FINANCIAL ANALYSIS USING DAX QUERY

PRESENTED BY : KINJAN CHAUHAN

INDEX

PROBLEM BRIEF

You are a Financial Data Analyst tasked with analysing 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.

PROBLEM STATEMENTS

1. Running Total of Credit Card Transactions.
2. Calculate the 4-week moving average of the credit Limit for each client.
3. Calculate the mom% growth and wow% growth on transaction amount.
4. Calculate Customer Acquisition Cost (CAC) as a Ratio of Transaction Amount.
5. Calculate the yearly average of avg_utilization_ratio for all clients.
6. Calculate the percentage of Interest_Earned compared to Total_Revolving_Bal for each client.
7. Calculate Top 5 Clients by Total Transaction Amount.
8. Identify clients whose Avg_Utilization_Ratio exceeds 80%.
9. Customer Churn Indicator: Create a KPI that flags clients who have not made any transactions (Total_Trans_Amt = 0) in the last 6 months.
10. Delinquency Rate: Calculate the percentage of clients with Delinquent_Acc > 0.
11. Credit Risk Score: Create a score for each client based on their Avg_Utilization_Ratio, Delinquent_Acc, and Total_Revolving_Bal.
12. Income vs Credit Limit Correlation: Show the correlation between Income and Credit_Limit for all clients.
13. Average Customer Satisfaction Score by Credit Card Category: Calculate the average Cust_Satisfaction_Score by Card_Category.
14. 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.
15. 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.

1..Running Total of Credit Card Transactions

DAX Query

```
1 Running total = CALCULATE([Total transaction amount],FILTER(ALL('CREDIT
  CARD DETAIL'),'CREDIT CARD DETAIL'[Week_Start_Date] <= MAX('CREDIT CARD
  DETAIL'[Week_Start_Date])))
```

Outcome

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
Total	**$4,55,33,021**	**$4,55,33,021**

2...Calculate the 4-week moving average of the credit Limit for each client.

DAX Query

```
moving _avg =

var week4 = DATESINPERIOD('calender'[Date],MAX('calender'[Date]),-28,DAY)

var total_credit_limit = CALCULATE(SUM('CREDIT CARD DETAIL'[Credit_Limit]),week4)

var number_of_weeks = CALCULATE(DISTINCTCOUNT(calender[week_no]),week4)

return DIVIDE(total_credit_limit,number_of_weeks,0)
```

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

DAX Query for mom% growth

```
mom% growth =
var previous_mon = CALCULATE([Total transaction amount],DATEADD
('calender'[Date],-1,MONTH))

return DIVIDE([Total transaction amount]-previous_mon,previous_mon,0)
```

DAX Query for wow% growth

```
1 wow% growth =
2
3 VAR previous_week = CALCULATE([Total transaction amount],DATEADD
  ('calender'[Date],-7,DAY))
4
5 RETURN DIVIDE([Total transaction amount]-previous_week,previous_week,0)
```

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

DAX Query

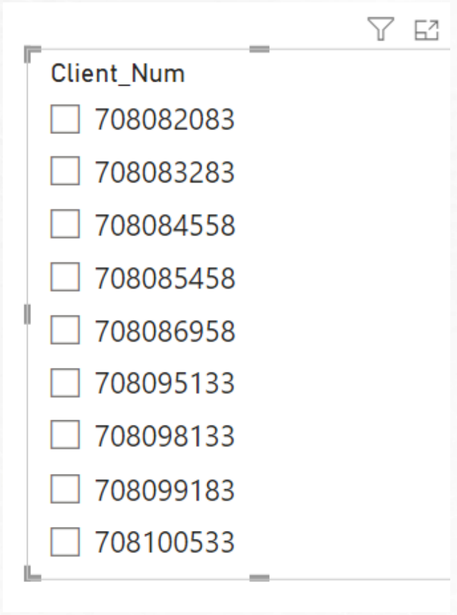
```
cus_acq_cost(CAC) = DIVIDE(SUM('CREDIT CARD DETAIL'[Customer_Acq_Cost]),
[Total transaction amount],0)
```

5..Calculate the yearly average of avg_utilization_ratio for all clients.

DAX Query

```
yearly average utilization ratio =

AVERAGE('CREDIT CARD DETAIL'[Avg_Utilization_Ratio])
```

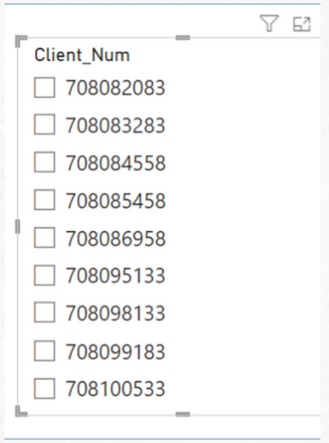


6...Calculate the percentage of Interest_Earned compared to Total_Revolving_Bal for each client.

