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Finance Analysis using Dax Function







Introduction



In this presentation, we delve into the art of financial analysis using the robust capabilities of DAX functions in Power BI. DAX, or Data Analysis Expressions, is a powerful formula language that enables the creation of complex calculations and aggregations, transforming data into meaningful insights.

Our focus lies in utilizing DAX to calculate key financial metrics, uncover patterns, and drive data-driven strategies. By implementing advanced functions, we've ensured precise and efficient data analysis, empowering a deeper understanding of financial performance.



Objective

- Running Total of Credit Card Transactions
- Calculate the 4-week moving average of the creditLimit for each client.
- Calculate the mom% growth and wow% growth on transaction amount.
- Calculate Customer Acquisition Cost (CAC) as a Ratio of Transaction Amount.
- Calculate the yearly average of avg_utilization_ratio for all clients.
- Calculate the percentage of Interest_Earned compared to Total_Revolving_Bal for each client.
- Calculate Top 5 Clients by Total Transaction Amount.
- Identify clients whose Avg_Utilization_Ratio exceeds 80%.
- Customer Churn Indicator: Create a KPI that flags clients who have not made any transactions ($\text{Total_Trans_Amt} = 0$) in the last 6 months.



Objective

- Delinquency Rate: Calculate the percentage of clients with $\text{Delinquent_Acc} > 0$.
- Credit Risk Score: Create a score for each client based on their $\text{Avg_Utilization_Ratio}$, Delinquent_Acc , and $\text{Total_Revolving_Bal}$.
- Income vs Credit Limit Correlation: Show the correlation between Income and Credit_Limit for all clients.
- Average Customer Satisfaction Score by Credit Card Category: Calculate the average $\text{Cust_Satisfaction_Score}$ by Card_Category .
- Loan Approval vs Credit Limit: Analyze how Credit_Limit affects Personal_loan approval by calculating the average credit limit for clients with and without loans.
- High Risk Clients Flag: Create a flag for clients whose $\text{Total_Revolving_Bal}$ exceeds 90% of their Credit_Limit and who have a high $\text{Avg_Utilization_Ratio}$.

Running Total of Credit Card Transactions

Running Total =
CALCULATE(
[Total Transaction Amount],FILTER
(
ALL('credit card'),'credit card'[Week_Start_Date]<
=MAX('credit card'[Week_Start_Date])
)
)

A running total of credit card transactions gives the cumulative sum of transactions over time, providing insights into customer spending trends. It helps identify high spenders, monitor risks and track credit utilization against limits. Businesses can use it for customer segmentation, revenue forecasting.

Week_Start_Date	Total Transaction Amount	Running Total
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
26 February 2023	\$8,81,861	\$78,61,761
05 March 2023	\$7,93,080	\$86,54,841
12 March 2023	\$9,15,725	\$95,70,566
19 March 2023	\$8,90,081	\$1,04,60,647
26 March 2023	\$7,89,941	\$1,12,50,588
02 April 2023	\$8,09,413	\$1,20,60,001
09 April 2023	\$8,50,979	\$1,29,10,980
16 April 2023	\$8,67,373	\$1,37,78,353
23 April 2023	\$7,84,927	\$1,45,63,280
30 April 2023	\$8,62,036	\$1,54,25,316
07 May 2023	\$8,34,443	\$1,62,59,759
14 May 2023	\$8,27,155	\$1,70,86,914
Total	\$4,55,33,021	\$4,55,33,021

Calculate the 4-week moving average of the creditLimit for each client.

```
Moving_average_4_weeks =  
var weeks4 = DATESINPERIOD('Calendar'[Date],MAX('Calendar'[Date]),-28,DAY)  
  
var total_amount = CALCULATE([Total Transaction Amount],weeks4)  
  
var num_of_weeks= CALCULATE(DISTINCTCOUNT('Calendar'[week_num]),weeks4)  
  
RETURN DIVIDE(total_amount,num_of_weeks,0)
```

4-week moving average of credit limits smooths short-term fluctuations, revealing trends over time. It helps identify anomalies like sudden spikes or drops, provides insights into customer behavior, and evaluates the effectiveness of credit policies.

week_num	Sum of Total_Trans_Amt	Moving_average_4_weeks
1	835767	835767.00
2	844739	840253.00
3	923367	867957.67
4	869235	868277.00
5	849078	871604.75
6	898867	885136.75
7	890756	876984.00
8	868091	876698.00
9	881861	884893.75
10	793080	858447.00
Total	45533021	689950.20

Calculate the mom% growth and wow% growth on transaction amount.



