Credit Card Data Analysis

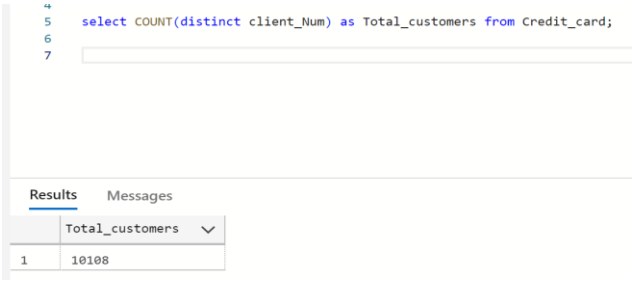
Project Description:

To leverage Azure SQL Database and Azure Data Studio to perform comprehensive data analysis on credit card usage, customer demographics, and financial metrics. The objective is to gain actionable insights that can help the financial institution improve customer satisfaction, manage risks, and optimize their credit card offerings.

Business Requirements:

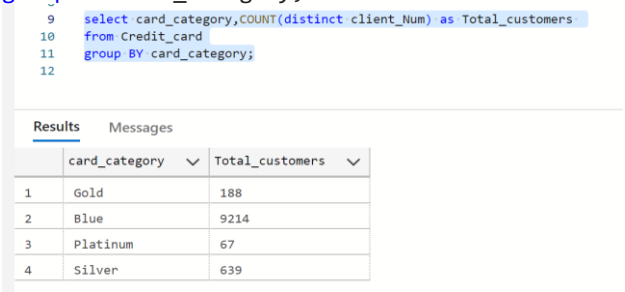
1.Count the Number of Customers

```
select COUNT(distinct client_Num) as Total_customers from Credit_card;
```



2.Customers Distribution by Card Categories

```
select card_category, COUNT(distinct client_Num) as Total_customers from Credit_card
group BY card_category;
```

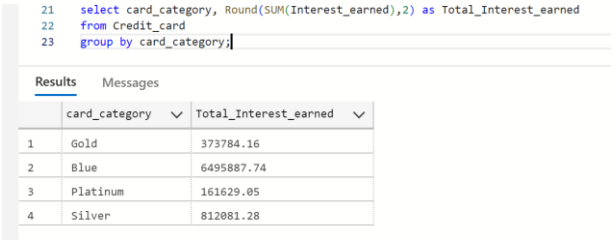


3. Average Annual Fees by Card Category

```
select card_category, AVG(Annual_fees) as Avg_Annualfee from Credit_card
group by card_category;
```

4. Total Interest Earned by Card Category

```
 select card_category, Round (SUM(Interest_earned),2) as Total_Interest_earned from
Credit_card group by card_category;
```



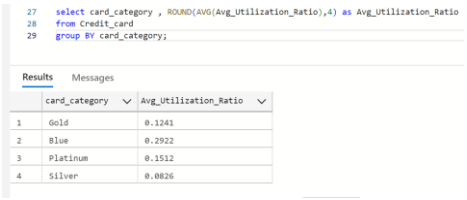
```
21  select card_category, Round(SUM(Interest_earned),2) as Total_Interest_earned
22  from Credit_card
23  group by card_category;
```

Results | Messages

	card_category	Total_Interest_earned
1	Gold	373784.16
2	Blue	6495887.74
3	Platinum	161629.05
4	Silver	812081.28

5. Average Utilization Ratio by Card Category

```
select card_category, ROUND(AVG(Avg_Utilization_Ratio),4) as Avg_Utilization_Ratio from
Credit_card group BY card_category;
```



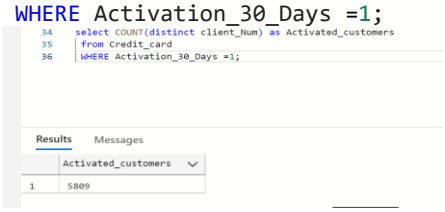
```
27  select card_category , ROUND(AVG(Avg_Utilization_Ratio),4) as Avg_Utilization_Ratio
28  from Credit_card
29  group BY card_category;
```

Results | Messages

	card_category	Avg_Utilization_Ratio
1	Gold	0.1241
2	Blue	0.2922
3	Platinum	0.1512
4	Silver	0.0826

6. Number of Clients Who Activated Within 30 Days

```
  select COUNT(distinct client_Num) as Activated_customers from Credit_card
WHERE Activation_30_Days =1;
```



