

# POWER BI

## FINANCIAL

## ANALYSIS

## USING DAX

# INTRODUCTION

You are a Financial Data Analyst tasked with analyzing credit card usage and financial metrics for a banking institution. Using the provided data, you will create reports in Power BI by applying DAX functions. Your goal is to calculate financial metrics like running totals, moving averages, and growth rates, and generate KPIs that assess customer behavior, credit utilization, and delinquency risk. The analysis will provide key insights for improving customer retention and financial performance.





# Analysis Objectives



- **Running Total: 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.**

# Analysis Objectives



- **Delinquency Rate:** Calculate the percentage of clients with `Delinquent_Acc > 0`.
- **Credit Risk Score:** Create a score for each client based on their `Avg_Utilization_Ratio`, `Delinquent_Acc`, and `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 `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 `Total_Revolving_Bal` exceeds 90% of their `Credit_Limit` and who have a high `Avg_Utilization_Ratio`.

# RUNNING TOTAL OF CREDIT CARD TRANSACTIONS

Week_Start_Date	Total_Transaction_Amount	Running_Total
01 January 2023	\$835,767	\$835,767
08 January 2023	\$844,739	\$1,680,506
15 January 2023	\$923,367	\$2,603,873
22 January 2023	\$869,235	\$3,473,108
29 January 2023	\$849,078	\$4,322,186
05 February 2023	\$898,867	\$5,221,053
12 February 2023	\$890,756	\$6,111,809
19 February 2023	\$868,091	\$6,979,900
26 February 2023	\$881,861	\$7,861,761
05 March 2023	\$793,080	\$8,654,841
12 March 2023	\$915,725	\$9,570,566
19 March 2023	\$890,081	\$10,460,647
26 March 2023	\$789,941	\$11,250,588
02 April 2023	\$809,413	\$12,060,001
09 April 2023	\$850,979	\$12,910,980
16 April 2023	\$867,373	\$13,778,353
23 April 2023	\$784,927	\$14,563,280
30 April 2023	\$862,036	\$15,425,316
07 May 2023	\$834,443	\$16,259,759
14 May 2023	\$837,155	\$17,096,914
21 May 2023	\$931,258	\$18,028,172
28 May 2023	\$824,057	\$18,852,229
04 June 2023	\$859,507	\$19,711,736
<b>Total</b>	<b>\$45,533,021</b>	<b>\$45,533,021</b>

```
Total_Transaction_Amount = sum('credit card'[Total_Trans_Amt])
```

```
Running_Total = CALCULATE([Total_Transaction_Amount],  
FILTER(ALL('credit card'),  
'credit card'[Week_Start_Date]  
<= MAX('credit card'[Week_Start_Date])))
```

## Why Calculate Running Total?

Calculating the running total of credit card transactions helps to track the cumulative spending of clients over time. It offers a clearer view of spending patterns and allows businesses to evaluate whether spending is increasing or decreasing. This metric is particularly useful for forecasting and identifying trends that can inform marketing strategies or risk assessments.



# 4-WEEK MOVING AVERAGE OF CREDIT LIMIT

week_num	Total_Transaction_Amount	Moving_avg_for_weeks
1	\$835,767	\$835,767.00
2	\$844,739	\$840,253.00
3	\$923,367	\$867,957.67
4	\$869,235	\$868,277.00
5	\$849,078	\$871,604.75
6	\$898,867	\$885,136.75
7	\$890,756	\$876,984.00
8	\$868,091	\$876,698.00
9	\$881,861	\$884,893.75
10	\$793,080	\$858,447.00
11	\$915,725	\$864,689.25
12	\$890,081	\$870,186.75
13	\$789,941	\$847,206.75
14	\$809,413	\$851,290.00
15	\$850,979	\$835,103.50
16	\$867,373	\$829,426.50
17	\$784,927	\$828,173.00
18	\$862,036	\$841,328.75
19	\$834,443	\$837,194.75
20	\$837,155	\$829,640.25
<b>Total</b>	<b>\$45,533,021</b>	<b>\$689,950.20</b>

```
1 Moving_avg_for_weeks =  
2  
3   var week4 = DATESINPERIOD('calendar'[Date],max('calendar'[Date]),-28,DAY)  
4  
5   var total_amount = CALCULATE([Total_Transaction_Amount],week4)  
6  
7   VAR num_of_weeks = CALCULATE(DISTINCTCOUNT('calendar'[week_num]),week4)  
8  
9   RETURN DIVIDE(total_amount,num_of_weeks,0)
```