Year	Total Transaction Amount	mom%growth
2023	\$4,55,33,021	10%
January	\$43,22,186	0%
February	\$35,39,575	-18%
March	\$33,88,827	-4%
April	\$41,74,728	23%
May	\$34,26,913	-18%
June	\$35,33,660	3%
July	\$45,46,958	29%
August	\$34,49,868	-24%
September	\$34,52,874	0%
October	\$40,50,909	17%
November	\$34,05,420	-16%
December	\$42,41,103	25%
Total	\$4,55,33,021	10%

mom%growth =
var pre_month = CALCULATE([Total Transaction Amount],
DATEADD('Calendar'[Date],-1,MONTH))

RETURN DIVIDE([Total Transaction Amount]-pre_month,pre_month,0)

wow%growth =
var prev_week = CALCULATE([Total Transaction Amount],
DATEADD('Calendar'[Date],-7,DAY))

RETURN DIVIDE([Total Transaction Amount]-prev_week,prev_week,0)

week_num	Total Transaction Amount	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%
Total	\$4,55,33,021	2.27%

Calculate Customer Acquisition Cost (CAC) as a Ratio of Transaction Amount.

ratio_cac_transaction_amount =
DIVIDE(SUM('credit card'[Customer_Acq_Cost]),
[Total Transaction Amount],0)

2.18%


ratio_cac_transaction_amount

Calculating CAC as a ratio of transaction amounts helps assess acquisition efficiency by linking costs to customer spending. It measures ROI, highlights profitable customers. This supports better decision-making, performance benchmarking, and ensures acquisition costs align with long-term profitability.







Calculate the yearly average of avg_utilization_ratio for all clients.



```
avg_utilization_ratio = AVERAGE('credit  
card'[Avg_Utilization_Ratio])
```

0.74
avg_utilization_ratio

The yearly average of the Avg_Utilization_Ratio helps monitor credit usage trends, assess financial health, and guide credit policy decisions. A ratio below 30% is typically good, reflecting low financial stress, while 30%-60% is moderate and manageable. Ratios above 60% may signal financial strain or over-leverage, requiring intervention. Evaluating these ratios helps optimize credit limits, identify risks, and align strategies with customer behavior



Client_Num

708083283

- ☐ 708082083
- ☒ 708083283
- ☐ 708084558
- ☐ 708085458
- ☐ 708086958
- ☐ 708095133
- ☐ 708098133





Calculate the percentage of Interest_Earned compared to Total_Revolving_Bal for each client.




interest_earned_by_revol_balance =

DIVIDE(SUM('credit card'[Interest_Earned]),SUM('credit card'[Total_Revolving_Bal]))





66.63%

interest_earned_by_revol_balance




Calculating the percentage of Interest_Earned compared to Total Revolving Bal for-each client provides insights into how much interest income the bank is generating relative to the client's outstanding revolving credit balance. By analyzing this percentage, the bank can balance profitability with responsible lending, ensuring that customers are not overburdened while maximizing revenue from interest-earning accounts.






Calculate Top 5 Clients by Total Transaction Amount.

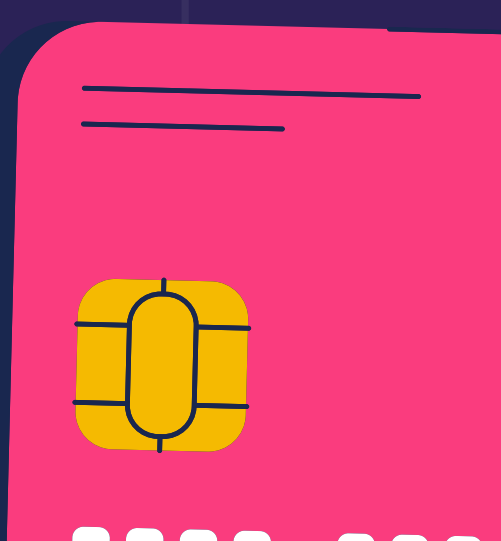


```
top_5_clients = TOPN(5,SUMMARIZE  
('credit card','credit card'[Client_Num],  
"total amount",[Total Transaction Amount]),  
[total amount],DESC)
```

