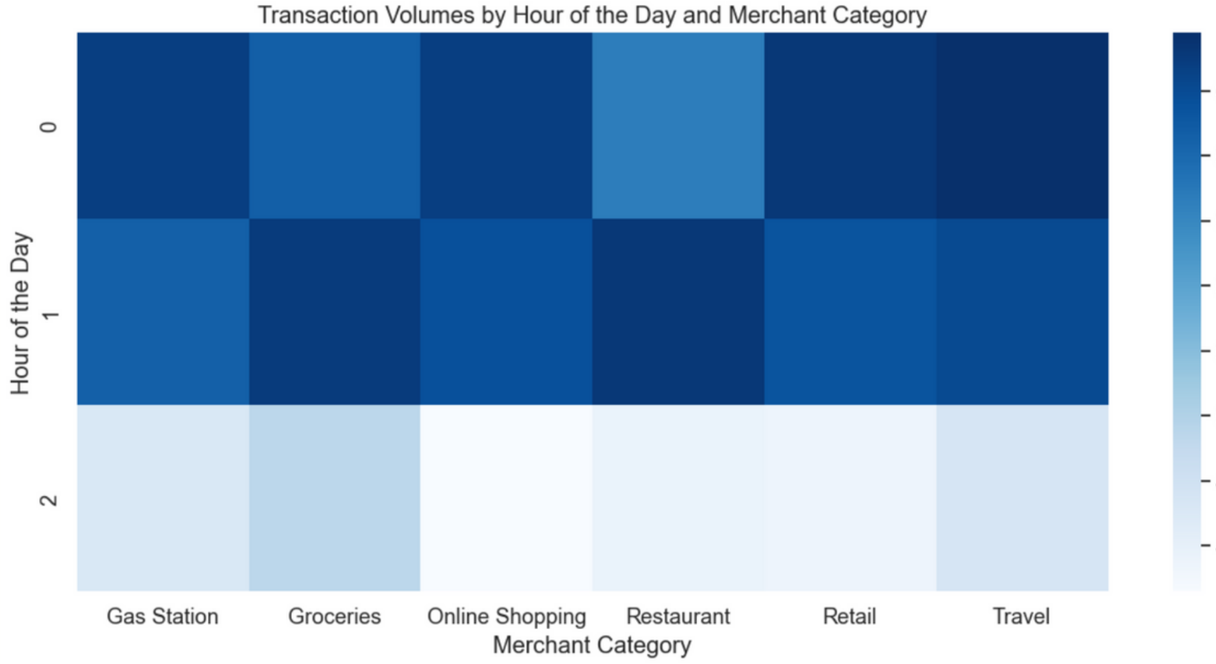




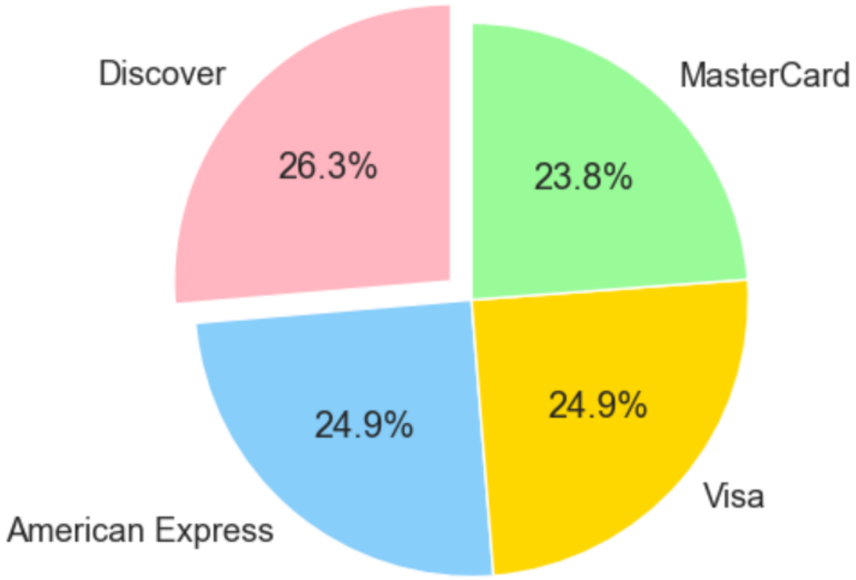
Analysis of customer behaviors, including preferred card types and frequently chosen purchase categories.

