

An abstract graphic on the left side of the slide, featuring a series of parallel, slightly wavy vertical lines in a light blue color. These lines are connected by horizontal segments, creating a circuit-like or data-path aesthetic. Small circular nodes are placed at various points along these lines.

# Customer Credit Card Transactions:

## A Data Analysis Project

*"Unveiling Patterns and Trends in Spending"*

Report By:

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# Introduction

This report provides an analysis of credit card spending behavior based on a dataset of credit card transactions. The insights were generated using a dashboard created in Power BI, which connects to an SQL Server Management Studio containing the uploaded CSV file. The analysis includes various dimensions such as revenue, interest earned, transaction amounts, customer demographics, and spending patterns.



# Project Objective

To develop a comprehensive credit card weekly dashboard that provide real-time insights into key performance metrics and trends, enabling stakeholders to monitor and analyze credit card operations effectively.

## Tools Utilized

- Microsoft Excel
- SQL
- Power Bi

## Tools and Methodology

- A CSV file containing the data was used as the primary data source.
- The CSV file was uploaded to an SQL Server Management Studio to manage and manipulate the data efficiently.
- DAX queries were employed within Power BI to generate new columns and measures, providing deeper insights and refined data visualization.
- Power BI was utilized to create the dashboard for visualizing key insights.

# Excel CSV Files Example

To illustrate the data used in the analysis, the following is a sample of the CSV file uploaded to SQL Server. These files contains credit card transaction data, which is used for analyses and visualizations in the Power BI dashboard.

These tables provides a snapshot of the types of data included in the CSV file, such as transaction details, customer demographics, and expenditure categories.

credit\_card.csv

Client_Num	Card_Category	Annual_Fees	Activation_30_Days	Customer_Acq_Cost	Week_Start_Date	Week_Num	Qtr	current_year	Credit_Limit	Total_Revolving_Bal	Total_Trans_Amt	Total_Trans_Vol	Avg_Utilization_Ratio	Use_Chip	Exp_Type	Interest_Earned	Delinquent_Amt
708082083	Blue	200	0	87	1/1/2023	Week-1	Q1	2023	3544	1661	15149	111	0.640	Chip	Travel	4393.21	0
708082383	Blue	445	1	108	1/1/2023	Week-1	Q1	2023	3421	2517	992	21	0.736	Swipe	Entertainment	69.44	0
708084558	Blue	140	0	106	1/1/2023	Week-1	Q1	2023	8238	1771	1447	23	0.214	Chip	Bills	202.58	0
708085458	Blue	250	1	150	1/1/2023	Week-1	Q1	2023	5438.3	0	3940	82	0	Online	Grocery	236.4	0
708086958	Blue	320	1	106	1/1/2023	Week-1	Q1	2023	3128	749	4369	59	0.239	Swipe	Fuel	3004.87	1
708095133	Blue	100	0	94	1/1/2023	Week-1	Q1	2023	33304	1833	1448	29	0.055	Swipe	Bills	275.12	0
708098133	Blue	225	1	75	1/1/2023	Week-1	Q1	2023	2834	1418	1598	39	0.5	Swipe	Bills	159.8	1
708099183	Blue	400	1	75	1/1/2023	Week-1	Q1	2023	5723	1873	2732	83	0.337	Swipe	Grocery	409.8	0
708105513	Blue	200	1	64	1/1/2023	Week-1	Q1	2023	2679	2277	4943	85	0.85	Chip	Food	198.6	0
708103608	Platinum	95	1	80	1/1/2023	Week-1	Q1	2023	11898	2517	15798	128	0.212	Chip	Grocery	3791.52	0
708104658	Blue	455	1	118	1/1/2023	Week-1	Q1	2023	1438.3	890	2928	48	0.619	Swipe	Fuel	732	0
708108333	Blue	485	0	86	1/1/2023	Week-1	Q1	2023	3590	0	1507	32	0	Swipe	Entertainment	150.7	0
708112008	Blue	440	1	86	1/1/2023	Week-1	Q1	2023	23350	1049	1661	32	0.045	Swipe	Grocery	485.08	0
708113208	Blue	300	1	149	1/1/2023	Week-1	Q1	2023	1688	0	4375	89	0	Chip	Fuel	525	0
708117933	Blue	360	0	44	1/1/2023	Week-1	Q1	2023	1880	0	2469	34	0	Chip	Bills	419.73	1
708119658	Blue	340	0	44	1/1/2023	Week-1	Q1	2023	12886	1084	2519	53	0.081	Swipe	Bills	554.18	0
708121908	Blue	405	0	71	1/1/2023	Week-1	Q1	2023	22917	0	2043	40	0	Swipe	Grocery	265.85	0
708123033	Silver	355	0	78	1/1/2023	Week-1	Q1	2023	11463	0	14511	105	0	Swipe	Fuel	2047.31	0
708125733	Blue	220	0	69	1/1/2023	Week-1	Q1	2023	1438.3	0	4311	77	0	Swipe	Entertainment	1207.08	0
708128733	Blue	125	1	105	1/1/2023	Week-1	Q1	2023	1814	0	5014	99	0	Swipe	Entertainment	1303.64	0
708129933	Blue	350	1	77	1/1/2023	Week-1	Q1	2023	2072	1544	4210	64	0.745	Chip	Entertainment	884.1	0
708132783	Blue	250	1	92	1/1/2023	Week-1	Q1	2023	16413	1179	3929	71	0.072	Swipe	Food	785.8	1
708134283	Blue	125	1	101	1/1/2023	Week-1	Q1	2023	3131	629	1483	31	0.201	Swipe	Food	311.43	0
708136958	Blue	510	1	73	1/1/2023	Week-1	Q1	2023	2616	801	4655	68	0.306	Swipe	Entertainment	805.15	0
708139833	Blue	440	0	111	1/1/2023	Week-1	Q1	2023	6393	0	2323	44	0	Swipe	Grocery	441.37	0
708145908	Blue	320	0	78	1/1/2023	Week-1	Q1	2023	4906	2185	3999	71	0.445	Swipe	Bills	959.76	0
708147108	Blue	320	0	112	1/1/2023	Week-1	Q1	2023	21084	2517	2309	71	0.119	Swipe	Travel	277.08	0
708148158	Blue	175	0	73	1/1/2023	Week-1	Q1	2023	1827	0	4207	86	0	Swipe	Fuel	925.54	0
708151008	Blue	440	1	86	1/1/2023	Week-1	Q1	2023	6250	644	2433	41	0.103	Swipe	Fuel	486.6	0
708152358	Blue	335	1	101	1/1/2023	Week-1	Q1	2023	18532	3664	8019	57	0.09	Swipe	Food	721.71	0