Client_Num ▾	total amount ▾
718140783	18484
941614504	18504
919695363	19739
956622169	19597
920819113	79463




Identifying the top 5 clients based on their transaction amount highlights the most valuable customers. This analysis is crucial for understanding customer behavior, allowing businesses to tailor retention strategies and focus marketing efforts on high-value clients. It also ensures that resources are allocated toward maintaining strong relationships with these clients.







Identify clients whose Avg_Utilization_Ratio exceeds 80%.





```
check_exceeds_80 =  
if (  
  [Avg_Utilization_Ratio] > 0.08,TRUE,FALSE  
)
```



Avg_utilization_ratio above 80% helps identify those who may be at a higher risk of default or financial strain. A high Avg_utilization_ratio often suggests that a client is nearing their credit limit, which could lead to payment issues or overdue accounts, Identifying these clients early allows for proactive intervention to manage risk and offer tailored financial advice.





Customer Churn Indicator: Create a KPI that flags clients who have not made any transactions (Total_Trans_Amt = 0) in the last 6 months.

churn =

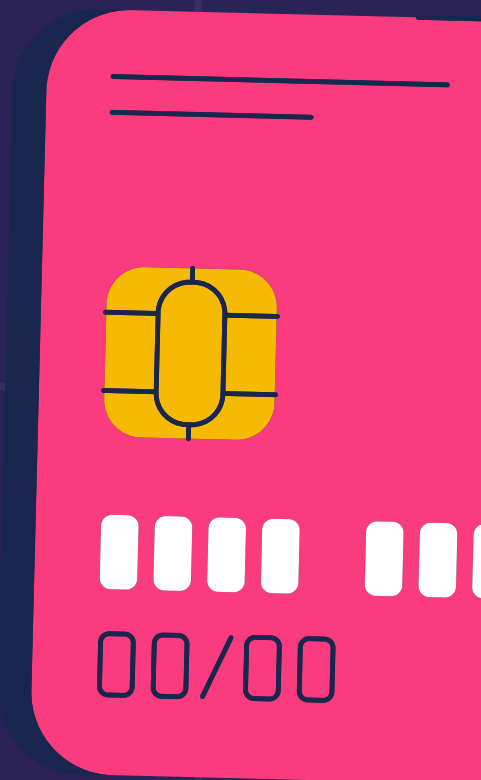
```
var balance = CALCULATE('Table'[Total Transaction Amount],  
    DATESINPERIOD('Calendar'[Date],MAX('Calendar'[Date]),-6,MONTH))
```



```
RETURN if (ISBLANK(balance),"Churned","Not_Churned")
```



The Customer Churn Indicator is a key metric for identifying clients who are no longer engaging with the bank's credit card offerings.

The above DAX query flags clients with no transactions (Total_Trans_Amt = 0) in the last 6 months, indicates customers who have become inactive in terms of their credit card usage. A total transaction amount of zero over a six-month period suggests that these customers are no longer engaging with the bank's credit card products.





Delinquency Rate: Calculate the percentage of clients with
 $\text{Delinquent_Acc} > 0$.

Delinquency Rate =


```
var greater_zero = CALCULATE(countrows('credit card'),  
'credit card'[Delinquent_Acc]>0)
```

```
var total_rows =COUNTROWS('credit card')
```

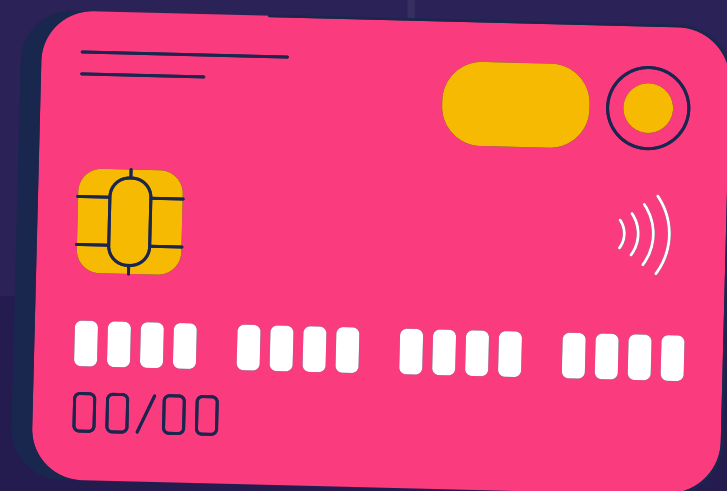
```
return DIVIDE(greater_zero,total_rows,0)
```