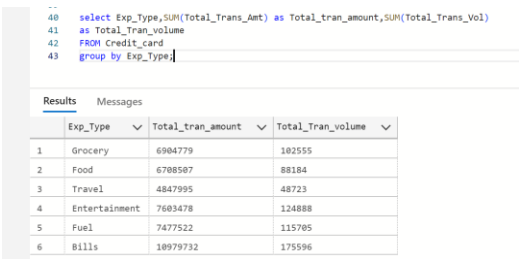
```
34  select COUNT(distinct client_Num) as Activated_customers
35  from Credit_card
36  WHERE Activation_30_Days =1;
```

Results | Messages

	Activated_customers
1	5809

7.Total Transaction Amount and Volume by Expense Type

```
select Exp_Type,SUM(Total_Trans_Amt) as Total_tran_amount,SUM(Total_Trans_Vol)
as Total_Tran_volume FROM Credit_card group by Exp_Type;
```



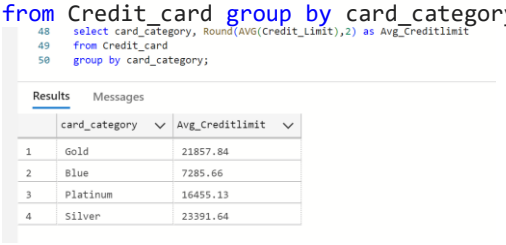
```
40  select Exp_Type,SUM(Total_Trans_Amt) as Total_tran_amount,SUM(Total_Trans_Vol)
41  as Total_Tran_volume
42  FROM Credit_card
43  group by Exp_Type;
```

Results | Messages

	Exp_Type	Total_tran_amount	Total_Tran_volume
1	Grocery	6904779	102555
2	Food	6708507	88184
3	Travel	4847995	48723
4	Entertainment	7603478	124888
5	Fuel	7477522	115705
6	Bills	10979732	175596

8. Average Credit Limit by Card Category

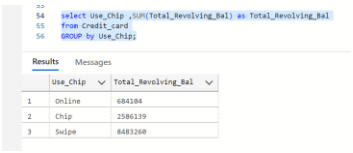
```
select card_category, Round(AVG(Credit_Limit),2) as Avg_Creditlimit
from Credit_card group by card_category;
```



	card_category	Avg_Creditlimit
1	Gold	21857.84
2	Blue	7285.66
3	Platinum	16455.13
4	Silver	23391.64

9. Total Revolving Balance by Use Chip (Chip/Swipe/Online)

```
select Use_Chip, SUM(Total_Revolving_Bal) as Total_Revolving_Bal
from Credit_card GROUP by Use_Chip;
```



	Use_Chip	Total_Revolving_Bal
1	Online	684104
2	Chip	2586139
3	Swipe	8483260

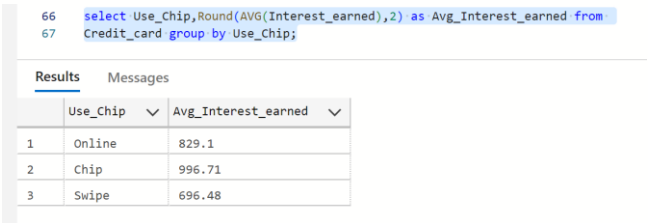
10. Count of Delinquent Accounts by Card Category

```
select card_category, COUNT(Delinquent_Acc) as Delinquent_Acc
from Credit_card where Delinquent_Acc=1 GROUP by card_category;
```

	card_category	Delinquent_Acc
1	Blue	559
2	Gold	12
3	Platinum	4
4	Silver	39

11. Average Interest Earned by Whether the Client Used Chip or Not

```
select Use_Chip,Round(AVG(Interest_earned),2) as Avg_Interest_earned from
Credit_card group by Use_Chip;
```



	Use_Chip	Avg_Interest_earned
1	Online	829.1
2	Chip	996.71
3	Swipe	696.48

12. Top 5 Clients by Total Transaction Amount

```
select top 5 client_Num,Total_Trans_Amt as Total_Trans_Amount from
Credit_card ORDER by Total_Trans_Amt DESC ;
```

```
72  select top 5 client_Num,Total_Trans_Amt as Total_Trans_Amount from
73  Credit_card ORDER by Total_Trans_Amt DESC ;
74
```

Results | Messages

	client_Num	Total_Trans_Amount
1	718140783	18484
2	717642633	17995
3	801036033	17744
4	716004258	17634
5	713758758	17628

