



BANK OF AMERICA

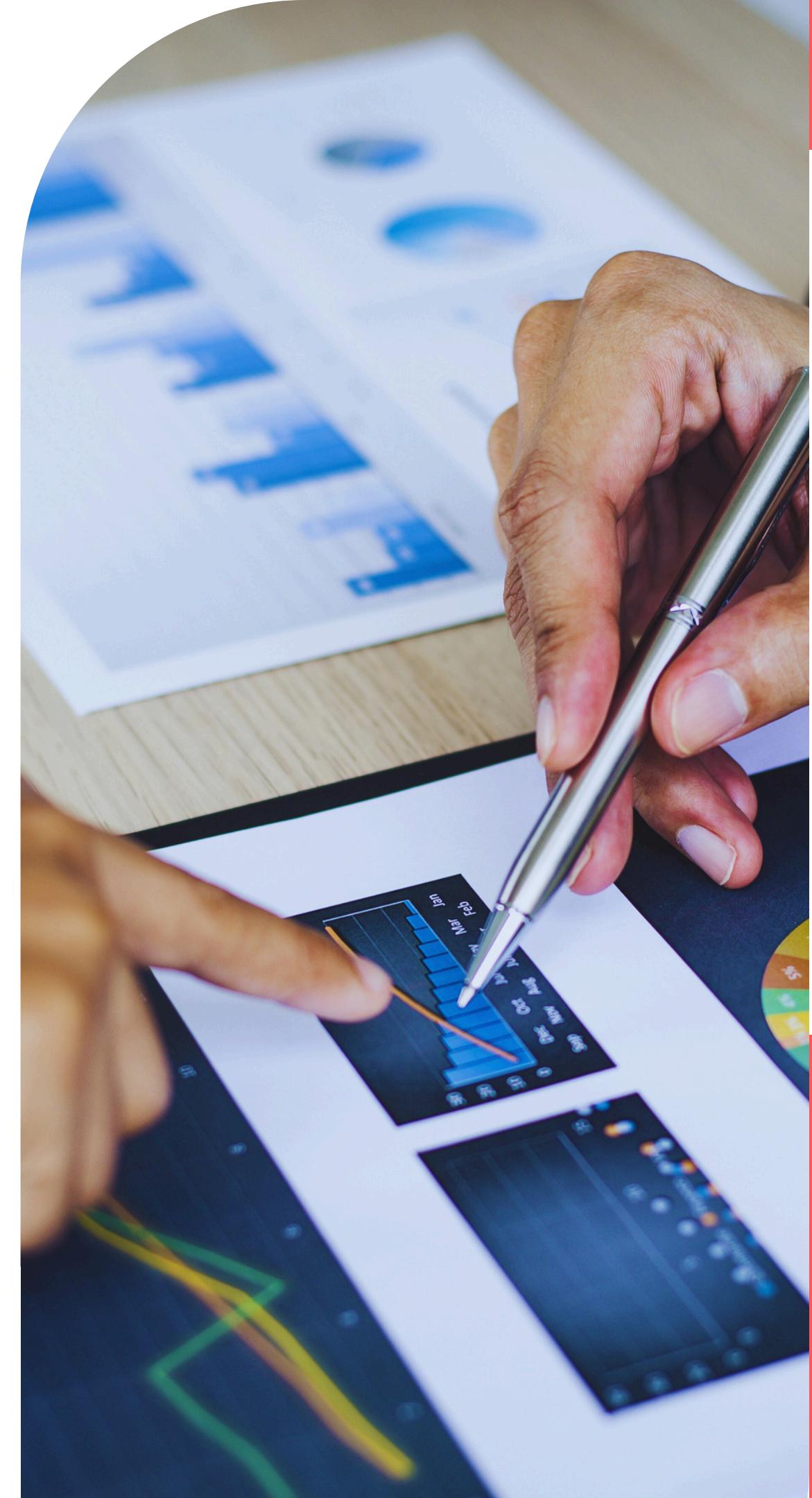
FINANCIAL INSIGHTS ANALYSIS FOR BANK OF AMERICA CREDIT CARD CUSTOMERS

Power BI Analysis using DAX

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AGENDA

- 01 Overview Of Analysis**
- 02 Key Metrics and Insights**
- 03 Finding using DAX**
- 04 Conclusion**





PROJECT OVERVIEW



This project analyzes Bank of America credit card data in Power BI to calculate key metrics like transaction amounts, credit limits, utilization ratios, and delinquency risks. The aim is to provide insights into customer behavior and financial performance for better retention and risk management.