6.06%

Delinquency Rate



The Delinquency Rate, defined as the percentage of clients with $\text{Delinquent_Acc} > 0$, indicates the proportion of clients whose accounts are past due or have unpaid balances. Specifically, this metric identifies clients who have one or more accounts marked as delinquent, meaning they have missed at least one payment or are behind on their scheduled payments.





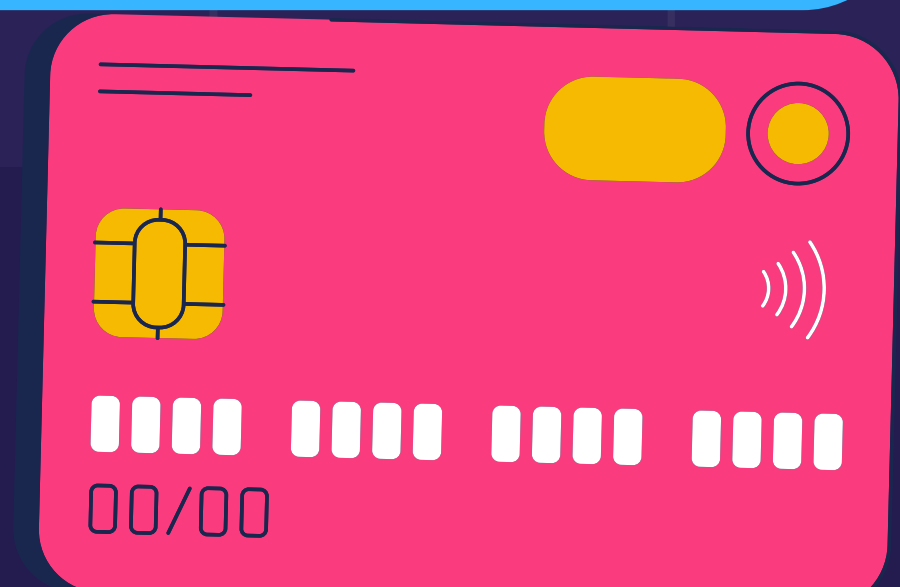
Credit Risk Score: Create a score for each client based on their Avg_Utilization_Ratio, Delinquent_Acc, and Total_Revolving_Bal.

STEP 1 :

normalized_revolving_balance =
DIVIDE('credit card'[Total_Revolving_Bal]-
MIN('credit card'[Total_Revolving_Bal]),
MAX('credit card'[Total_Revolving_Bal])-
MIN('credit card'[Total_Revolving_Bal]),0)

STEP 2 :

credit_risk_score =
[Avg_Utilization_Ratio]*0.5 +
'credit card'[normalized_revolving_balance] *0.3 +
'credit card'[Delinquent_Acc]*0.2



Income vs Credit Limit Correlation: Show the correlation between Income and Credit_Limit for all clients.

