

In [2]:

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import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns

# Generating synthetic banking transactions data
np.random.seed(42)
num_transactions = 1000
transaction_ids = np.arange(1, num_transactions + 1)
dates = pd.date_range(start='2022-01-01', end='2022-12-31', periods=num_transactions)
amounts = np.random.normal(loc=1000, scale=500, size=num_transactions)
transaction_types = np.random.choice(['Credit', 'Debit'], size=num_transactions)
account_types = np.random.choice(['Savings', 'Checking'], size=num_transactions)

# Creating DataFrame
transactions_df = pd.DataFrame({
    'Transaction_ID': transaction_ids,
    'Date': dates,
    'Amount': amounts,
    'Transaction_Type': transaction_types,
    'Account_Type': account_types
})

# Displaying first few rows of the DataFrame
print(transactions_df.head())

# Summary statistics
print(transactions_df.describe())

# Data visualization
# Histogram of Amount
plt.figure(figsize=(10, 6))
sns.histplot(transactions_df['Amount'], bins=20, kde=True)
plt.title('Distribution of Transaction Amount')
plt.xlabel('Amount')
plt.ylabel('Frequency')
plt.show()

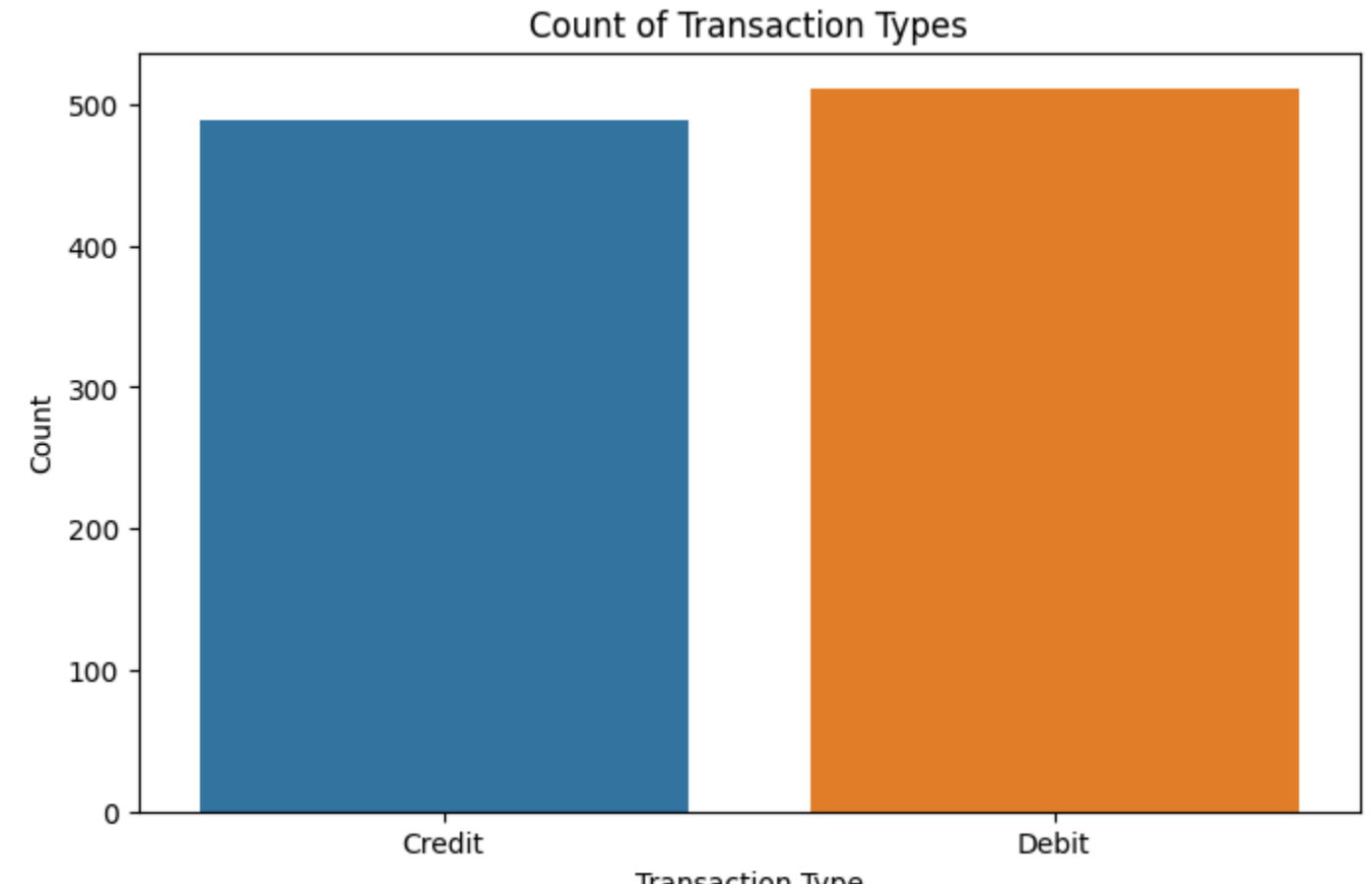
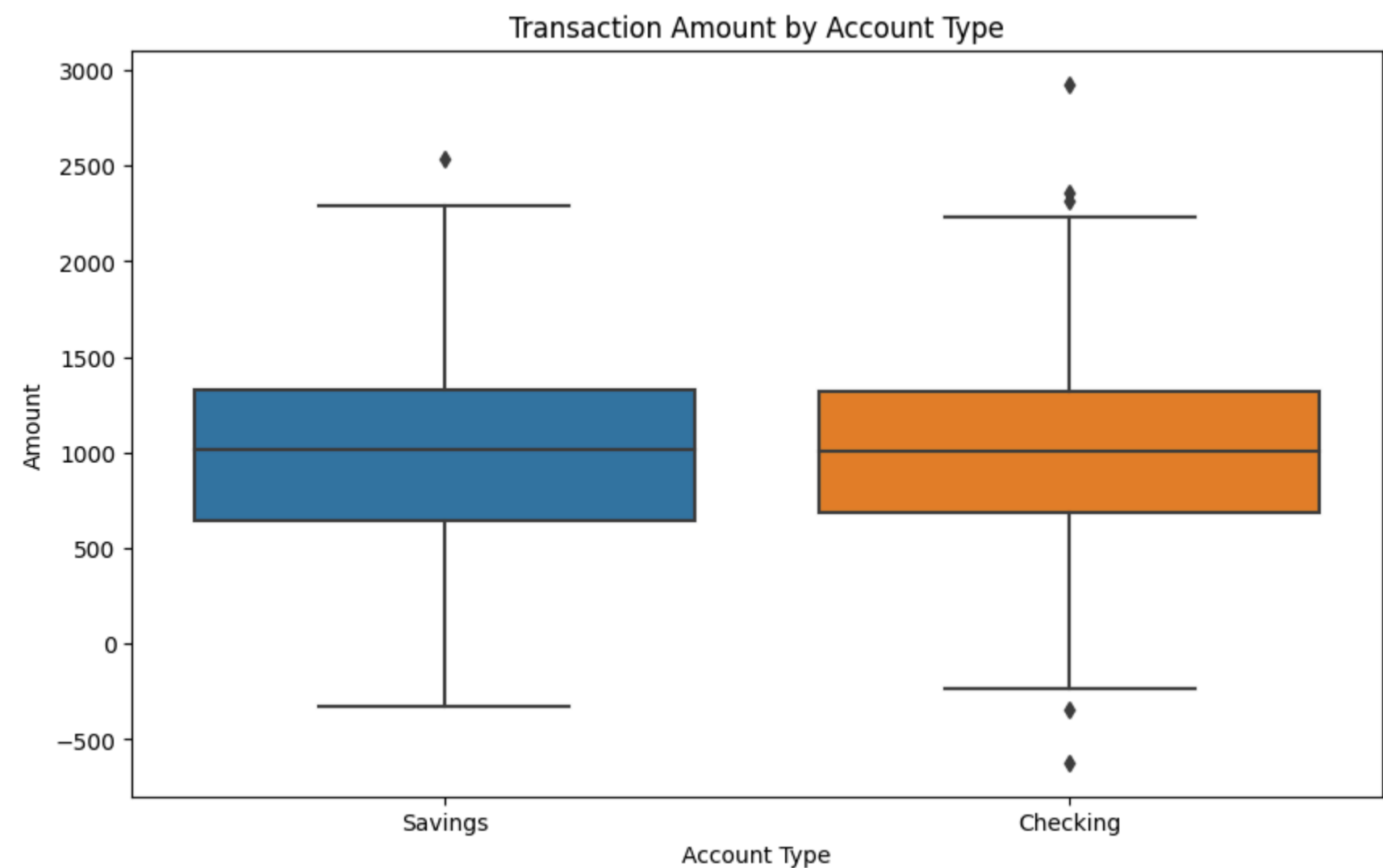
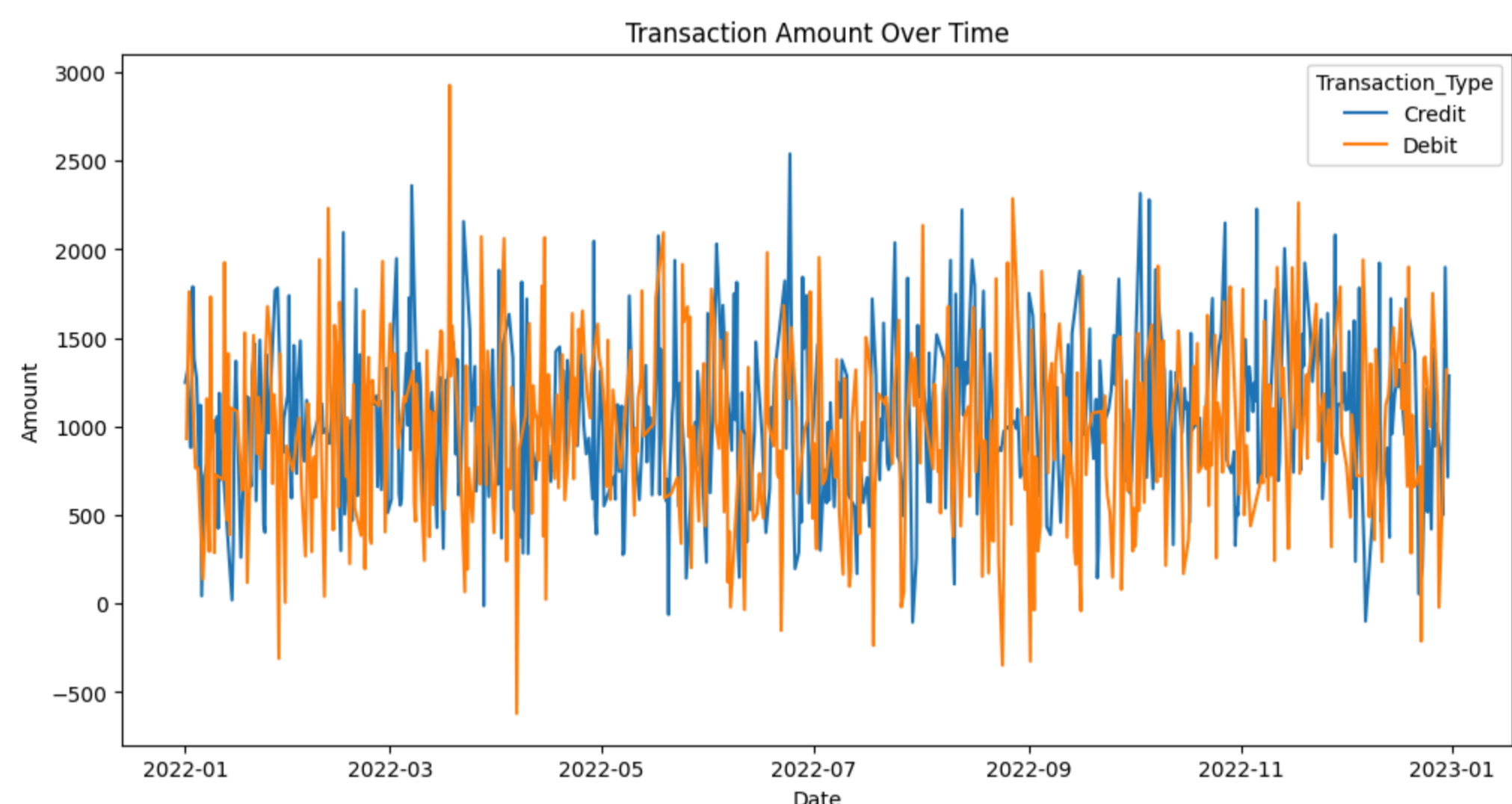
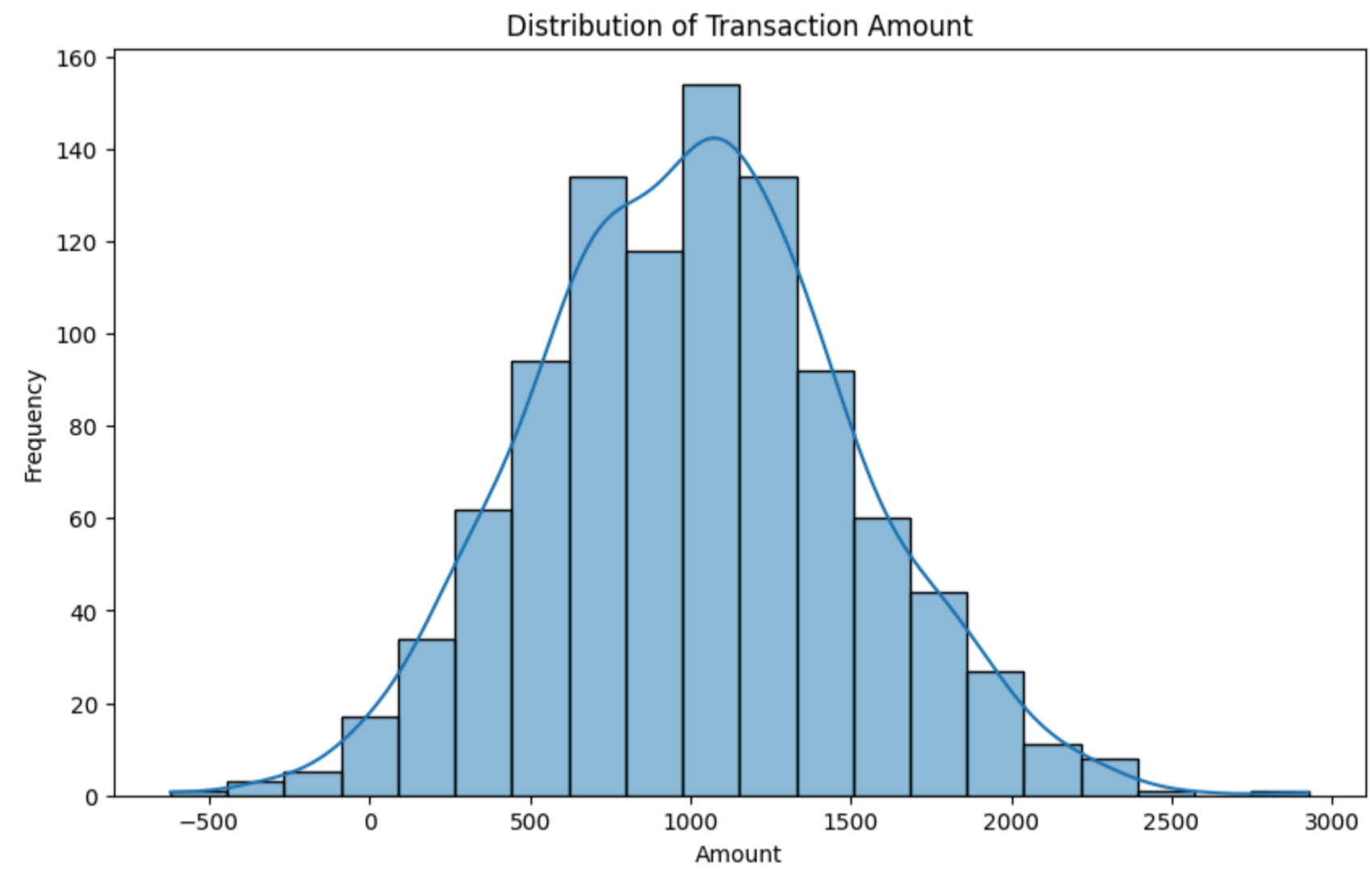
# Line plot of Amount over time
plt.figure(figsize=(12, 6))
sns.lineplot(x='Date', y='Amount', data=transactions_df, hue='Transaction_Type')
plt.title('Transaction Amount Over Time')
plt.xlabel('Date')
plt.ylabel('Amount')
plt.show()