DAX Query

```
precent_interest earned by revolving bal =

DIVIDE(SUM('CREDIT CARD DETAIL'[Interest_Earned]),SUM('CREDIT CARD DETAIL'[Total_Revolving_Bal]))
```



7...Calculate Top 5 Clients by Total Transaction Amount.

DAX Query

```
top_5_clients_by_Transaction_amount = TOPN(5, SUMMARIZE('CREDIT CARD DETAIL','CREDIT CARD DETAIL'[Client_Num],"Total_amount",[Total transaction amount]),[Total_amount],DESC)
```

Outcome

Client_Num	Total_amount
718140783	18484
956622169	19597
941614504	18504
920819113	79463
919695363	19739

8... Identify clients whose Avg_Utilization_Ratio exceeds 80%.

DAX Query

```
avg_utilization_ratio_above_80% = IF('CREDIT CARD DETAIL'[Avg_Utilization_Ratio]>0.8,
"yes","no")
```

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

DAX Query

```
Churned_clients =

VAR Transaction_amount = CALCULATE([Total transaction amount],DATESINPERIOD
('calender'[Date],MAX('calender'[Date]),-6,MONTH))

RETURN IF(ISBLANK(Transaction_amount),"Churned","Not Churned")
```

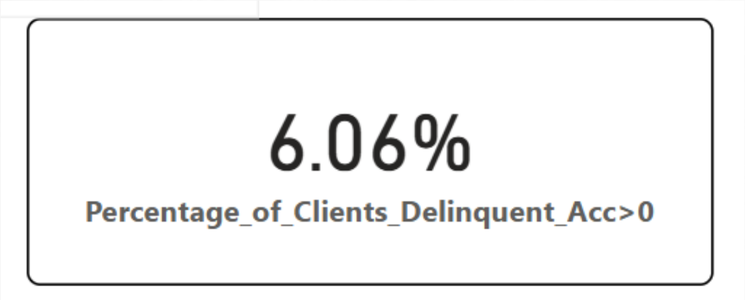
Churned_clients
Churned
Churned
Churned
Churned
Churned
Churned
Churned
Churned
Churned
Churned
Churned
Not Churned
Not Churned

10... Delinquency Rate: Calculate the percentage of clients with Delinquent_Acc > 0.

DAX Query

```
1 Percentage_of_Clients_Delinquent_Acc>0 =
2
3 VAR Deliquent_acc_greater_zero = CALCULATE(COUNTROWS('CREDIT CARD
  DETAIL'),'CREDIT CARD DETAIL'[Delinquent_Acc] >0)
4
5 VAR Total_rows = COUNTROWS('CREDIT CARD DETAIL')
6
7 RETURN DIVIDE(Deliquent_acc_greater_zero,Total_rows,0)
```

Outcome



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

DAX Query

Step 1

```
1 Normalised_Revolving_bal = DIVIDE('CREDIT CARD DETAIL'[Total_Revolving_Bal]-MIN
  ('CREDIT CARD DETAIL'[Total_Revolving_Bal]), MAX('CREDIT CARD DETAIL'
  [Total_Revolving_Bal]) - MIN('CREDIT CARD DETAIL'[Total_Revolving_Bal],0))
```