customer.csv

Client_Num	Customer_Age	Gender	Dependent_Count	Education_Level	Marital_Status	state_cd	Zipcode	Car_Owner	House_Owner	Personal_loan	contact	Customer_Job	Income	Curt_Satisfaction_Score
708082083	24	F		1 Uneducated	Single	FL	91750 no	yes	no	no	unknown	Businessman	202326	3
708082383	62	F		0 Unknown	Married	NJ	91750 no	no	no	no	cellular	Selfemployed	3225	3
708084558	32	F		1 Unknown	Married	NJ	91750 yes	no	no	no	unknown	Selfemployed	14235	2
708085458	38	M		2 Uneducated	Single	NY	91750 no	no	no	no	cellular	Blue-collar	45683	1
708086958	48	M		4 Graduate	Single	TX	91750 yes	yes	no	no	cellular	Businessman	59279	1
708095133	33	F		1 High School	Single	NY	91750 no	yes	no	no	cellular	Selfemployed	14254	3
708098133	34	F		3 Graduate	Single	CA	91750 yes	no	no	no	telephone	Selfemployed	14975	2
708099183	34	F		2 Uneducated	Single	CA	91750 no	no	no	no	cellular	Retirees	31982	2
708100533	48	M		2 High School	Married	NJ	91750 yes	no	no	no	telephone	Businessman	86668	2
708103608	53	F		1 Graduate	Married	NJ	91750 yes	yes	no	no	cellular	Businessman	22196	1
708104658	31	F		0 Post-Graduate	Single	CA	91750 no	yes	no	no	telephone	Businessman	33625	2
708108133	34	F		4 Graduate	Single	NY	91750 no	no	no	no	cellular	Selfemployed	14975	3
708112008	53	F		2 Graduate	Single	NJ	91750 yes	yes	no	no	cellular	Selfemployed	14975	2
708113208	36	M		1 High School	Single	NJ	91750 yes	no	no	no	telephone	White-collar	59416	3
708117933	49	F		4 Graduate	Married	CA	91750 no	yes	no	no	unknown	Retirees	28122	1
708119658	53	F		2 Graduate	Single	FL	91750 yes	no	no	no	cellular	Govt	29021	3
708121908	49	F		1 Graduate	Married	TX	91750 no	no	no	no	unknown	Selfemployed	20632	1
708123033	47	F		5 Graduate	Married	FL	91750 no	no	no	no	cellular	Businessman	172101	2
708125733	43	F		4 Graduate	Single	FL	91750 no	no	no	no	cellular	Retirees	57168	2
708128733	47	M		3 Graduate	Married	NY	91750 no	no	no	no	cellular	Govt	89554	2
708129933	34	F		3 Uneducated	Single	TX	91750 yes	yes	yes	yes	telephone	Blue-collar	53762	1
708132783	37	F		5 Unknown	Married	NJ	91750 yes	yes	no	no	cellular	Selfemployed	45476	3
708134283	63	M		0 Graduate	Single	TX	91750 yes	yes	yes	yes	cellular	Selfemployed	14975	2
708136958	55	M		2 Doctorate	Married	MA	91750 yes	yes	no	no	cellular	Retirees	72878	2
708139833	38	F		1 Unknown	Single	NJ	91750 no	no	no	no	cellular	Businessman	25667	0
708145908	40	M		3 Graduate	Single	MA	91750 no	yes	no	no	cellular	Blue-collar	47224	1
708147108	55	F		0 Graduate	Single	NY	91750 yes	no	no	no	unknown	White-collar	25341	2
708148158	33	M		2 Doctorate	Single	NY	91750 no	yes	yes	yes	cellular	Blue-collar	53644	3
708151008	54	F		3 Uneducated	Married	CA	91750 no	yes	no	no	cellular	Govt	27423	2
708152358	46	M		3 Graduate	Married	NY	91750 yes	yes	no	no	cellular	Blue-collar	110014	2
708153558	44	M		4 Graduate	Unknown	IA	91750 no	no	no	no	telephone	Businessman	109186	0
708154833	40	F		3 Graduate	Married	NJ	91750 yes	yes	no	no	cellular	Govt	25833	2
708155733	44	F		3 Graduate	Married	CA	91750 yes	yes	no	no	unknown	Selfemployed	11345	2
708158133	51	F		2 Uneducated	Single	NY	91750 yes	no	no	no	cellular	Selfemployed	23215	2
708160008	60	M		0 Graduate	Single	CA	91750 no	no	no	no	cellular	Businessman	103581	3
708161233	49	F		2 Unknown	Single	TX	91750 yes	yes	no	no	cellular	Selfemployed	44555	3
708162558	43	F		5 Graduate	Married	TX	91750 no	yes	no	no	cellular	Selfemployed	12381	2
708163758	54	M		1 Graduate	Single	NY	91750 no	yes	no	no	unknown	White-collar	123809	1
708170508	32	F		0 Graduate	Married	FL	91750 yes	no	no	no	unknown	Selfemployed	14975	1