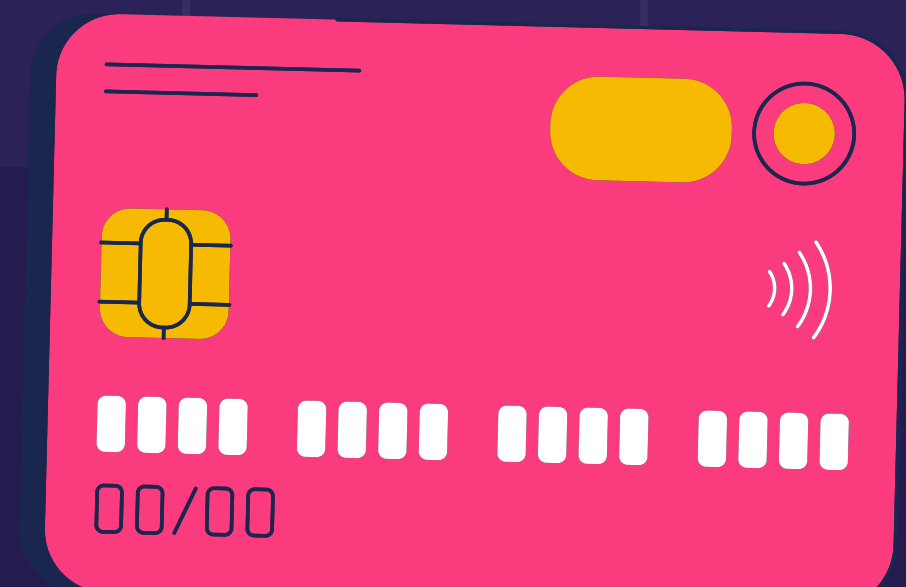
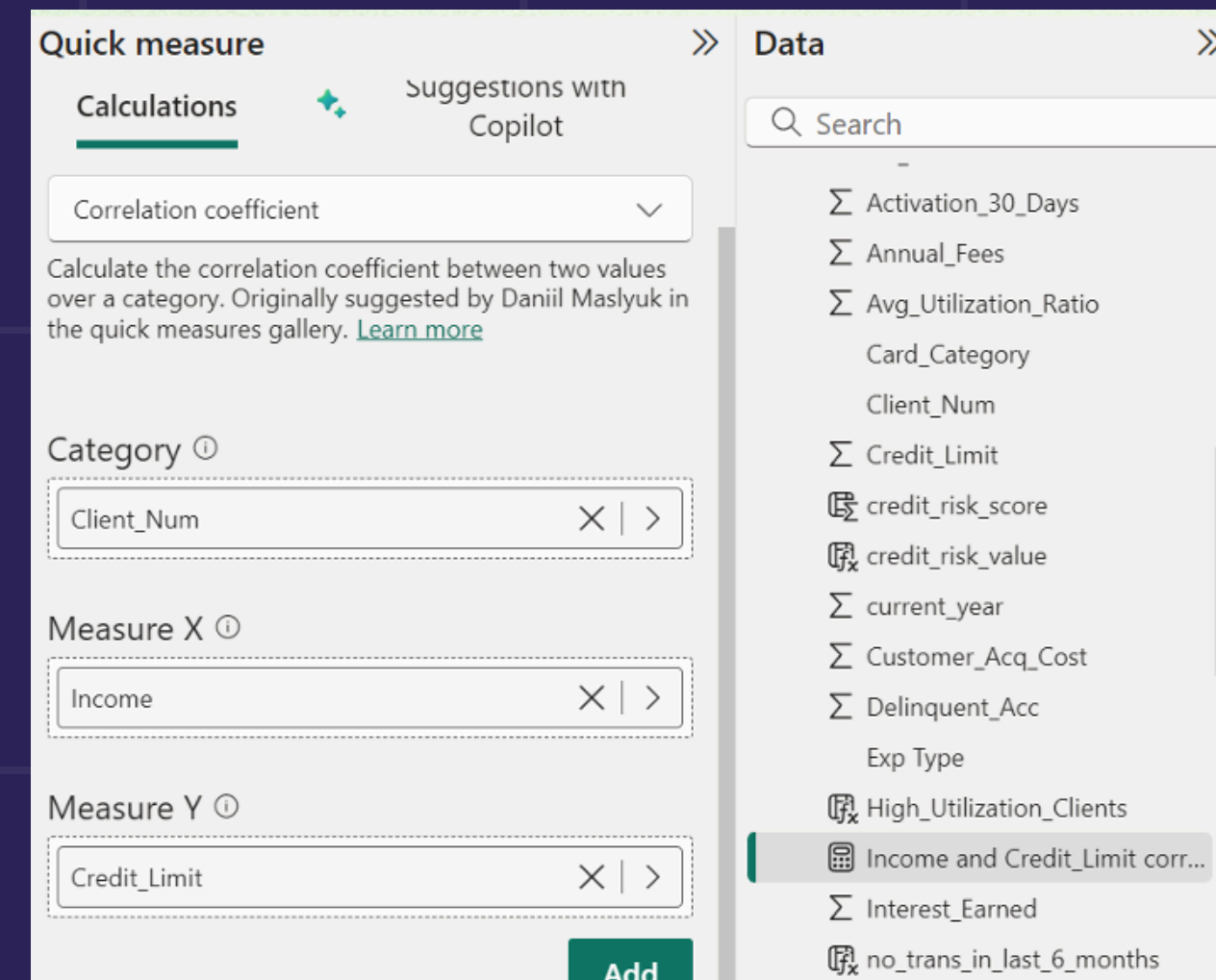
In this analysis, we utilized Quick Measures to calculate the correlation between different metrics.