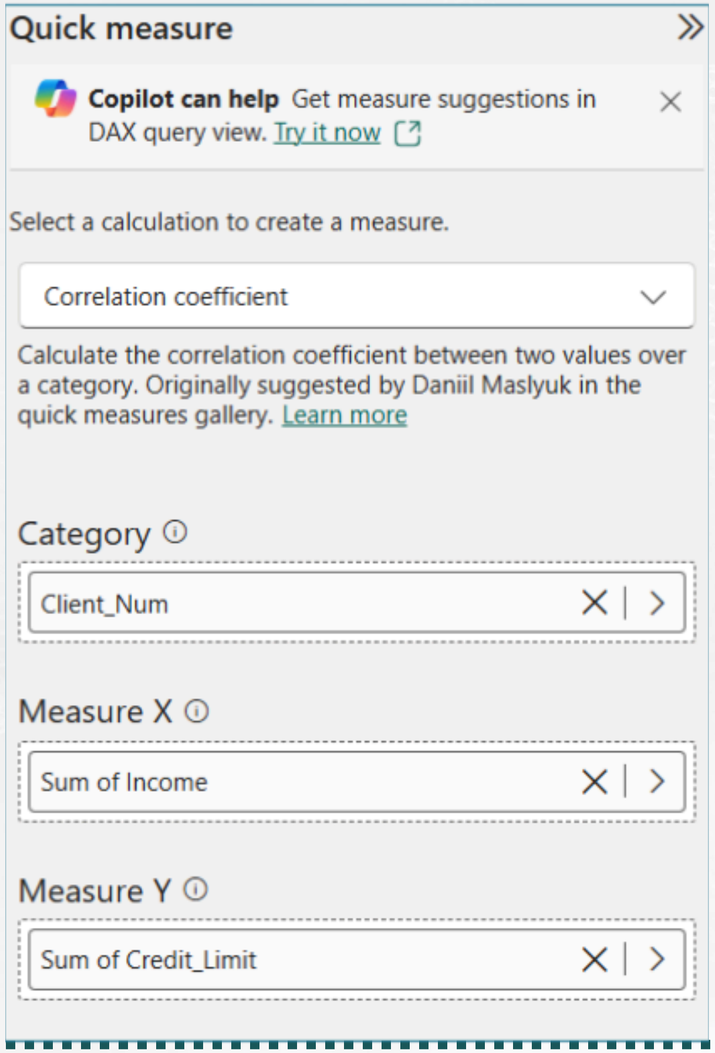
Step 2

```
1 Credit_Risk_Score = 'CREDIT CARD DETAIL'[Avg_Utilization_Ratio] *0.5 + 'CREDIT CARD
  DETAIL'[Normalised_Revolving_bal] * 0.3 + 'CREDIT CARD DETAIL'[Delinquent_Acc] * 0.2
```

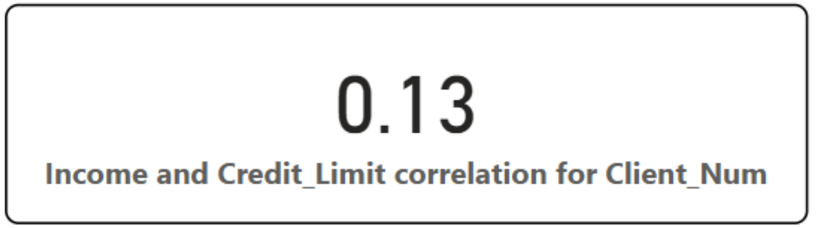
Outcome

Normalised_Revolving_bal	Credit_Risk_Score
0.000	0
0.000	0
0.000	0
0.000	0
0.000	0
0.000	0
0.000	0
0.000	0
0.000	0
0.000	0
0.000	0
0.987	0.406685935637664
1.000	0.6545
0.658	0.398377830750894
0.288	0.122531585220501
0.808	0.398312276519666
0.793	0.268021454112038
1.000	0.366
0.744	0.265241954707986
0.377	0.158991656734207
0.426	0.163151966626937
0.857	0.314710965435042

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



Outcome



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

DAX Query

```
1 Avg_Cust_satisfation_score_by_card_categ = SUMMARIZE('CREDIT CARD DETAIL','CREDIT CARD
  DETAIL'[Card_Category],"avg_satisfaction_score",AVERAGE('CUSTOMER DETAIL'
  [Cust_Satisfaction_Score]))
```

Outcome

Card_Category	avg_satisfaction_score
Blue	3.19927536231884
Silver	3.22187981510015
Gold	3.04663212435233
Platinum	2.71641791044776

14....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.

DAX Query

```
1 Avg_Credit_limit_with_loan_approved = CALCULATE(AVERAGE('CREDIT CARD DETAIL'
  [Credit_Limit]),'CUSTOMER DETAIL'[Personal_loan] = "Yes")
```

```
1 Avg_Credit_limit_with_loan_notapproved = CALCULATE(AVERAGE('CREDIT CARD
  DETAIL'[Credit_Limit]),'CUSTOMER DETAIL'[Personal_loan] = "No")
```

Outcome

15....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.

DAX Query

```
1 High_risk_customer = if ('CREDIT CARD DETAIL'
  [Normalised_Revolving_bal] > 0.9 && 'CREDIT CARD DETAIL'
  [Avg_Utilization_Ratio] >0.8,"Flagged", "Not Flagged")
```

Outcome

Credit_Risk_Score	High_risk_customer
0.366	Not Flagged
0.265241954707986	Not Flagged
0.158991656734207	Not Flagged
0.163151966626937	Not Flagged
0.314710965435042	Not Flagged
0.7555	Flagged
0.337106078665077	Not Flagged
0.263319427890346	Not Flagged
0.120473778307509	Not Flagged
0.213600715137068	Not Flagged
0.4858873659118	Not Flagged
0.319535756853397	Not Flagged
0.135703814064362	Not Flagged

THANK YOU

PRESENTED BY : KINJAN CHAUHAN