01

Project Objective:

Analyze Bank of America credit card usage data using Power BI to calculate key financial metrics such as running totals, moving averages, growth rates, and KPIs. The goal is to assess customer behavior, credit utilization, and delinquency risk, providing insights for improving customer retention and overall financial performance.

02

Dataset:

Bank of America credit card usage data, including transaction amounts, credit limits, utilization ratios, delinquent accounts, and revolving balances.

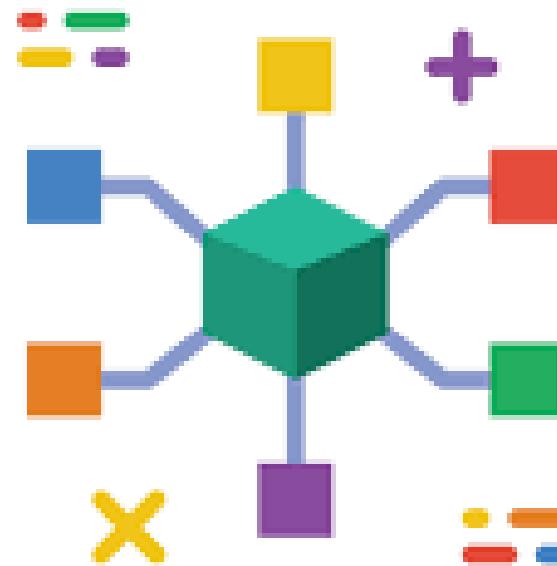


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METRIC: Cumulative sum of credit card transactions over time

DAX FORMULA:

```
cumulative_sum_trnsAmt = CALCULATE(SUM(credit_card[Total_Trans_Amt]),  
FILTER(all(credit_card),credit_card[Week_Start_Date]<=MAX(credit_card[Week_Start_Date])))
```

RESULT SET:

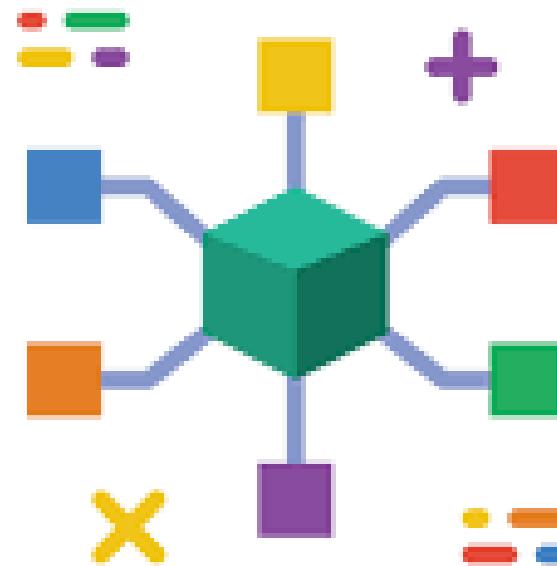
Week_Start_Date	Sum of Total_Trans_Amt	cumulative_sum_trnsAmt
01 January 2023	₹ 8,35,767	₹ 8,35,767
08 January 2023	₹ 8,44,739	₹ 16,80,506
15 January 2023	₹ 9,23,367	₹ 26,03,873
22 January 2023	₹ 8,69,235	₹ 34,73,108
29 January 2023	₹ 8,49,078	₹ 43,22,186
05 February 2023	₹ 8,98,867	₹ 52,21,053
12 February 2023	₹ 8,90,756	₹ 61,11,809
19 February 2023	₹ 8,68,091	₹ 69,79,900



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METRIC: 4-Week Moving Average of Credit Limit

DAX FORMULA:

```
moving_average =  
var windowof_4week=DATESINPERIOD(calendar_table[Date],max(calendar_table[Date]),-28,DAY)  
var total_cc_limit=CALCULATE(SUM(credit_card[Credit_Limit])),windowof_4week)  
var distinct_week=CALCULATE(DISTINCTCOUNT(calendar_table[week_number])),windowof_4week)  
  
return DIVIDE(total_cc_limit,distinct_week)
```