# Loading CSV Data into SQL Server

To efficiently manage and analyze the credit card transaction data, the CSV file is loaded into SQL Server. This process involves creating the necessary database and tables, importing the data, and preparing it for connection with Power BI. Below are the steps involved:

1. Create Database and Tables
2. Import Data from CSV File
3. Connect to Power BI

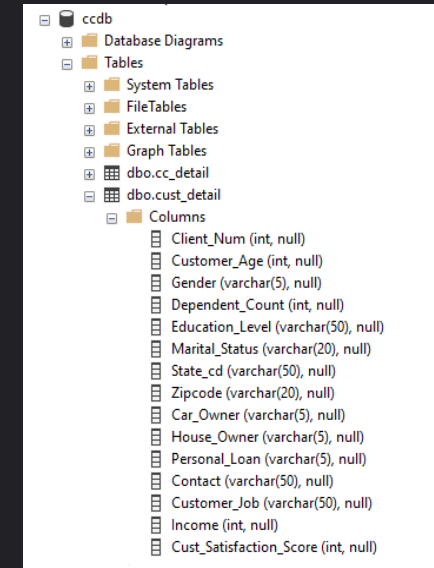
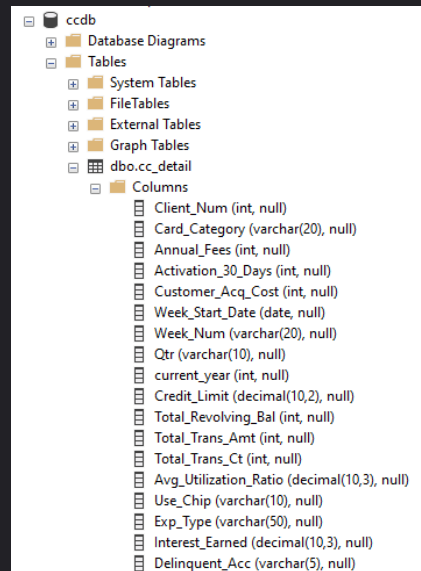
## • Create Database and Tables

First, we create a new database in SQL Server to store the credit card transaction data. Then, we define the structure of the tables according to the schema of the CSV file. The following SQL queries are used to create the database and tables:

```
CREATE database ccdb;

CREATE TABLE cc_detail (
    Client_Num INT,
    Card_Category VARCHAR(20),
    Annual_Fees INT,
    Activation_30_Days INT,
    Customer_Acq_Cost INT,
    Week_Start_Date DATE,
    Week_Num VARCHAR(20),
    Qtr VARCHAR(10),
    current_year INT,
    Credit_Limit DECIMAL(10,2),
    Total_Revolving_Bal INT,
    Total_Trans_Amt INT,
    Total_Trans_Ct INT,
    Avg_Utilization_Ratio DECIMAL(10,3),
    Use_Chip VARCHAR(10),
    Exp_Type VARCHAR(50),
    Interest_Earned DECIMAL(10,3),
    Delinquent_Acc VARCHAR(5)
);

CREATE TABLE cust_detail (
    Client_Num INT,
    Customer_Age INT,
    Gender VARCHAR(5),
    Dependent_Count INT,
    Education_Level VARCHAR(50),
    Marital_Status VARCHAR(20),
    State_cd VARCHAR(50),
    Zipcode VARCHAR(20),
    Car_Owner VARCHAR(5),
    House_Owner VARCHAR(5),
    Personal_Loan VARCHAR(5),
    Contact VARCHAR(50),
    Customer_Job VARCHAR(50),
    Income INT,
    Cust_Satisfaction_Score INT
);
```



