Anomaly Detection in Credit Card Transactions

Distribution of Transaction Amounts

TotalTransactions vs type

- CASH_OUT: 41415M
- TRANSFER: 34814M
- CASH_IN: 23495M
- PAYMENT: 2412M
- DEBIT: 29M

Transaction amount over time (step)

type
- CASH_IN
- CASH_OUT
- DEBIT
- PAYMENT
- TRANSFER
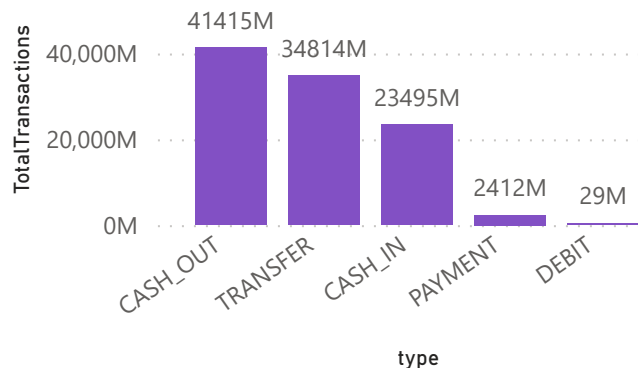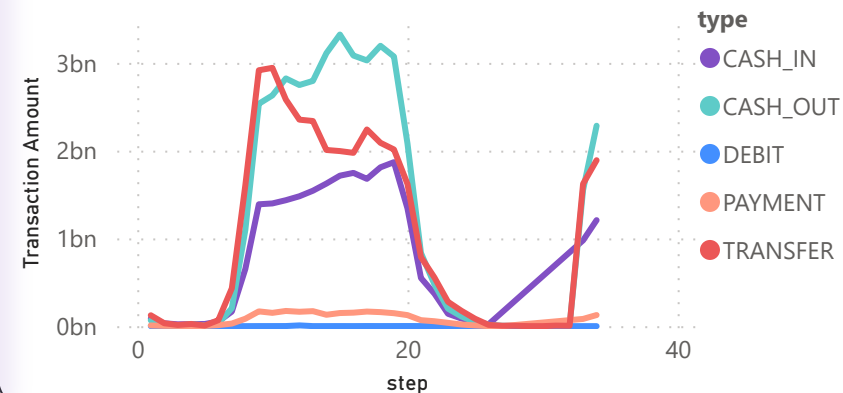
161.5K	630.9K	10.0M	-3.6M
Average Normal Transaction	Total Credit Card Transactions	Highest Fraud Transaction Amount	Diff_btw_max_normal&max_fraud_trans_...

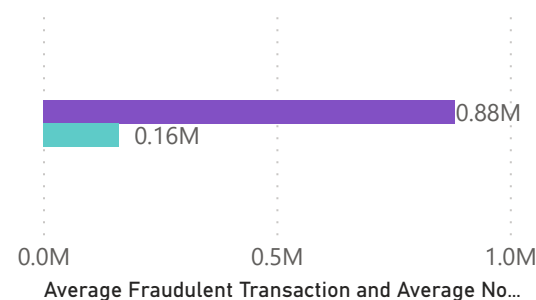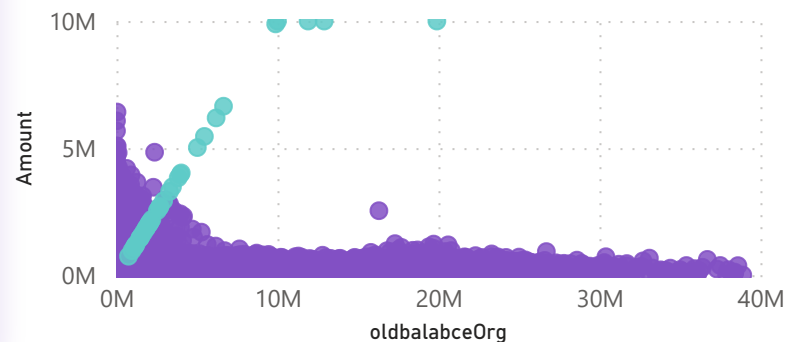| 881.6K	383	6.4M	0.06%
Average Fraudulent Transaction	Total Fraudulent Credit Card Transactions	Highest Normal Transaction Amount	Percentage Fraudulent Transaction