## 4-Week Moving Average of Credit Limit

A 4-week moving average of credit limits smooths out short- term fluctuations, providing a more stable view of how a client's credit availability is changing over time. This metric helps in analyzing credit behavior and understanding whether credit limits are increasing or decreasing consistently. It also allows the business to respond quickly to shifts in credit utilization trends.

# MOM% GROWTH ON TRANSACTIONS

Year	Total_Transaction_Amount	mom%growth	
2023	\$45,533,021		10%
January	\$4,322,186	▲	0%
February	\$3,539,575	◆	-18%
March	\$3,388,827	▲	-4%
April	\$4,174,728	●	23%
May	\$3,426,913	◆	-18%
June	\$3,533,660	▲	3%
July	\$4,546,958	●	29%
August	\$3,449,868	◆	-24%
September	\$3,452,874	▲	0%
October	\$4,050,909	●	17%
November	\$3,405,420	◆	-16%
December	\$4,241,103	●	25%
Total	\$45,533,021		10%

```
mom%growth =  
var prev_month = CALCULATE([Total_Transaction_Amount],DATEADD('calendar'[Date],-1,MONTH))  
  
return DIVIDE([Total_Transaction_Amount]-prev_month,prev_month,0)
```

## Role of Month-over-Month Growth

MoM% Growth measures the monthly change in transaction amounts as a percentage. It helps businesses identify longer-term trends in customer spending patterns. By analyzing MoM growth, organizations can understand whether spending is increasing, decreasing, or remaining stable across months. This insight is essential for strategic planning, seasonal analysis, and making data-driven decisions to optimize financial performance.

# WOW% GROWTH ON TRANSACTIONS

week_num	Total_Transaction_Amount	wow%growth
1	\$835,767	0%
2	\$844,739	1%
3	\$923,367	9%
4	\$869,235	-6%
5	\$849,078	-2%
6	\$898,867	6%
7	\$890,756	-1%
8	\$868,091	-3%
9	\$881,861	2%
10	\$793,080	-10%
11	\$915,725	15%
12	\$890,081	-3%
13	\$789,941	-11%
14	\$809,413	2%
15	\$850,979	5%
16	\$867,373	2%
17	\$784,927	-10%
18	\$862,036	10%
19	\$834,443	-3%
20	\$837,155	0%
21	\$931,258	11%
<b>Total</b>	<b>\$45,533,021</b>	<b>2%</b>

```
1 wow%growth =  
2  
3 var prev_week = CALCULATE([Total_Transaction_Amount],DATEADD('calendar'[Date],-7,day))  
4  
5 return DIVIDE([Total_Transaction_Amount]-prev_week,prev_week,0)
```

## Role of Week-over-Week Growth

WoW% Growth evaluates the weekly change in transaction amounts as a percentage. It focuses on short-term trends and captures quick fluctuations in customer spending behavior. Businesses can use WoW growth analysis to identify weekly patterns, respond swiftly to changes, and adjust marketing campaigns or financial strategies in real time. It is especially useful for identifying the immediate impact of promotions, events, or other influencing factors.



# CUSTOMER ACQUISITION COST (CAC)

```
ratio_cac_transaction_amount =  
DIVIDE(sum('credit card'[Customer_Acq_Cost]),  
[Total_Transaction_Amount],0)
```

2.18%

ratio\_cac\_transaction\_amount

## What is Customer Acquisition Cost (CAC)?

Customer Acquisition Cost (CAC) calculates how much it costs to acquire a new customer relative to the revenue generated from their transactions. It is a critical metric for evaluating the effectiveness of marketing campaigns and customer acquisition strategies. By comparing CAC to the revenue generated, companies can determine if their investment in marketing is yielding a good return, ensuring resources are used efficiently.