• Import Data from CSV Files

After creating the database and tables, the next step is to import the data from the CSV file into the SQL Server tables. This can be done using SQL Server Management Studio (SSMS) or T-SQL commands. An example T-SQL command for importing data is:

```
BULK INSERT cc_detail
FROM 'C:\Users\sohai\Downloads\POWER BI CONTENT\Dashboard Project 7\credit_card.csv'
WITH (
    FIELDTERMINATOR = ',',
    ROWTERMINATOR = '\n',
    FIRSTROW = 2
);

select * from cc_detail

BULK INSERT cust_detail
FROM 'C:\Users\sohai\Downloads\POWER BI CONTENT\Dashboard Project 7\customer.csv'
WITH (
    FIELDTERMINATOR = ',',
    ROWTERMINATOR = '\n',
    FIRSTROW = 2
);

select * from cust_detail
```

cc\_detail

Chrt_Num	Card_Category	Annual_Fees	Activation_It_Den	Customer_Acc_Cnt	Week_Start_Date	Week_Num	Dr	Current_Pers	Card_Lmt	Total_Revolving_Bal	Total_Trans_Amt	Total_Trans_Ct	Has_Credit_Limitation_Plan	Use_Chg	Exp_Type	Home_Banned	Delinquency_Acc
1	700042001	Blue	205	0	2023-01-01	Week-1	Q1	2023	5345.00	0	3253	85	0.000	Swipe	Food	325.300	0
2	700042401	Blue	250	0	2023-01-01	Week-1	Q1	2023	4830.00	1105	2245	51	0.077	Swipe	Blk	427.120	0
3	700044001	Blue	450	1	2023-01-01	Week-1	Q1	2023	2793.00	1017	3465	12	0.543	Swipe	Food	303.900	0
4	700046001	Gold	450	0	2023-01-01	Week-1	Q1	2023	19671.00	824	13806	124	0.047	Swipe	Travel	2503.440	0
5	700046201	Silver	200	1	2023-01-01	Week-1	Q1	2023	29937.00	0	14653	109	0.000	Online	Blk	1932.180	0
6	700046701	Blue	300	0	2023-01-01	Week-1	Q1	2023	4844.00	1076	1489	48	0.320	Swipe	Fuel	251.130	0
7	700047101	Blue	475	1	2023-01-01	Week-1	Q1	2023	7562.00	1807	4065	85	0.259	Chip	Fuel	243.900	0
8	700045401	Blue	125	1	2023-01-01	Week-1	Q1	2023	5525.00	1023	4057	81	0.330	Swipe	Food	1403.530	0
9	700045701	Blue	325	1	2023-01-01	Week-1	Q1	2023	2960.00	1073	5171	85	0.021	Swipe	Fuel	1241.040	0
10	700045621	Blue	200	0	2023-01-01	Week-1	Q1	2023	3761.00	1710	3240	65	0.405	Swipe	Fuel	550.000	0
11	700045021	Blue	150	1	2023-01-01	Week-1	Q1	2023	2007.00	1279	4321	75	0.622	Chip	Food	1123.480	0
12	700046801	Blue	355	0	2023-01-01	Week-1	Q1	2023	1066.00	0	2312	35	0.000	Swipe	Food	184.960	0
13	700047001	Blue	140	0	2023-01-01	Week-1	Q1	2023	6080.00	2146	2586	52	0.202	Swipe	Entertainment	422.540	0
14	700046901	Blue	335	1	2023-01-01	Week-1	Q1	2023	2020.00	1377	4014	86	0.679	Chip	Entertainment	1053.500	0
15	70071031	Silver	185	1	2023-01-01	Week-1	Q1	2023	10000.00	1843	3464	47	0.122	Online	Blk	831.360	0