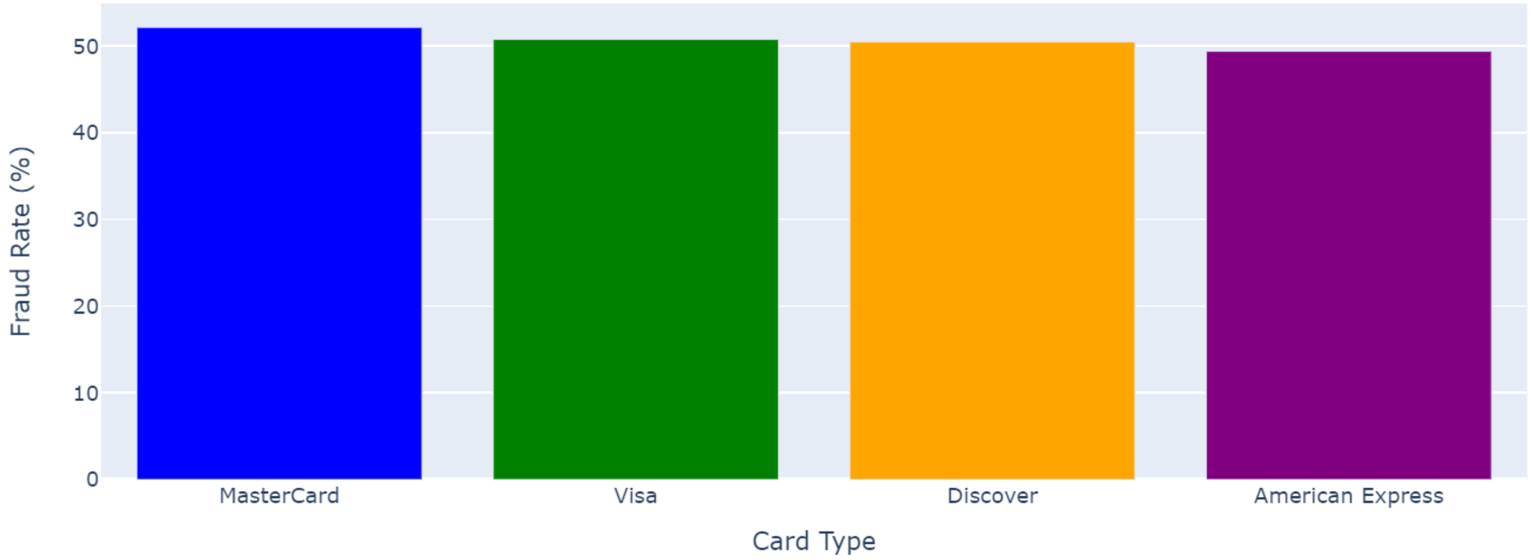
Distribution of Card Usage by Card Type and Age Group





Exploration of spatial patterns in card types and fraud occurrences, pinpointing the most targeted cards and the demographics most affected by attacks.