13. Total Customer Acquisition Cost by Card Category

```
select card_category, SUM(Customer_Acq_Cost) as Customer_Acq_Cost from Credit_card
GROUP by card_category;
```

```
78  select card_category, SUM(Customer_Acq_Cost) as Customer_Acq_Cost from Credit_card
79  GROUP by card_category;
```

Results | Messages

	card_category	Customer_Acq_Cost
1	Gold	17542
2	Blue	887973
3	Platinum	6570
4	Silver	60851

14. Average Total Transaction Volume for Clients with Platinum Cards

```
select AVG(Total_Trans_Vol) as avg_Total_Trans_Vol from Credit_card
where card_category= 'Platinum';
```

```
83  select AVG(Total_Trans_Vol) as avg_Total_Trans_Vol from Credit_card
84  where card_category= 'Platinum';
```

Results | Messages

	avg_Total_Trans_Vol
1	111

Results grid

15. Average and Total Credit Limit for Clients with a Delinquent Account

```
select Round(AVG(Credit_Limit),2) as avg_Credit_Limit,Round(SUM(Credit_Limit),2) as
Total_Credit_Limit from Credit_card where Delinquent_Acc= 1;
```

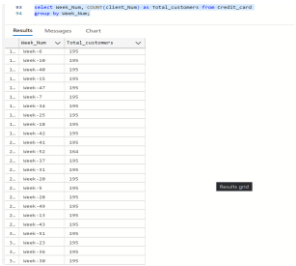
```
88  select Round(AVG(Credit_Limit),2) as avg_Credit_Limit,Round(SUM(Credit_Limit),2) as Total_Credit_Limit from
89  Credit_card where Delinquent_Acc= 1;
```

Results | Messages

	avg_Credit_Limit	Total_Credit_Limit
1	8768.77	5384021.9

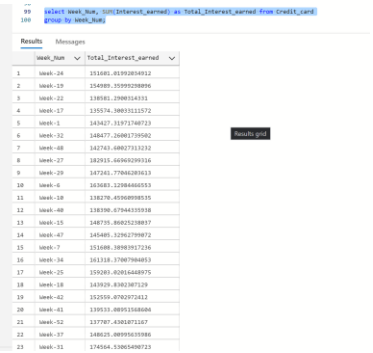
16. Number of Clients by Week Number

```
select Week_Num, COUNT(client_Num) as Total_customers from Credit_card
group by Week_Num;
```



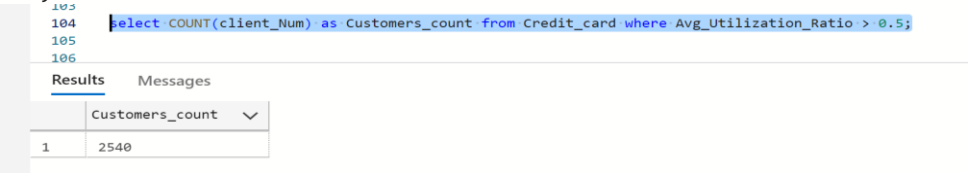
17. Total Interest Earned by Week Number

```
select Week_Num, SUM(Interest_earned) as Total_Interest_earned from Credit_card
group by Week_Num;
```



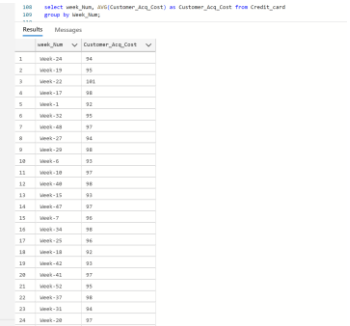
18. Count of Clients with High Utilization Ratio (>0.5)

```
select COUNT(client_Num) as Customers_count from Credit_card where Avg_Utilization_Ratio >
0.5;
```



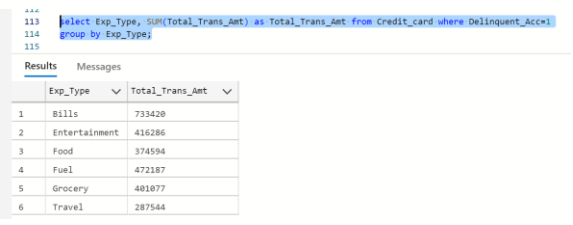
19. Average Customer Acquisition Cost by Week

```
select Week_Num, AVG(Customer_Acq_Cost) as Customer_Acq_Cost from Credit_card
group by Week_Num;
```