16	700047001	Blue	150	1	2023-01-01	Week-1	Q1	2023	2714.00	1476	3540	89	0.540	Chip	Fuel	946.720	0
17	700710901	Blue	355	1	2023-01-01	Week-1	Q1	2023	94510.00	0	3734	80	0.000	Swipe	Fuel	522.760	0
18	700047010	Blue	375	0	2023-01-01	Week-1	Q1	2023	1762.00	0	1504	35	0.000	Swipe	Blk	279.720	0
19	700047401	Blue	325	0	2023-01-01	Week-1	Q1	2023	1420.00	0	3948	75	0.000	Swipe	Food	285.360	0
20	700048101	Blue	420	1	2023-01-01	Week-1	Q1	2023	4128.00	2239	13505	116	0.305	Swipe	Fuel	1620.620	1
21	700046601	Blue	250	0	2023-01-01	Week-1	Q1	2023	12045.00	1740	4504	86	0.145	Swipe	Blk	1123.320	1
22	700048101	Blue	360	1	2023-01-01	Week-1	Q1	2023	9620.00	1547	647	15	0.274	Swipe	Blk	176.070	1
23	700049201	Silver	355	1	2023-01-01	Week-1	Q1	2023	13600.00	1100	3118	76	0.087	Chip	Entertainment	841.860	1
24	700047621	Blue	350	1	2023-01-01	Week-1	Q1	2023	4011.00	2493	3037	79	0.107	Swipe	Entertainment	1223.280	1
25	700048301	Blue	150	1	2023-01-01	Week-1	Q1	2023	27380.00	1260	2754	0	0.046	Online	Blk	247.980	1
26	700049301	Blue	200	0	2023-01-01	Week-1	Q1	2023	5643.00	1080	1215	22	0.030	Swipe	Travel	230.560	1
27	700048601	Blue	200	0	2023-01-01	Week-1	Q1	2023	11740.00	788	1178	27	0.067	Swipe	Travel	250.160	1
28	700049201	Blue	125	0	2023-01-01	Week-1	Q1	2023	8184.00	0	1756	49	0.000	Swipe	Fuel	456.960	1
29	700049401	Blue	245	0	2023-01-01	Week-1	Q1	2023	7052.00	609	704	16	0.077	Swipe	Travel	707.120	1
30	700049601	Blue	125	0	2023-01-01	Week-1	Q1	2023	20790.00	1059	8038	90	0.051	Swipe	Fuel	2009.500	0
31	700049101	Blue	175	0	2023-01-01	Week-1	Q1	2023	1776.00	1706	4940	84	0.594	Swipe	Grocery	1037.400	0
32	700047621	Blue	345	0	2023-01-01	Week-1	Q1	2023	3006.00	0	4120	81	0.000	Swipe	Food	371.010	0
33	700130001	Blue	245	1	2023-01-01	Week-1	Q1	2023	2044.00	2116	2110	43	0.059	Swipe	Food	274.300	0
34	700140001	Blue	100	1	2023-01-01	Week-1	Q1	2023	10030.00	1300	1070	40	0.246	Swipe	Fuel	298.300	0
35	700140001	Blue	340	1	2023-01-01	Week-1	Q1	2023	10031.00	0	1792	29	0.000	Swipe	Fuel	394.240	0
36	700139001	Blue	300	0	2023-01-01	Week-1	Q1	2023	4110.00	1473	3007	70	0.300	Online	Travel	1020.070	0
37	700132001	Blue	290	1	2023-01-01	Week-1	Q1	2023	1622.00	0	2041	36	0.000	Swipe	Fuel	403.380	0
38	70004401	Blue	290	1	2023-01-01	Week-1	Q1	2023	1548.00	0	4420	71	0.000	Chip	Blk	707.200	0
39	700150001	Blue	250	1	2023-01-01	Week-1	Q1	2023	5040.00	1391	670	11	0.107	Swipe	Travel	122.040	0
40	700131701	Silver	250	0	2023-01-01	Week-1	Q1	2023	12444.00	1843	3725	60	0.087	Swipe	Fuel	400.750	0