RESULT SET:

week_number	Sum of Credit_Limit	moving_average
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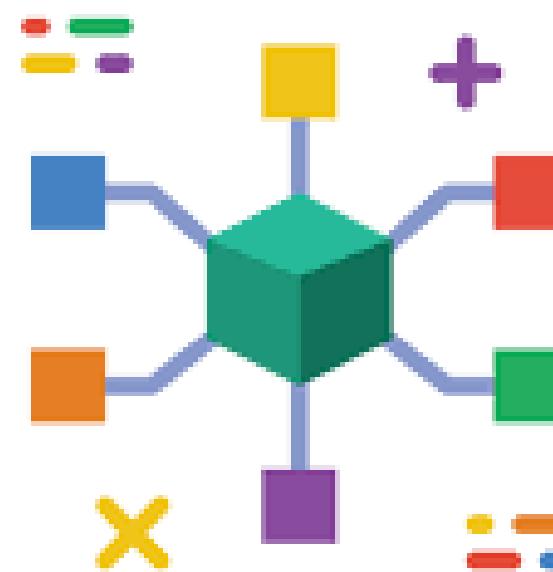
week_number	Sum of Credit_Limit	moving_average
1	₹ 17,04,635.7	1303110
2	₹ 16,00,959.7	1652798
3	₹ 15,26,415.1	1610670
4	₹ 16,47,543.2	1619888
5	₹ 17,98,645	1643391
6	₹ 17,10,629.7	1670808
7	₹ 19,76,267	1783271
8	₹ 17,33,164.8	1804677



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METRIC: Month-over-Month % Growth of Transaction Amount.

DAX FORMULA:

```
MOM_growth =  
var previous_month=CALCULATE(SUM(credit_card[Total_Trans_Amt]),  
DATEADD(calendar_table[Date],-1,MONTH))  
return DIVIDE(SUM(credit_card[Total_Trans_Amt])-previous_month,previous_month,0)
```

RESULT SET:

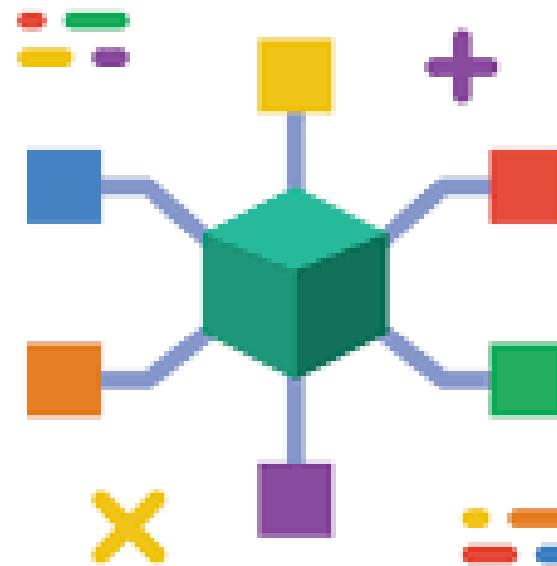
Month	Sum of Total_Trans_Amt	MOM_growth
January	₹ 43,22,186	▲ 1.91%
February	₹ 35,39,575	◆ -18.11%
March	₹ 33,88,827	▲ -4.26%
April	₹ 41,74,728	○ 23.19%
May	₹ 34,26,913	◆ -17.91%
June	₹ 35,33,660	▲ 3.11%
July	₹ 45,46,958	○ 28.68%
August	₹ 34,49,868	◆ -24.13%
September	₹ 34,52,874	▲ 0.09%
October	₹ 40,50,909	○ 17.32%
November	₹ 34,05,420	◆ -15.93%
December	₹ 42,41,103	○ 24.54%



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METRIC: Week-over-Week % Growth of Transaction Amount.

DAX FORMULA:

```
WOW_growth =  
var previous_week_trn_amt=CALCULATE(SUM(credit_card[Total_Trans_Amt]),  
DATEADD(calendar_table[Date],-7,DAY))  
RETURN DIVIDE(SUM(credit_card[Total_Trans_Amt])-previous_week_trn_amt,previous_week_trn_amt,0)
```

RESULT SET:

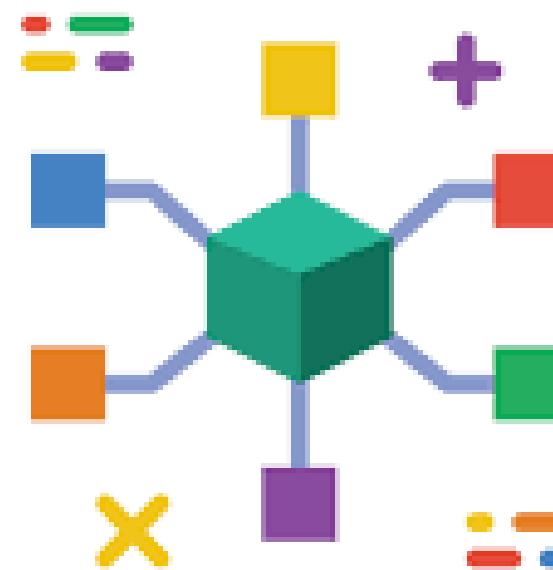
week_number	Sum of Total_Trans_Amt	WOW_growth
1	₹ 8,35,767	0.00%
2	₹ 8,44,739	1.07%
3	₹ 9,23,367	9.31%
4	₹ 8,69,235	-5.86%
5	₹ 8,49,078	-2.32%
6	₹ 8,98,867	5.86%
7	₹ 8,90,756	-0.90%
8	₹ 8,68,091	-2.54%
9	₹ 8,81,861	1.59%
10	₹ 7,93,080	-10.07%



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METRIC: CAC Calculated as a ratio of the transaction amount.