Category: Client_Num

Measure X: Income

Measure Y: Credit_Limit

This setup allows us to evaluate the relationship between Income and Credit_Limit for each client.




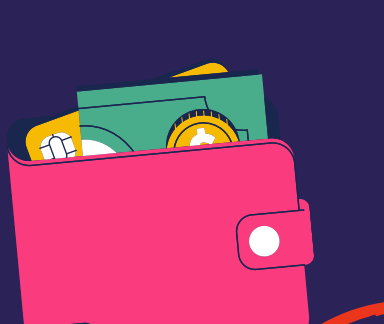


Average Customer Satisfaction Score by Credit Card Category: Calculate the average Cust_Satisfaction_Score by Card_Category.

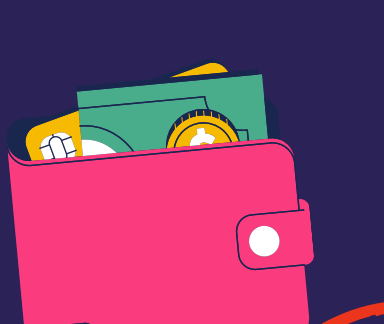
```
avg_satisfaction_score =  
    SUMMARIZE('credit card','creditcard'[Card_Category],  
    "avg_satisfaction_score",AVERAGE(customer[Cust_Satisfaction_Score]))
```

Card_Category ▾	avg_satisfaction_score ▾
Blue	3.19927536231884
Silver	3.22187981510015
Gold	3.04663212435233
Platinum	2.71641791044776

Calculating the average customer satisfaction score by card category provides insights into how clients feel about their credit cards and the services provided. This metric is valuable for understanding customer preferences and can guide product development and marketing strategies aimed at improving customer experience and satisfaction.

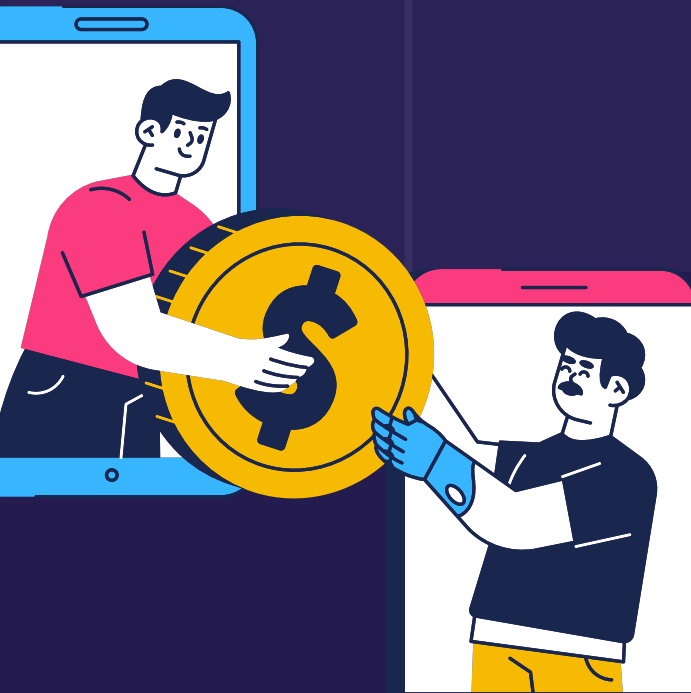


Loan Approval vs Credit Limit: Analyze how Credit_Limit affects Personal_loan approval by calculating the average credit limit for clients with and without loans