Data Output

Messages

Notifications

COPY 10108

Query returned successfully in 82 msec.

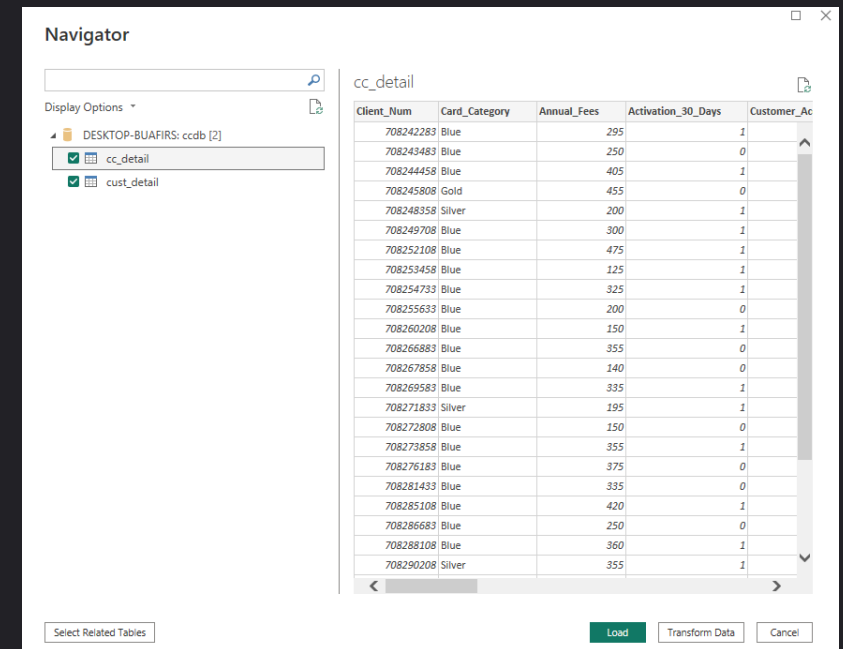
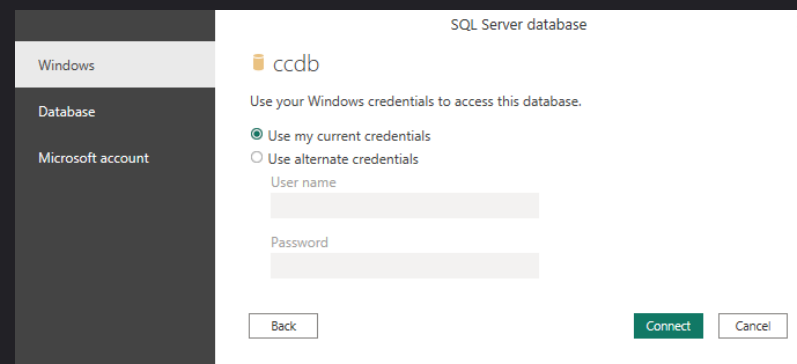
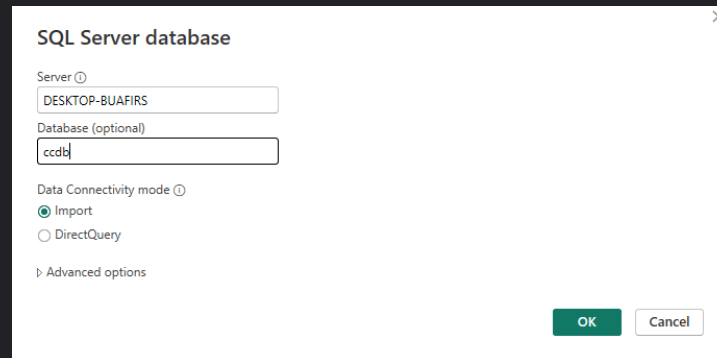
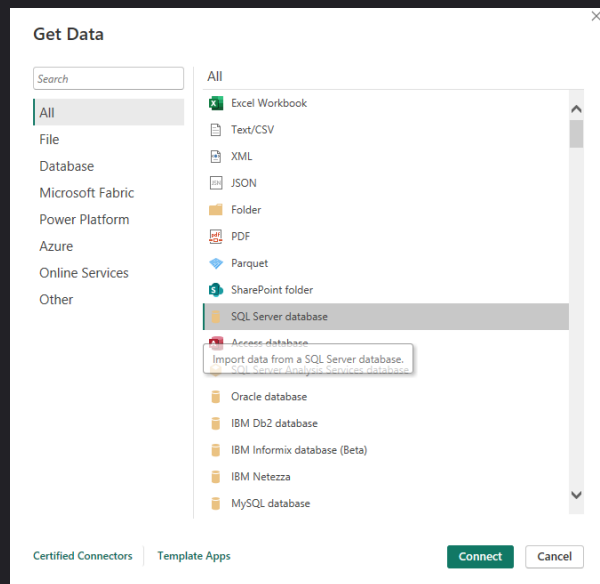
cust\_detail