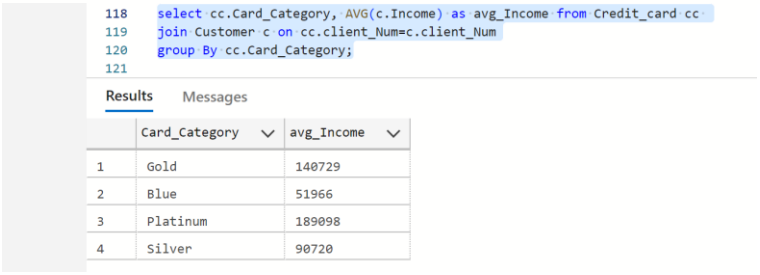
20. Total Transaction Amount by Expense Type for Clients with Delinquent Accounts

```
select Exp_Type, SUM(Total_Trans_Amt) as Total_Trans_Amt from Credit_card where
Delinquent_Acc=1 group by Exp_Type;
```



21. Customer Average Income by Card Category

```
select cc.Card_Category, AVG(c.Income) as avg_Income from Credit_card cc
join Customer c on cc.client_Num=c.client_Num group By cc.Card_Category;
```



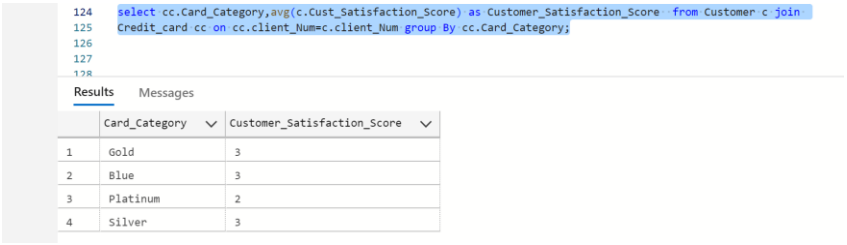
```
118  select cc.Card_Category, AVG(c.Income) as avg_Income from Credit_card cc
119  join Customer c on cc.client_Num=c.client_Num
120  group By cc.Card_Category;
121
```

Results | Messages

	Card_Category	avg_Income
1	Gold	140729
2	Blue	51966
3	Platinum	189098
4	Silver	90720

22. Customer Satisfaction Score by Card Category

```
select cc.Card_Category,avg(c.Cust_Satisfaction_Score) as Customer_Satisfaction_Score  from
Customer c join
Credit_card cc on cc.client_Num=c.client_Num group By cc.Card_Category;
```



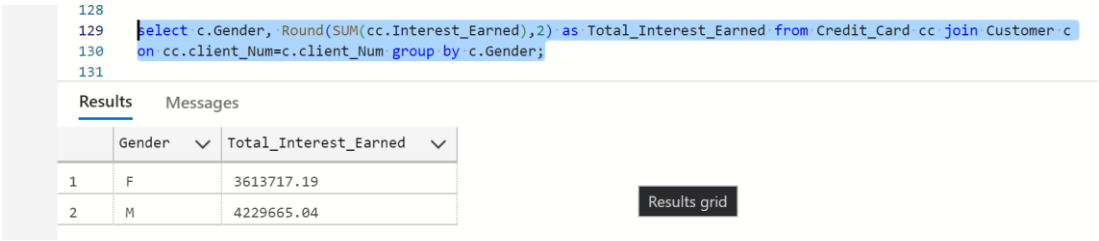
```
124  select cc.Card_Category,avg(c.Cust_Satisfaction_Score) as Customer_Satisfaction_Score from Customer c join
125  Credit_card cc on cc.client_Num=c.client_Num group By cc.Card_Category;
126
127
128
```

Results | Messages

	Card_Category	Customer_Satisfaction_Score
1	Gold	3
2	Blue	3
3	Platinum	2
4	Silver	3

23. Total Interest Earned by Gender

```
select c.Gender, Round(SUM(cc.Interest_Earned),2) as Total_Interest_Earned from Credit_Card
cc join Customer c
on cc.client_Num=c.client_Num group by c.Gender;
```



```
128
129  select c.Gender, Round(SUM(cc.Interest_Earned),2) as Total_Interest_Earned from Credit_Card cc join Customer c
130  on cc.client_Num=c.client_Num group by c.Gender;
131
```