DAX FORMULA:

```
CAC_via_trnAmt = DIVIDE(SUM(credit_card[Customer_Acq_Cost]),  
SUM(credit_card[Total_Trans_Amt]),0)
```

RESULT SET:

0.02

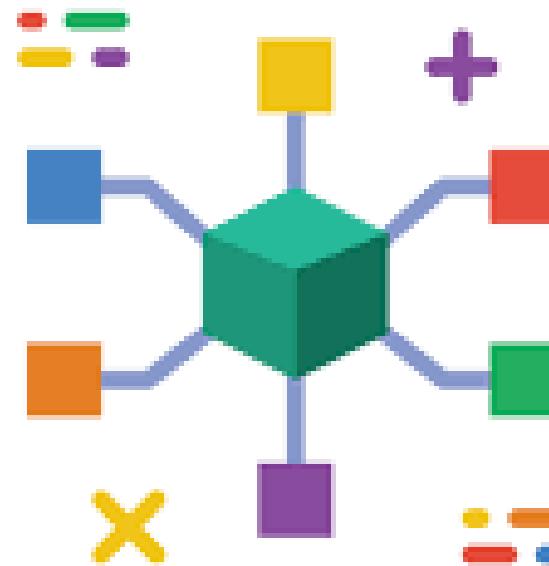
CAC_via_trnAmt



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METRIC: Yearly Average Aggregated avg utilization ratio for all clients

DAX FORMULA:

```
Yearly_average_utilization =  
AVERAGE(credit_card[Avg_Utilization_Ratio])/DISTINCTCOUNT(credit_card[current_year])
```

RESULT SET:

0.27

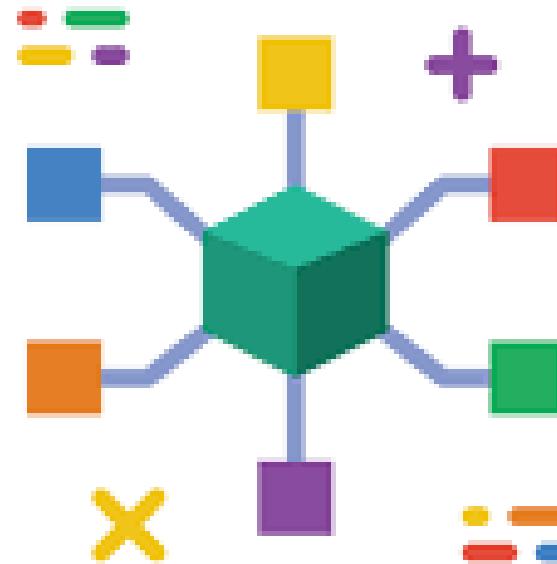
Yearly_average_utilization



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METRIC: Interest Earned as % of Total Revolving Balance ,Shows the portion of revolving balances generating interest.

DAX FORMULA:

```
percentage_earned =  
DIVIDE(SUM(credit_card[Interest_Earned]),SUM(credit_card[Total_Revolving_Bal]),0)
```

RESULT SET:

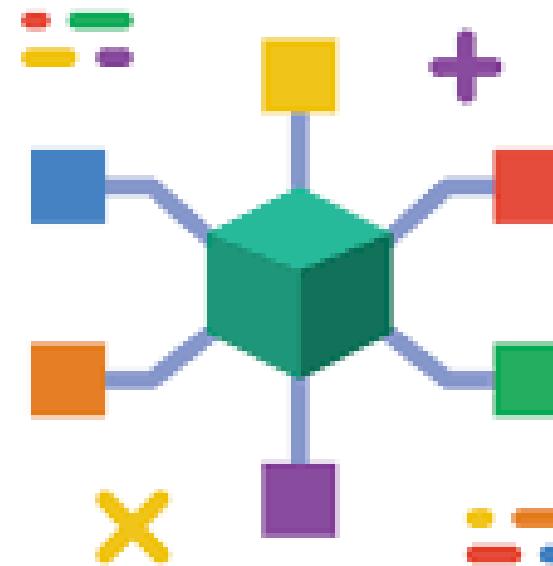
Client_Num	percentage_earned
708082083	264.49%
708083283	2.76%
708084558	11.44%
708085458	0.00%
708086958	134.16%
708095133	15.01%
708098133	11.27%
708099183	21.88%
708100533	43.42%
708103608	150.64%
708104658	82.25%
Total	66.63%