# YEARLY AVG UTILIZATION RATIO FOR EACH CLEINT

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

0.21

avg\_utilization\_ratio

## Yearly Avg Utilization Ratio

The yearly average utilization ratio reflects how frequently clients use their available credit throughout the year. A high utilization ratio might indicate that clients are more reliant on credit, which could signal financial stress or potential credit risk. On the other hand, a low ratio may suggest that clients are not fully utilizing their credit limits, indicating potential underuse or missed opportunities for growth. Here we have added a slicer to get it for each client.

Client\_Num

708084558

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

# RATIO - INTEREST EARNED BY TOTAL REVOLVING BALANCE

```
interest_earned_by_revol_balance =  
DIVIDE(sum('credit card'[Interest_Earned]),  
SUM('credit card'[Total_Revolving_Bal]))
```

134.16%

interest\_earned\_by\_revol\_balance

## Interest Earned vs Total Revolving Balance

This ratio compares the interest earned to the total revolving balance of clients. It provides insights into how effectively the bank is generating revenue from customers who carry a balance over time. By tracking this metric, businesses can better understand their interest income and identify opportunities to minimize delinquency risks while maximizing returns from revolving balances. We have added a slicer to get it for each customer.

Client\_Num

708086958

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



# TOP 5 CLIENTS BY TRANSACTION AMOUNT

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

## Why Top 5 Clients by Transaction Amount?

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.

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

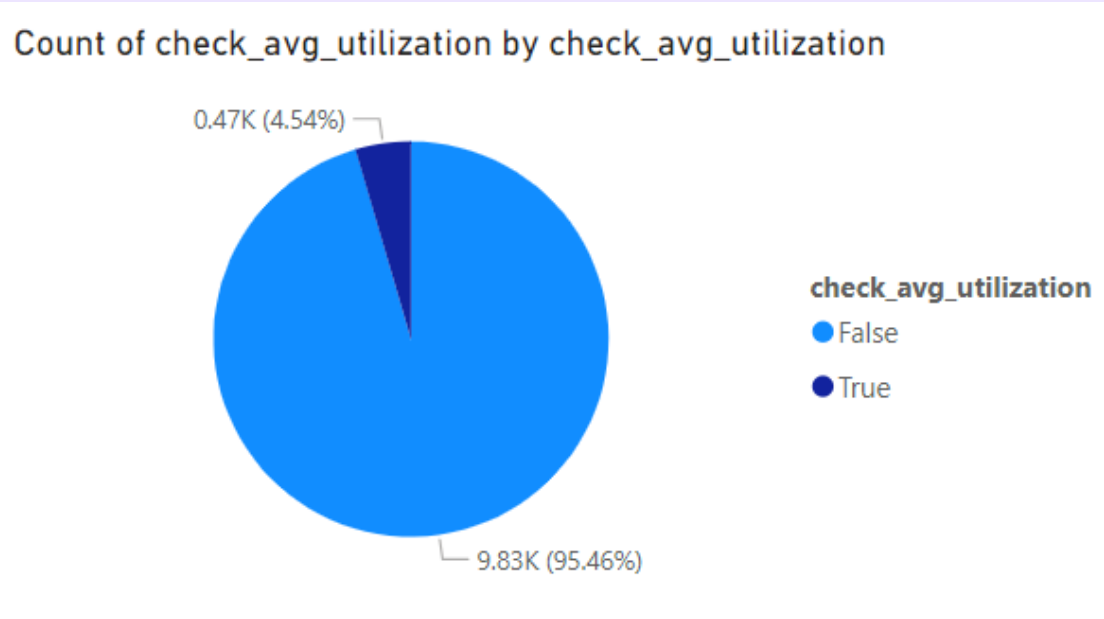
# IDENTIFY CLIENTS WHOSE AVG\_UTILIZATION\_RATIO EXCEEDS 80%.

```
check_avg_utilization =  
IF([avg_utilization_ratio]>0.80,TRUE,FALSE)
```