# Boxplot of Amount by Account Type
plt.figure(figsize=(10, 6))
sns.boxplot(x='Account_Type', y='Amount', data=transactions_df)
plt.title('Transaction Amount by Account Type')
plt.xlabel('Account Type')
plt.ylabel('Amount')
plt.show()

# Count plot of Transaction Type
plt.figure(figsize=(8, 5))
sns.countplot(x='Transaction_Type', data=transactions_df)
plt.title('Count of Transaction Types')
plt.xlabel('Transaction Type')
plt.ylabel('Count')
plt.show()
```

	Transaction_ID	Date	Amount	Transaction_Type
0	1	2022-01-01 00:00:00.000000000	1248.357077	Credit
1	2	2022-01-01 08:44:41.081081081	930.867849	Debit
2	3	2022-01-01 17:29:22.162162162	1323.844269	Credit
3	4	2022-01-02 02:14:03.243243243	1761.514928	Debit
4	5	2022-01-02 10:58:44.324324324	882.923313	Credit

	Account_Type	Transaction_ID	Amount
count	Savings	1000.000000	1000.000000
mean	Savings	500.500000	1009.666028
std	Savings	288.819436	489.607969
min	Savings	1.000000	-620.633670
25%	Savings	250.750000	676.204847
50%	Savings	500.500000	1012.650306
75%	Savings	750.250000	1323.971938
max	Checking	1000.000000	2926.365745



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