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METRIC: Top 5 Clients by Transaction Amount

DAX FORMULA:

```
top_5_client_by_trn_amt =  
topn(5,SUMMARIZE('credit_card','credit_card'[Client_Num],  
"total amt",SUM('credit_card'[Total_Trans_Amt])),[total amt],DESC)
```

RESULT SET:

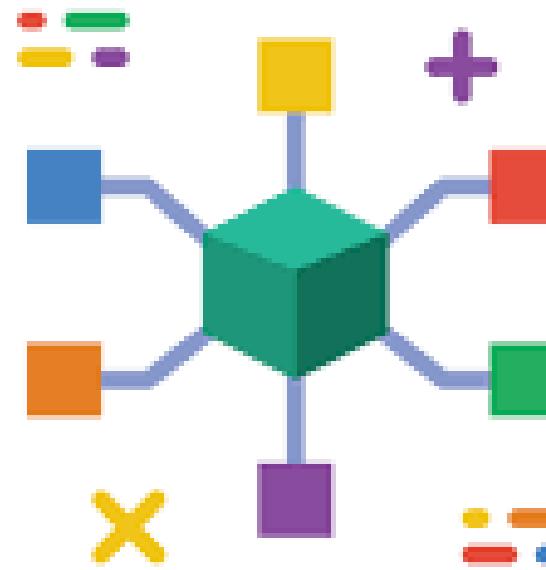
Client_Num	total amt
718140783	₹ 18,484
956622169	₹ 19,597
941614504	₹ 18,504
920819113	₹ 79,463
919695363	₹ 19,739



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METRIC: Avg Utilization Ratio > 80%**: Clients exceeding high credit usage.

DAX FORMULA:

```
Avg_utl_limit_exceed_80% = IF(credit_card[Avg_Utilization_Ratio]>=0.80,TRUE,FALSE)
```

RESULT SET:

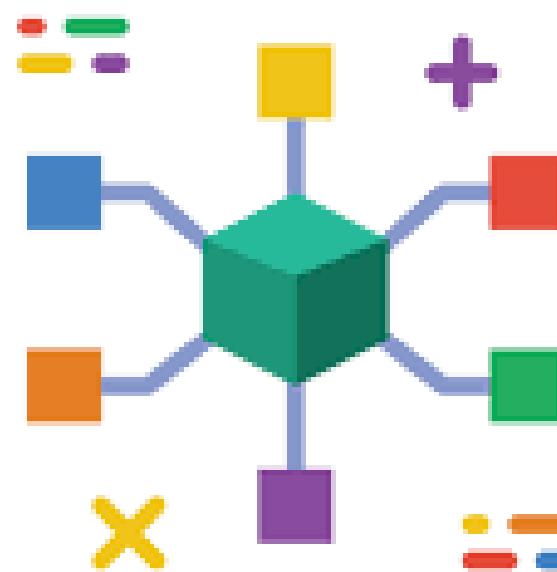
Interest_Earned	Delinquent_Acc	Week of Year	Avg_utl_limit_exceed_80%	Transaction_Status_6_Months	normalized_revolving_Bal	Credit Risk Score	risk_type	High_risk_flag
8196.00%	0	25	False	Transaction not made	0.44497417560588	26.95%	Mid Risk	Low Risk Client
22583.00%	0	25	False	Transaction not made	0.574096146205801	28.18%	Mid Risk	Low Risk Client
31792.00%	0	25	False	Transaction not made	0.392928088994835	40.01%	Mid Risk	Low Risk Client
12848.00%	0	25	False	Transaction not made	0.5502582439412	14.76%	Low Risk	Low Risk Client
84800.00%	0	26	False	Transaction not made	0.23798172427493	7.66%	Low Risk	Low Risk Client
18315.00%	0	26	True	Transaction not made	0.899880810488677	61.90%	High Risk	High Risk Client
292666.00%	0	26	False	Transaction not made	0.523639253079062	12.57%	Low Risk	Low Risk Client
124332.00%	0	26	False	Transaction not made	0.580850218514104	22.22%	Mid Risk	Low Risk Client
174869.00%	0	26	False	Transaction not made	0.554231227651967	15.73%	Low Risk	Low Risk Client
110032.00%	0	26	True	Transaction not made	0.670639650377433	54.11%	High Risk	High Risk Client