Chrt_Num	Customer_Age	Gender	Dependent_Count	Education_Level	Marital_Status	State_Ord	Depends	Cap_Overse	House_Overse	Personal_Loan	Contact	Customer_Job	Income	Cost_Satisfaction_Score	
1	700002001	24	F	1	Uneducated	Single	FL	91750	no	yes	no	Businessman	202326	3	
2	700002001	62	F	0	Unknown	Married	NJ	91750	no	no	no	cellular	Selfemployed	5225	2
3	700004501	32	F	1	Unknown	Married	NJ	91750	yes	no	no	unknown	Selfemployed	14225	2
4	700004501	38	M	2	Uneducated	Single	NY	91750	no	no	no	cellular	Blue-collar	45683	1
5	700005901	49	M	4	Graduate	Single	TX	91750	yes	yes	yes	cellular	Businessman	95079	1
6	700005133	33	F	1	High School	Single	NY	91750	no	yes	no	cellular	Selfemployed	14254	3
7	70009133	34	F	3	Graduate	Single	CA	91750	yes	no	no	cellular	Selfemployed	14975	2
8	70009133	34	F	2	Uneducated	Single	CA	91750	yes	yes	yes	cellular	Businessman	371902	2
9	700105001	48	M	2	High School	Married	NJ	91750	yes	no	no	cellular	Businessman	86668	2
10	700105001	53	F	1	Graduate	Married	NJ	91750	yes	no	no	cellular	Businessman	223195	1
11	700104501	31	F	0	Post Graduate	Single	CA	91750	no	yes	no	cellular	Businessman	33625	2
12	700102001	34	F	4	Graduate	Single	NY	91750	no	no	no	cellular	Selfemployed	14975	3
13	700110001	51	F	2	Graduate	Single	NJ	91750	yes	yes	yes	cellular	Selfemployed	14975	2
14	700113201	36	M	1	High School	Single	NJ	91750	yes	no	no	cellular	White-collar	59416	3
15	700117011	49	F	4	Graduate	Married	CA	91750	no	yes	no	cellular	Businessman	28122	1
16	700119601	53	F	2	Graduate	Single	FL	91750	yes	no	no	cellular	Govt	29021	1
17	700121001	49	F	1	Graduate	Married	TX	91750	no	no	no	unknown	Selfemployed	20532	3
18	700120001	47	F	5	Graduate	Married	FL	91750	yes	yes	yes	cellular	Businessman	172101	2
19	700125731	43	F	4	Graduate	Single	FL	91750	no	no	no	cellular	Retirees	57168	2
20	700125731	47	M	3	Graduate	Married	NY	91750	no	no	no	cellular	Retirees	89594	4
21	700125901	34	F	3	Uneducated	Single	TX	91750	yes	yes	yes	cellular	Blue-collar	52762	1
22	700132781	37	F	5	Unknown	Married	NJ	91750	yes	yes	no	cellular	Selfemployed	45476	3
23	700134201	63	M	0	Graduate	Single	TX	91750	yes	yes	yes	cellular	Selfemployed	14975	2
24	700136901	55	M	2	Doctorate	Married	MO	91750	yes	yes	yes	cellular	Retirees	72878	2
25	700139001	38	F	1	Unknown	Single	NY	91750	no	no	no	cellular	Businessman	25667	3
26	700140001	40	M	3	Graduate	Single	MA	91750	no	yes	no	cellular	White-collar	47224	1
27	700147101	55	F	0	Graduate	Single	NY	91750	yes	no	no	unknown	White-collar	25341	2
28	700148101	33	M	2	Doctorate	Single	NY	91750	no	yes	yes	cellular	Blue-collar	53644	3
29	700151001	54	F	1	Uneducated	Married	CA	91750	no	yes	no	cellular	Govt	27423	2
30	700152001	46	M	3	Graduate	Married	NY	91750	yes	yes	no	cellular	Blue-collar	110014	2
31	700153001	44	M	4	Graduate	Unknown	IA	91750	no	no	no	cellular	Businessman	109186	2
32	700154001	40	F	3	Graduate	Married	NJ	91750	yes	yes	no	cellular	Govt	25035	2
33	700157001	44	F	3	Graduate	Married	CA	91750	yes	yes	yes	unknown	Selfemployed	11345	2
34	700158133	51	F	2	Uneducated	Single	NY	91750	yes	no	no	cellular	Selfemployed	23215	2
35	700160001	60	M	0	Graduate	Single	CA	91750	no	no	no	cellular	Businessman	102081	3
36	700161131	49	F	2	Unknown	Single	TX	91750	yes	yes	yes	cellular	Selfemployed	44555	3
37	700162001	43	F	5	Graduate	Married	TX	91750	no	yes	no	cellular	Selfemployed	12381	2
38	700162701	54	M	1	Single	Single	NY	91750	no	yes	yes	cellular	White-collar	123009	1
39	700170001	32	F	0	Graduate	Married	FL	91750	yes	no	no	unknown	Selfemployed	14975	1
40	700171001	52	F	3	Graduate	Married	NY	91750	no	yes	no	unknown	Businessman	30596	1



- ## Connect Power BI

Once the data is successfully imported into SQL Server, it can be connected to Power BI. In Power BI Desktop, use the SQL Server connector to establish a connection, select the relevant tables, and start building the dashboard and reports based on the imported data.



# DAX Queries Implementation and Explanation

To enhance our analysis and provide more granular insights into credit card spending behavior, we used Data Analysis Expressions (DAX) in Power BI. DAX allows us to create calculated columns and measures that summarize, filter, and manipulate data dynamically. The following DAX queries have been implemented to derive key metrics for our dashboard:

```
AgeGroup = SWITCH(  
    TRUE(),  
    'cust_detail'[Customer_Age] < 30, "20-30",  
    'cust_detail'[Customer_Age] >= 30 && 'cust_detail'[Customer_Age] < 40, "30-40",  
    'cust_detail'[Customer_Age] >= 40 && 'cust_detail'[Customer_Age] < 50, "40-50",  
    'cust_detail'[Customer_Age] >= 50 && 'cust_detail'[Customer_Age] < 60, "50-60",  
    'cust_detail'[Customer_Age] >= 60, "60+",  
    "unknown"  
)
```

*Purpose: Categorizes customers into age groups to analyze spending patterns by age demographic.*

```
1 IncomeGroup = SWITCH(  
2     TRUE(),  
3     'cust_detail'[Income] < 35000, "Low",  
4     'cust_detail'[Income] >= 35000 && 'cust_detail'[Income] < 70000, "Med",  
5     'cust_detail'[Income] > 70000, "High",  
6     "unknown"  
7 )
```