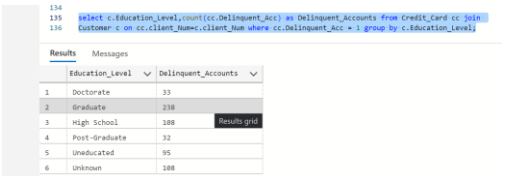
Results | Messages

	Gender	Total_Interest_Earned
1	F	3613717.19
2	M	4229665.04

Results grid

24. Number of Delinquent Accounts by Education Level

```
select c.Education_Level,count(cc.Delinquent_Acc) as Delinquent_Accounts from Credit_Card
cc join
Customer c on cc.client_Num=c.client_Num where cc.Delinquent_Acc = 1 group by
c.Education_Level;
```



```
134
135  select c.Education_Level,count(cc.Delinquent_Acc) as Delinquent_Accounts from Credit_Card cc join
136  Customer c on cc.client_Num=c.client_Num where cc.Delinquent_Acc = 1 group by c.Education_Level;
```

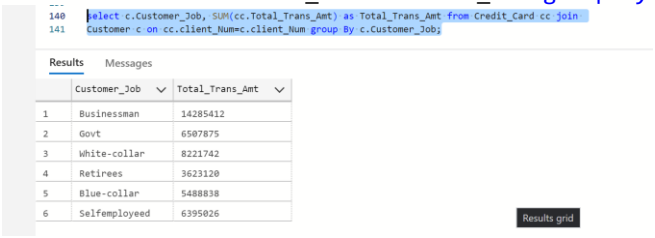
Results | Messages

	Education_Level	Delinquent_Accounts
1	Doctorate	33
2	Graduate	238
3	High School	108
4	Post-Graduate	32
5	Uneducated	95
6	Unknown	108

Results grid

25. Total Transaction Amount by Job Type

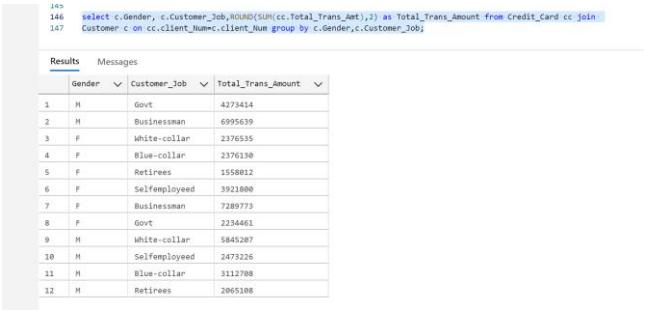
```
select c.Customer_Job, SUM(cc.Total_Trans_Amt) as Total_Trans_Amt from Credit_Card cc join
Customer c on cc.client_Num=c.client_Num group By c.Customer_Job;
```



	Customer_Job	Total_Trans_Amt
1	Businessman	14285412
2	Govt	6507875
3	White-collar	8221742
4	Retirees	3623120
5	Blue-collar	5488838
6	Selfemployeed	6395026

26. Total Transaction amount by Gender and Job Type

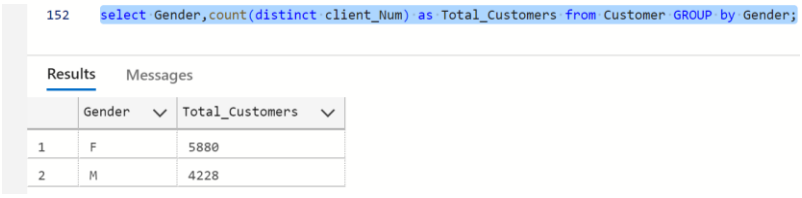
```
select c.Gender, c.Customer_Job,ROUND(SUM(cc.Total_Trans_Amt),2) as Total_Trans_Amount from
Credit_Card cc join Customer c on cc.client_Num=c.client_Num group by
c.Gender,c.Customer_Job;
```



	Gender	Customer_Job	Total_Trans_Amount
1	M	Govt	4273414
2	M	Businessman	6995639
3	F	White-collar	2376535
4	F	Blue-collar	2376130
5	F	Retirees	1558012
6	F	Selfemployeed	3921800
7	F	Businessman	7289773
8	F	Govt	2234461
9	M	White-collar	5845207
10	M	Selfemployeed	2473226
11	M	Blue-collar	3112708
12	M	Retirees	2065108

27. Customers by Gender

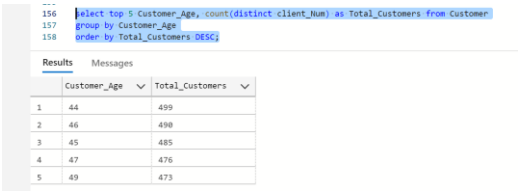
```
select Gender,count(distinct client_Num) as Total_Customers from Customer GROUP by Gender;
```