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METRIC: Customer Churn Indicator**

KPI: Clients with no transactions in the last 6 months

DAX FORMULA:

```
Transaction_Status_6_Months =  
var total_trn_vol=CALCULATE(SUM(credit_card[Total_Trans_Vol]),  
DATESINPERIOD(calendar_table[Date],MAX(calendar_table[Date]),-6,MONTH))  
return IF(ISBLANK(total_trn_vol),"Transaction not made","Transaction Made")
```

RESULT SET:

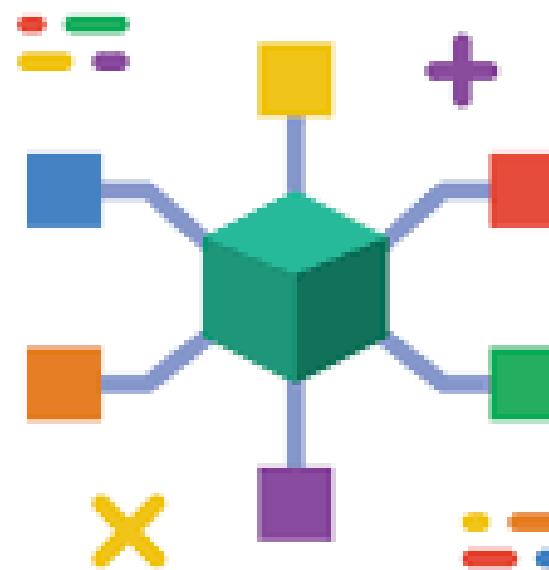
Avg_Utilization_Ratio	Use Chip	Exp Type	Interest_Earned	Delinquent_Acc	Week of Year	Avg_utl_limit_exceed_80%	Transaction_Status_6_Months	normalized_revolving_Bal
0	Swipe	Bills	112372.00%	0	27	False	Transaction not made	0
0	Swipe	Bills	45126.00%	0	29	False	Transaction not made	0
0	Swipe	Bills	24120.00%	0	31	False	Transaction not made	0
0	Swipe	Bills	25694.00%	0	31	False	Transaction not made	0
0	Swipe	Bills	65286.00%	0	31	False	Transaction not made	0
0	Swipe	Bills	86716.00%	0	31	False	Transaction not made	0
0	Swipe	Bills	100100.00%	0	32	False	Transaction Made	0
0	Swipe	Bills	17435.00%	0	33	False	Transaction Made	0
0	Swipe	Bills	102080.00%	0	33	False	Transaction Made	0
0	Swipe	Bills	16779.00%	0	33	False	Transaction Made	0
0	Swipe	Bills	36225.00%	0	34	False	Transaction Made	0
0	Swipe	Bills	103246.00%	0	35	False	Transaction Made	0



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METRIC: Percentage of clients with delinquent accounts.

DAX FORMULA:

```
deliquency_rate =  
var delinquent_acc=CALCULATE(COUNTROWS(credit_card),credit_card[Delinquent_Acc]>0)  
var total_rows_count=COUNTROWS(credit_card)  
return DIVIDE(delinquent_acc,total_rows_count)
```

RESULT SET:

6.06%

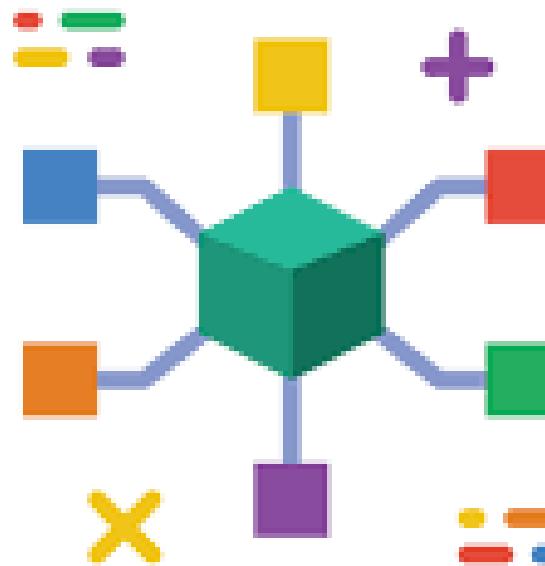
deliquency_rate



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METRIC: Credit Risk Score based on Avg_Utilization_Ratio, Delinquent_Acc, and Total_Revolving_Bal