Avg_Utilization_Ratio	Use Chip	Exp Type	Interest_Earned	Delinquent_Acc	check_avg_utilization
0.801	Swipe	Bills	343.98	0	True
0.798	Swipe	Bills	439.11	0	False
0.798	Swipe	Bills	470.8	0	False
0.808	Swipe	Bills	367.84	0	True
0.868	Swipe	Entertainment	421.2	0	True
0.799	Swipe	Entertainment	426.06	0	False
0.797	Swipe	Entertainment	1344.6	0	False
0.801	Swipe	Entertainment	309.24	0	True
0.868	Swipe	Entertainment	243	0	True
0.801	Swipe	Entertainment	441.12	0	True
0.808	Swipe	Entertainment	328.02	0	True
0.322	Swipe	Fuel	1206.01	0	False

## Why High Utilization Clients (Utilization > 80%)

Flagging clients with a utilization ratio above 80% helps identify those who may be at a higher risk of default or financial strain. A high 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.



# KPI: CUSTOMER CHURN INDICATOR

```
churn =  
  
var balance = CALCULATE([Total_Transaction_Amount],  
  
    DATESINPERIOD('calendar'[Date],MAX('calendar'[Date]),-6,MONTH)  
  
    RETURN IF(ISBLANK(balance),"Churned","Not Churned")
```

## Role of KPI: Customer Churn Indicator?

A customer churn indicator helps identify clients who have not made any transactions in the past 6 months. This metric is essential for understanding customer retention and can highlight potential issues in engagement. By flagging these clients, businesses can target retention efforts or re-engagement campaigns to prevent customer loss and improve long-term loyalty.

churn
Churned
Churned
Churned
Churned
Churned
Not Churned
Not Churned
Not Churned
Not Churned
Not Churned



# PERCENTAGE OF CLIENTS WITH DELINQUENT\_ACC > 0.

```
1 delinquency_rate =  
2  
3 var greater_zero = CALCULATE(COUNTROWS('credit card'),'credit card'[Delinquent_Acc] > 0)  
4  
5 var total_rows = COUNTROWS('credit card')  
6  
7 RETURN DIVIDE(greater_zero,total_rows,0)
```

## Why High Utilization Clients (Utilization > 80%)

The delinquency rate measures the percentage of clients with overdue accounts. This metric is a critical indicator of the financial health of a customer base. A high delinquency rate can signal potential credit risks and may require closer monitoring of client accounts. By analyzing delinquency, businesses can refine their credit policies and take steps to reduce financial exposure.

**6.06%**  
**delinquency\_rate**

# CREDIT RISK SCORE FOR EACH CLIENT

```
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)
```

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

## Why Credit Risk Score for each client?

A credit risk score combines key factors such as utilization ratio, delinquent accounts, and revolving balances to assess the overall creditworthiness of a client. This score provides businesses with a comprehensive view of a client's risk profile, helping to make informed decisions on credit limits, lending, and debt management strategies. Here we first normalized the revolving bal then calculated the score.

normalized_revolving_balance	credit_risk_score
0.488279698053238	0.182983909415971
0.817242749304728	0.427672824791418
0.982121573301549	0.573136471990465
0.601907032181168	0.21007210965435
0.688518077075884	0.269555423122765
0.652761223678983	0.535828367103695
0.422328168454509	0.211698450536353
0.496622963845848	0.451486889153754
0.370282081843464	0.303084624553039
0.486690504568931	0.176507151370679
0.55145013905443	0.541935041716329
0.978943186332936	0.583182955899881
0.601907032181168	0.21507210965435
0.698847834723878	0.355154350417163

# CORRELATION B/W INCOME & CREDITLIMIT FOR ALL CLIENTS

**Quick measure** >>

Select a calculation to create a measure.