	Gender	Total_Customers
1	F	5880
2	M	4228

28. Top 5 Customers by Age

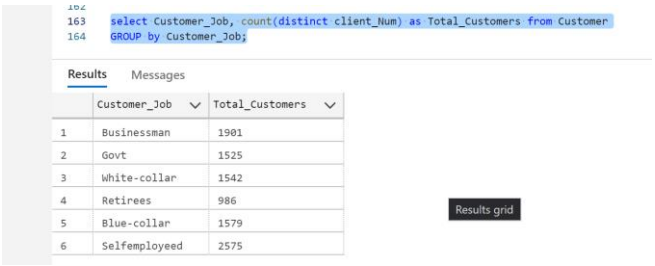
```
select top 5 Customer_Age, count(distinct client_Num) as Total_Customers from Customer
group by Customer_Age order by Total_Customers DESC;
```



	Customer_Age	Total_Customers
1	44	499
2	46	490
3	45	485
4	47	476
5	49	473

29. Customers by job type

```
select Customer_Job, count(distinct client_Num) as Total_Customers from Customer
GROUP by Customer_Job;
```



```
163  select Customer_Job, count(distinct client_Num) as Total_Customers from Customer
164  GROUP by Customer_Job;
```

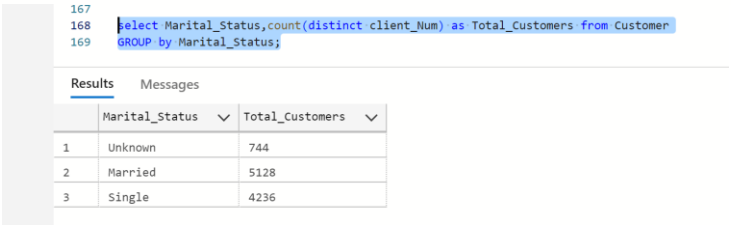
Results | Messages

	Customer_Job	Total_Customers
1	Businessman	1901
2	Govt	1525
3	White-collar	1542
4	Retirees	986
5	Blue-collar	1579
6	Selfemployeed	2575

Results grid

30. Customers by Marital Status

```
select Marital_Status,count(distinct client_Num) as Total_Customers from Customer
GROUP by Marital_Status;
```



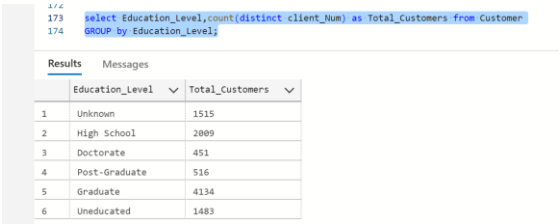
```
167
168  select Marital_Status,count(distinct client_Num) as Total_Customers from Customer
169  GROUP by Marital_Status;
```

Results | Messages

	Marital_Status	Total_Customers
1	Unknown	744
2	Married	5128
3	Single	4236

31. Customers by Education Level

```
select Education_Level,count(distinct client_Num) as Total_Customers from Customer
GROUP by Education_Level;
```



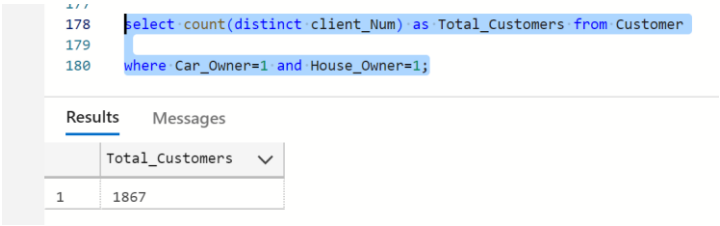
```
173  select Education_Level,count(distinct client_Num) as Total_Customers from Customer
174  GROUP by Education_Level;
```

Results | Messages

	Education_Level	Total_Customers
1	Unknown	1515
2	High School	2009
3	Doctorate	451
4	Post-Graduate	516
5	Graduate	4134
6	Uneducated	1483

32. Number of Customers Having House and Car

```
select count(distinct client_Num) as Total_Customers from Customer where Car_Owner=1 and
House_Owner=1;
```



```
178  select count(distinct client_Num) as Total_Customers from Customer
179
180  where Car_Owner=1 and House_Owner=1;
```