DAX FORMULA:

```
Credit Risk Score =  
0.5*credit_card[Avg_Utilization_Ratio]+0.3*credit_card[Delinquent_Acc]  
+0.2*credit_card[normalized_revolving_Bal]
```

RESULT SET:

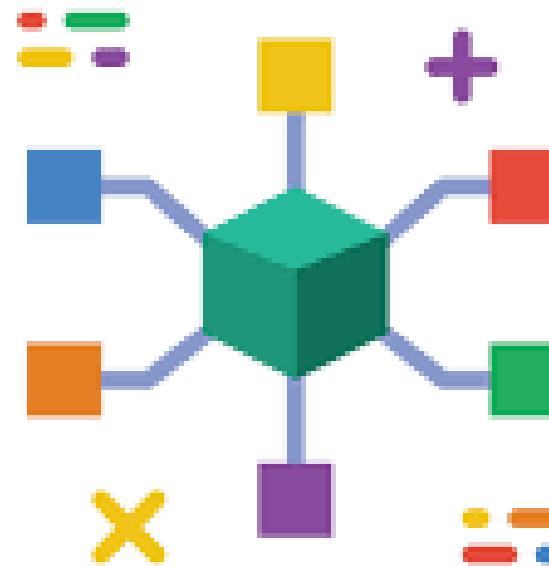
Week of Year	Avg_utl_limit_exceed_80%	Transaction_Status_6_Months	normalized_revolving_Bal	Credit Risk Score	risk_type
0	1	False	Transaction not made	0.703615415176798	24.77% Mid Risk
0	1	True	Transaction not made	0.904648390941597	60.59% High Risk
0	1	False	Transaction not made	0.613428684942392	49.52% Mid Risk
0	1	False	Transaction not made	0.322208978943186	34.64% Mid Risk
0	1	False	Transaction not made	0.601112435439015	44.77% Mid Risk
0	1	False	Transaction not made	0.388955105284068	12.08% Low Risk
0	1	False	Transaction not made	0.532379817242749	40.55% Mid Risk
0	1	False	Transaction not made	0.757647993643226	28.10% Mid Risk
0	1	False	Transaction not made	0.508144616607072	41.26% Mid Risk



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METRIC: Show how client income correlates with their credit limit

DAX FORMULA: For this i used correlation coefficient quick measure

Quick measure

Select a calculation to create a measure or describe the measure you need and we'll generate suggestions in DAX, which you can customize later.

Calculations Suggestions with Copilot

Correlation coefficient

Calculate the correlation coefficient between two values over a category. Originally suggested by Daniil Maslyuk in the quick measures gallery. [Learn more](#)

Category Client_Num X | >

Measure X Sum of Income X | >

Measure Y Sum of Credit_Limit X | >

RESULT SET:

0.13

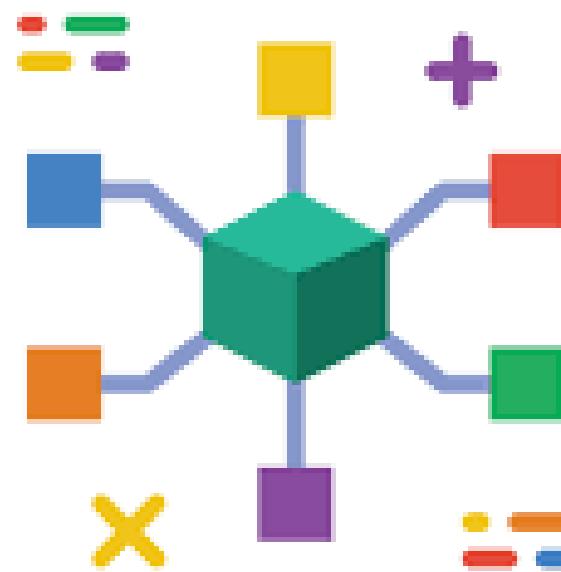
Income and Credit_Limit correlation for Client_Num



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METRIC: Average Customer Satisfaction Score by Card Category

DAX FORMULA:

```
average_cus_sat =  
SUMMARIZE(credit_card,credit_card[Card_Category],"avg_satisfaction_score",  
ROUND(AVERAGE(customer[Cust_Satisfaction_Score]),2))
```

RESULT SET:

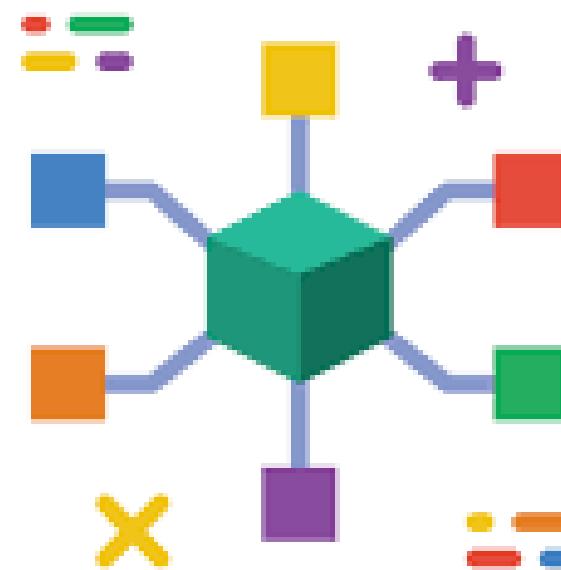
Card_Category	avg_satisfaction_score
Blue	3.2
Silver	3.22
Gold	3.05
Platinum	2.72



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METRIC: Analyze how credit limit impacts loan approvals.

DAX FORMULA:

```
Loan_yes =  
CALCULATE(AVERAGE(credit_card[Credit_Limit]),customer[Personal_loan]="Yes")
```



```
Loan_no =  
CALCULATE(AVERAGE(credit_card[Credit_Limit]),customer[Personal_loan]="No")
```

RESULT SET:

8.56K

Loan_yes

8.65K

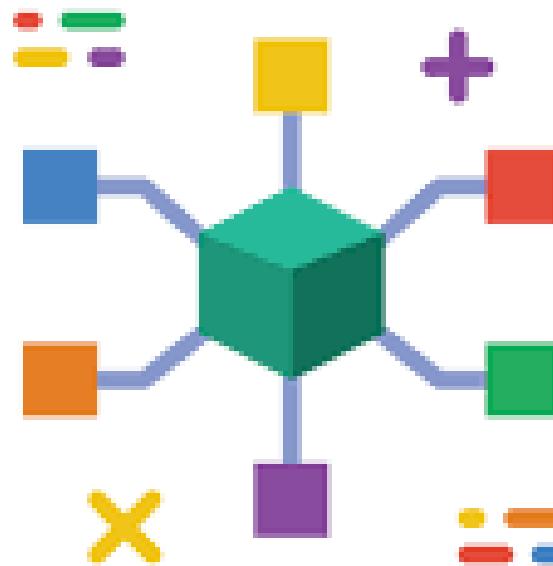
Loan_no



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METRIC: Clients flagged for having Total_Revolving_Bal exceeding 90% of Credit Limit and high Avg Utilization Ratio

DAX FORMULA:

```
High_risk_flag =  
if(credit_card[Total_Revolving_Bal]>0.90  &&  
credit_card[Avg_Utilization_Ratio]>0.75,"High Risk Client","Low Risk Client")
```

RESULT SET:

	Avg_utl_limit_exceed_80%	Transaction_Status_6_Months	normalized_revolving_Bal	Credit Risk Score	risk_type	High_risk_flag
5	<i>False</i>	Transaction not made	0.383790226460071	30.58%	Mid Risk	Low Risk Client
	<i>False</i>	Transaction Made	0.751688518077076	56.28%	High Risk	Low Risk Client
51	<i>False</i>	Transaction Made	0.34326579261025	42.12%	Mid Risk	Low Risk Client
51	<i>False</i>	Transaction Made	0.448947159316647	47.58%	Mid Risk	Low Risk Client
51	<i>False</i>	Transaction Made	0.504966229638458	67.40%	High Risk	Low Risk Client
50	<i>False</i>	Transaction Made	0.707985697258641	74.86%	High Risk	Low Risk Client
50	<i>False</i>	Transaction Made	0.583631307111641	74.07%	High Risk	Low Risk Client
50	<i>False</i>	Transaction Made	0.709574890742948	57.94%	High Risk	Low Risk Client
50	<i>False</i>	Transaction Made	0.110448947159317	32.61%	Mid Risk	Low Risk Client
49	<i>False</i>	Transaction Made	0.547477155343663	48.90%	Mid Risk	Low Risk Client



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CONCLUSION

The analysis of Bank of America's credit card data in Power BI provided key insights into customer behavior, credit utilization, and delinquency risks. By calculating important metrics like transaction amounts, credit limits, and risk factors, the report helps identify high-risk clients and areas for improvement. These insights support better decision-making for customer retention, risk management, and overall financial performance.



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 <https://github.com/pankajkumar-data-analyst>



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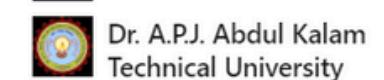
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