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 ⓘ

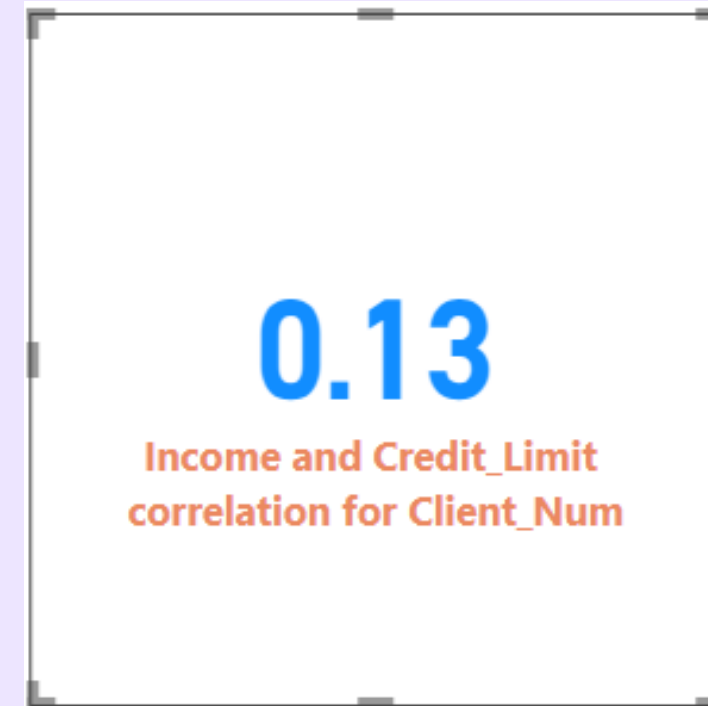
Client\_Num × | >

Measure X ⓘ

Sum of Income × | >

Measure Y ⓘ

Sum of Credit\_Limit × | >



## How we calculated correlation?

We used a Quick Measure in Power BI to calculate the correlation. In this setup: Client Number was placed in the Category field. Income was assigned to the Measure X-axis. Credit Limit was assigned to the Measure Y- axis.

## Why analyzing correlation b/w income and CL?

Analyzing the correlation between a client's income and credit limit ensures that credit is allocated appropriately based on the client's ability to repay. A strong correlation indicates that credit limits align with a client's financial capacity, reducing the risk of overextension. This metric helps in developing responsible lending practices and preventing over-indebtedness.



# AVG CUSTOMER SATISFACTION SCORE BY CARD CATEGORY

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

## Why Satisfaction Score by Card Category?

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.

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

# AVERAGE CREDIT LIMIT FOR CLIENTS WITH LOANS

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

## Role of Average Credit Limit With Loan

The Average Credit Limit for clients with loans reflects the credit extended to customers with existing personal loans. It helps assess financial risk exposure and repayment capacity. A higher limit suggests confidence in the borrower's financial behavior, guiding credit policy adjustments and sustainable lending practices.

**8.56K**  
loan\_approval\_yes

# AVERAGE CREDIT LIMIT FOR CLIENTS WITH LOANS

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

## Role of Average Credit Limit Without Loan

The Average Credit Limit for clients without loans represents the typical credit amount available to customers without personal loans. It helps financial institutions understand creditworthiness and risk appetite. A higher limit often indicates strong financial stability, aiding in targeting loan offers and customizing financial products.