Results | Messages

	Total_Customers
1	1867

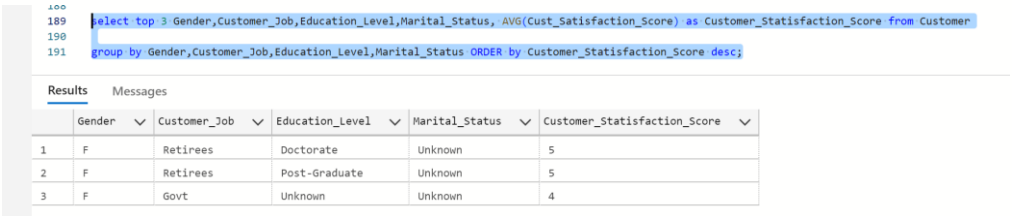
33. Top 5 Customer age Having High Income

```
select top 5 Customer_Age, sum(Income) as Income from Customer group by Customer_Age
ORDER by Income DESC;
```

	Customer_Age	Income
1	50	30021444
2	46	29518581
3	43	27582068
4	44	27401490
5	53	26457699

34. Top 3 Average Customer satisfaction Score by Gender, Job Type, Education, Marital Status

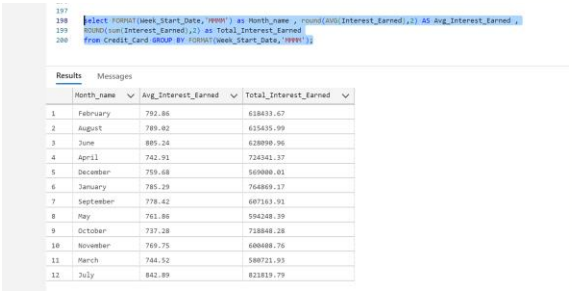
```
select top 3
Gender,Customer_Job,Education_Level,Marital_Status,AVG(Cust_Satisfaction_Score) as
Customer_Statisfaction_Score from Customer group by
Gender,Customer_Job,Education_Level,Marital_Status ORDER by Customer_Statisfaction_Score
desc;
```



	Gender	Customer_Job	Education_Level	Marital_Status	Customer_Statisfaction_Score
1	F	Retirees	Doctorate	Unknown	5
2	F	Retirees	Post-Graduate	Unknown	5
3	F	Govt	Unknown	Unknown	4

35. Monthly average Interest Earned and Total Interest earned

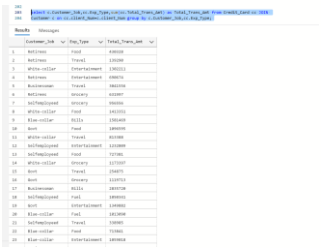
```
select FORMAT(Week_Start_Date,'MMMM') as Month_name , round(AVG(Interest_Earned),2) AS
Avg_Interest_Earned ,ROUND(sum(Interest_Earned),2) as Total_Interest_Earned
from Credit_Card GROUP BY FORMAT(Week_Start_Date,'MMMM');
```



	Month_name	Avg_Interest_Earned	Total_Interest_Earned
1	February	792.86	618433.67
2	August	789.02	615435.99
3	June	805.24	628090.96
4	April	742.91	724341.37
5	December	759.68	569000.01
6	January	785.29	764869.17
7	September	778.42	607163.91
8	May	761.86	594248.39
9	October	737.28	718848.28
10	November	769.75	600408.76
11	March	744.52	580721.93
12	July	842.89	821819.79

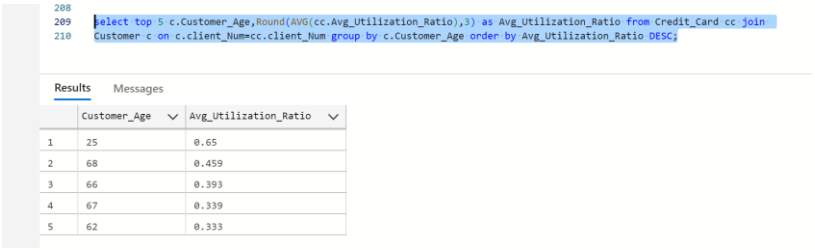
36. Customer Transactions by Expense Type and Job Type

```
select c.Customer_Job,cc.Exp_Type,sum(cc.Total_Trans_Amt) as Total_Trans_Amt from
Credit_Card cc JOIN
Customer c on cc.client_Num=c.client_Num group by c.Customer_Job,cc.Exp_Type;
```