AvgFraudTransaction vs AvgNormalTransaction

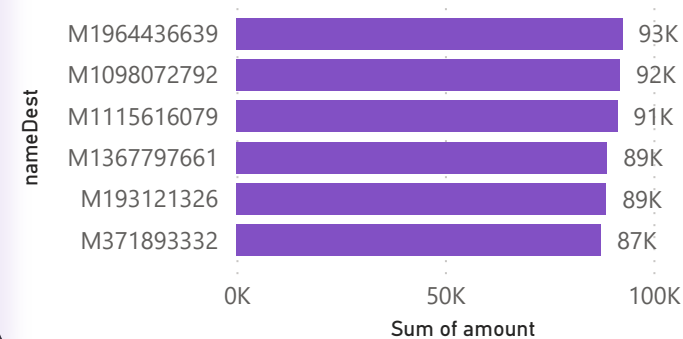- Average Fraudulent Tra...
- Average Normal ...
- 0.88M
- 0.16M

Average Fraudulent Transaction and Average No...

Realationship btw oldbalanceOrg and amount

isFraud: ● 0 ● 1

Top 10 Merchant with highest Transaction Counts

nameDest	Sum of amount
M1964436639	93K
M1098072792	92K
M1115616079	91K
M1367797661	89K
M193121326	89K
M371893332	87K

step
1 — 34

isFraud
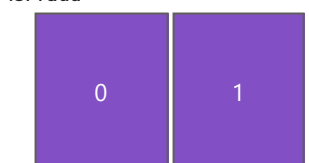| 0 | 1 |

Table for Top 10 Merchants (Starts with 'm'):
Setup:
  • Fields: 'dest' (merchant names), Sum of amounts (total transaction amounts).
Filtering:
  • Advanced Filtering: Name (dest) starts with 'm', Top 10.
Explanation:
Field Selection:
        'dest' for merchant names, Sum of amounts for total transaction amounts.
Advanced Filtering:
        Focus on merchants starting with 'm', emphasizing specificity.
Top N Selection:
        Highlight the Top 10 merchants based on total transaction amounts.
Interpretation:
        Provides a concise view of the highest-contributing merchants.
Use Cases:
        Useful for quick identification and comparison of top merchants.
Further Analysis:
        Enables targeted exploration of transaction patterns for specific merchants.

Table for Merchants with High Occurrence of Fraudulent Transactions:
Setup:
  • Fields: 'dest' (merchant names), Sum of amounts (total transaction amounts), 'isFraud' (fraud indicator).
Filtering:
  • Advanced Filtering: Name (dest) starts with 'm', 'isFraud' equals 1 (fraudulent transactions).
Explanation:
Field Selection:
        'dest' for merchant names, Sum of amounts for total transaction amounts, 'isFraud' for
        indicating fraudulent transactions.
Advanced Filtering:
        Conditions set for merchants starting with 'm' and having 'isFraud' equal to 1.
Interpretation:
        No output indicates no merchants starting with 'm' have a high occurrence of fraudulent
        transactions based on the specified criteria.
Possible Reasons:
        Data might not contain merchants meeting the criteria or may need further review of filtering
        conditions.

Scatter Plot (Relationship between oldbalanceOrg vs. amount):
Purpose:
  • Explore the relationship between 'oldbalanceOrg' (originalbalance) and 'amount'
    (transaction amount).

Why this visualization:
  • Useful for visualizing the distribution and relationship between two continuous
    variables.
  • Identifies patterns, clusters, and outliers.
  • In financial transactions, reveals insights into spending patterns or anomalies.

Interpretation:
  • Points clustered in regions indicate common transaction behaviors.
  • Outliers or patterns may suggest fraudulent activities or abnormal transactions.

Line Chart (Transaction Amount Over Time (step)):
Purpose:
  • The line chart aims to illustrate the trends in transaction amounts over time
    (represented by 'step').

Why this visualization:
  • Line charts are suitable for visualizing trends and patterns over a continuous
    variable, such as time.
  • It helps in identifying unusual spikes or drops in transaction amounts, which
    might be indicative of irregular activities.

Interpretation:
  • Sudden spikes or drops in the line may represent abnormal transaction behavior.
  • Consistent trends can indicate regular transaction patterns over time.