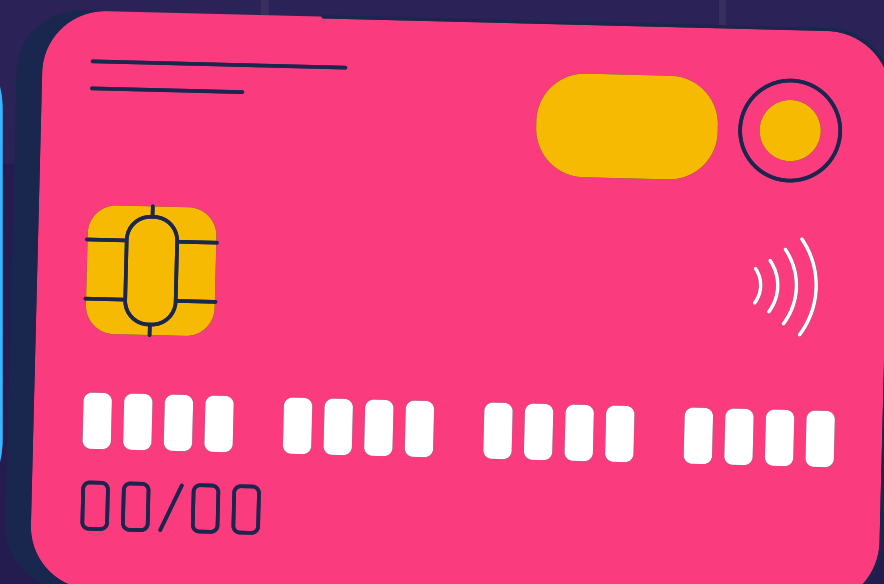


loan_approval_yes = CALCULATE(AVERAGE
(`'credit card'`[Credit_Limit]),customer[Personal_loan]="yes")

loan_approval_no = CALCULATE(AVERAGE
(`'credit card'`[Credit_Limit]),customer[Personal_loan]="no")



Analyzing how Credit Limit affects Personal Loan approval by calculating the average credit limit for clients with and without loans provides insights into the relationship between a client's available credit and their likelihood of being approved for a personal loan.

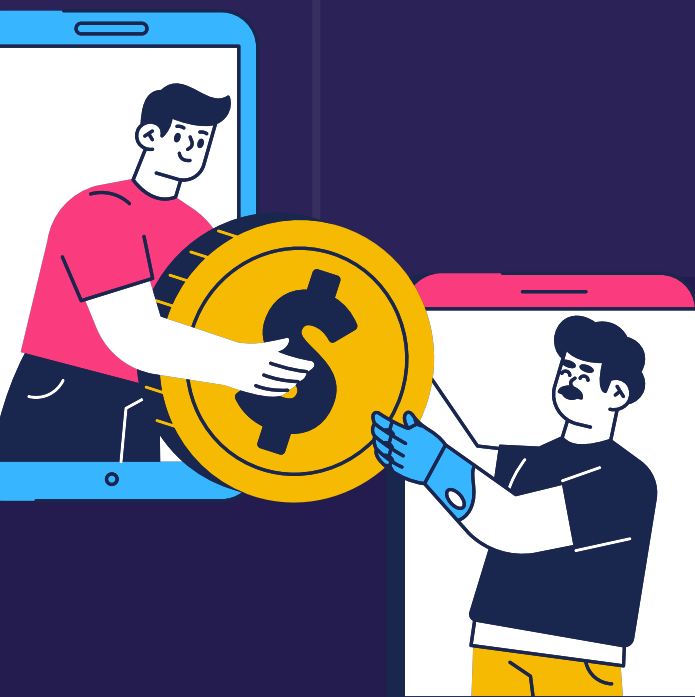




High Risk Clients Flag: Create a flag for clients whose Total_Revolving_Bal exceeds 90% of their Credit_Limit and who have a high Avg_Utilization_Ratio.



flag_clients =
if('credit card'[normalized_revolving_balance]>0.9 &&
[Avg_Utilization_Ratio]>0.8,"flagged","not flagged")



Creating a High-Risk Clients Flag for clients where Total Revolving Balance exceeds 90% of their Credit Limit and who have a high Avg Utilization Ratio indicates a group of customers who are heavily reliant on their available credit and may be at significant financial risk.





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