37. Top card Avg_Utilization_Ratio by Customer age

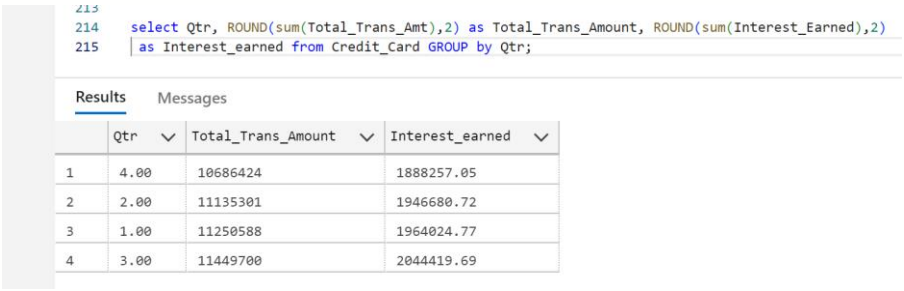
```
select top 5 c.Customer_Age,Round(AVG(cc.Avg_Utilization_Ratio),3) as Avg_Utilization_Ratio
from Credit_Card cc join
Customer c on c.client_Num=cc.client_Num group by c.Customer_Age order by
Avg_Utilization_Ratio DESC;
```



	Customer_Age	Avg_Utilization_Ratio
1	25	0.65
2	68	0.459
3	66	0.393
4	67	0.339
5	62	0.333

38. Transaction Amount and Interest Earned by Quarter

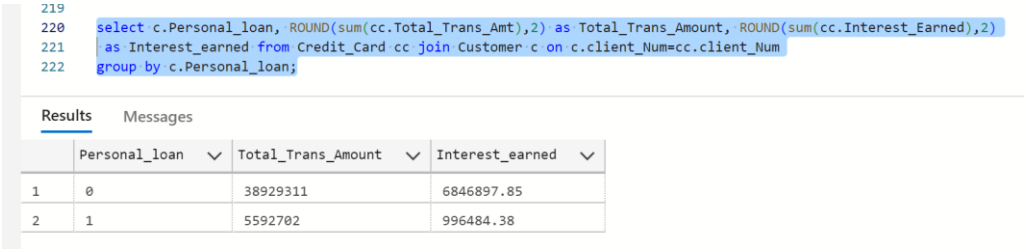
```
select Qtr, ROUND(sum(Total_Trans_Amt),2) as Total_Trans_Amount,
ROUND(sum(Interest_Earned),2) as Interest_earned from Credit_Card GROUP by Qtr;
```



	Qtr	Total_Trans_Amount	Interest_earned
1	4.00	10686424	1888257.05
2	2.00	11135301	1946680.72
3	1.00	11250588	1964024.77
4	3.00	11449700	2044419.69

39. Transaction Amount and Interest Earned by Customer Personal Loan

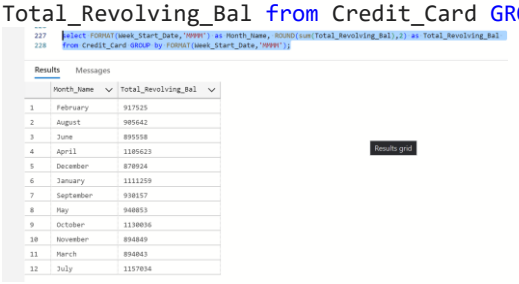
```
select c.Personal_loan, ROUND(sum(cc.Total_Trans_Amt),2) as Total_Trans_Amount,
ROUND(sum(cc.Interest_Earned),2) as Interest_earned from Credit_Card cc join Customer c on
c.client_Num=cc.client_Num group by c.Personal_loan;
```



	Personal_loan	Total_Trans_Amount	Interest_earned
1	0	38929311	6846897.85
2	1	5592702	996484.38

40. Monthly Revolving Balance Distribution

```
select FORMAT(Week_Start_Date,'MMMM') as Month_Name, ROUND(sum(Total_Revolving_Bal),2) as
Total_Revolving_Bal from Credit_Card GROUP by FORMAT(Week_Start_Date,'MMMM');
```



	Month_Name	Total_Revolving_Bal
1	February	917525
2	August	905642
3	June	895558
4	April	1105623
5	December	870924
6	January	1111259
7	September	930157
8	May	940853
9	October	1130036
10	November	894849
11	March	894043
12	July	1157034