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CHALLENGES

Transaction time analysis

Network Analysis

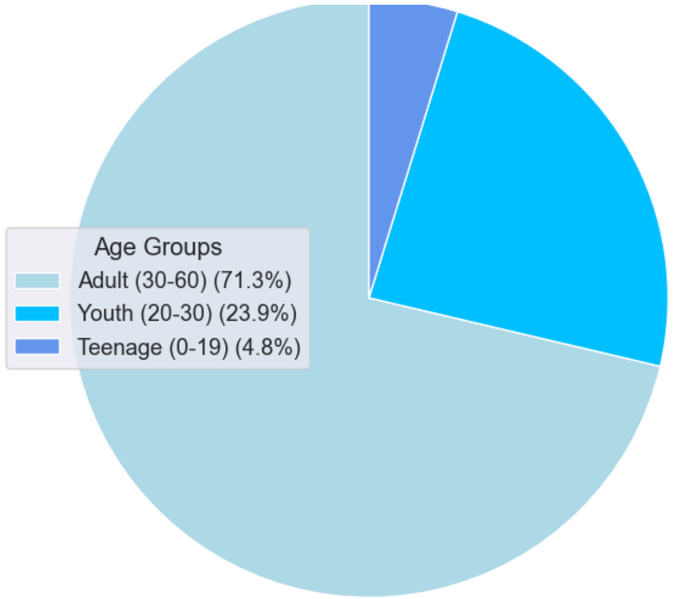
Data Visualization

Data Volume

Predictive Analysis

BUSINESS PERSPECTIVE

01



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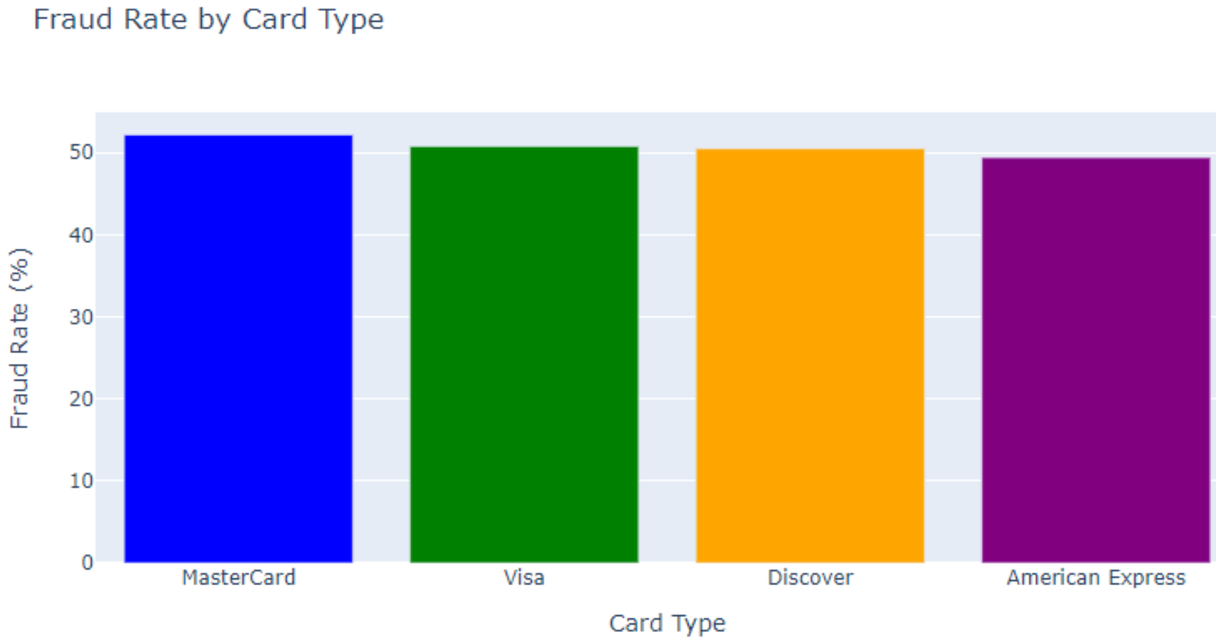

BUSINESS PERSPECTIVE

03

BUSINESS PERSPECTIVE

- **Age-Linked Spending Trends:** Understanding the Rise in Spending with Age
- **Retail and Grocery Dominance:** Key Spending Patterns Across Generations
- **Tailoring Businesses for Seniors:** Optimizing Customer Experiences for Older Demographics
- **Commercial Hotspots:** Identifying High-Activity Locations for Strategic Business Decisions
- **Payment Trends:** Leveraging Visa and Mastercard for Enhanced Fraud Detection

PREDICTIONS

The anticipated trends or future developments in fraud prevention and fraudulent activities within the realm of financial transactions and card usage.

Fraud Prevention Software

Increased Fraud Prevention Measures for High-Risk Card Types

Rise of Visa Card Fraud as a Service (FaaS):

Fraudsters offer online tools for Visa card fraud, facilitating unauthorized transactions.

Rise of Account Takeover (ATO) Fraud

Involves criminals gaining unauthorized access to user accounts due to increasing population.

THANK YOU