8.65K

loan\_approval\_no

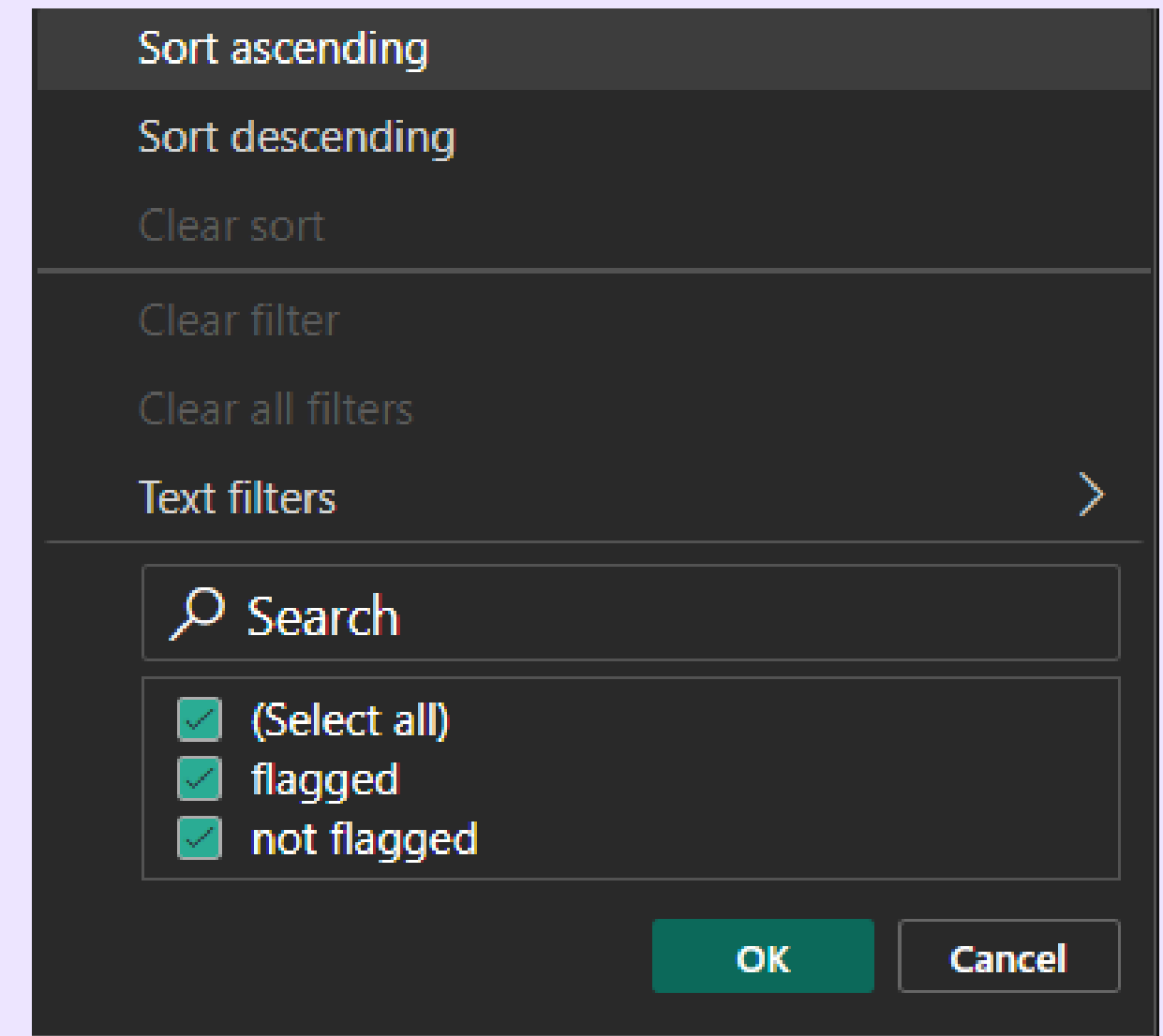


# FLAG HIGH RISK CLIENTS

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

## Why flagging high risk clients?

Flagging clients with a high revolving balance and utilization ratio helps identify those at significant financial risk. These clients are more likely to default or experience financial distress. Early identification allows businesses to take action, such as adjusting credit limits or offering financial counseling, to reduce the risk of defaults and ensure responsible lending.



Sort ascending  
Sort descending  
Clear sort

Clear filter  
Clear all filters  
Text filters >

Search

☒ (Select all)  
☒ flagged  
☒ not flagged

OK Cancel

# Thank You.

*Connect With ME*



7973193965



rahul.nagra.001@gmail.com



Rahul Nagra