*Purpose: Segments customers by income levels to assess revenue contributions from different income brackets.*

```
1 Revenue = 'cc_detail'[Annual_Fees] + 'cc_detail'[Total_Trans_Amt] + 'cc_detail'[Interest_Earned]
```

*Purpose: Calculates total revenue generated from fees, transactions, and interest to measure overall financial performance.*

```
1 Current_week_revenue = CALCULATE(  
2     SUM('cc_detail'[Revenue]),  
3     FILTER(  
4         ALL('cc_detail'),  
5         'cc_detail'[Week_Num2] = MAX('cc_detail'[Week_Num2]))))
```

*Purpose: Computes the total revenue for the current week to analyze recent spending trends and patterns.*

```
1 Previous_week_revenue = CALCULATE(  
2     SUM('cc_detail'[Revenue]),  
3     FILTER(  
4         ALL('cc_detail'),  
5         'cc_detail'[Week_Num2] = MAX('cc_detail'[Week_Num2])-1))
```

*Purpose: Determines the revenue for the previous week, allowing for week-over-week performance comparisons.*

**These DAX queries enable dynamic analysis and visualization, making it easier to identify trends, patterns, and anomalies in credit card spending behaviors across different customer segments.**

# Key Insights

## 1. Overview Metrics

- **Revenue:** Total revenue from credit card transactions is reported at 55 million.
- **Interest Earned:** The total interest earned from credit card transactions amounts to 7.8 million.
- **Income:** The total income from all credit card-related activities stands at 576 million.
- **Customer Happiness Score:** The average customer happiness score is recorded at 3.19.

Revenue

55M

Interest Earned

7.8M

Income

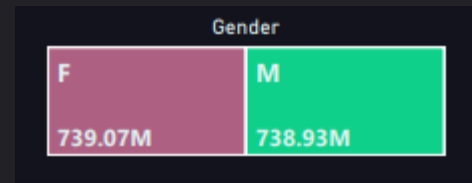
576M

Customer Happiness  
Score

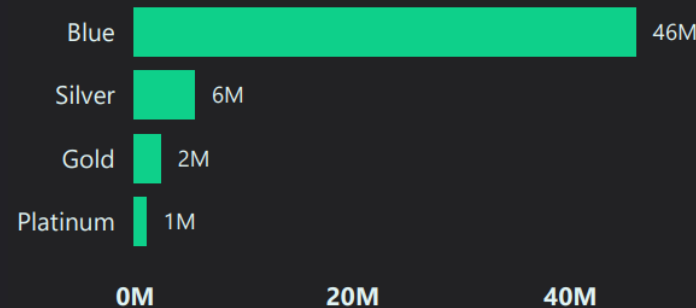
3.19

## 2. Revenue Analysis by Different Segments

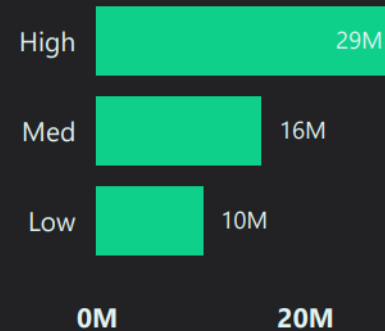
- **Gender:** Revenue is almost equally split between male and female customers, with females slightly ahead.



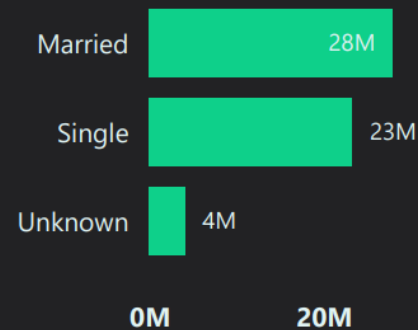
- **Card Category:** The highest revenue is generated from Blue cardholders (46 million), followed by Silver (6 million), Gold (2 million), and Platinum (1 million) cardholders.



- **Income Group:** High-income groups contribute the most to revenue (29 million), followed by medium (16 million) and low-income groups (10 million).

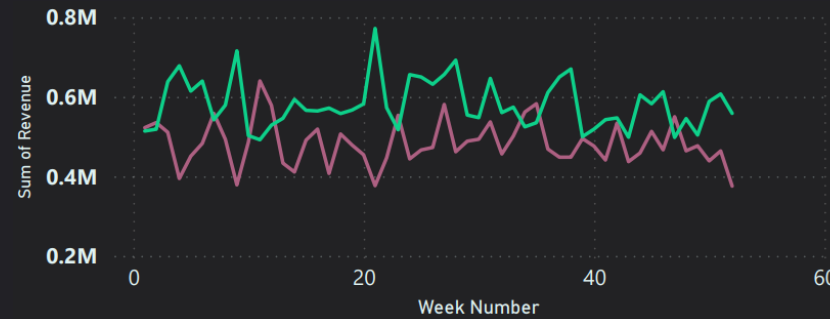


- **Marital Status:** Married customers contribute 28 million to the revenue, followed by single customers at 23 million.

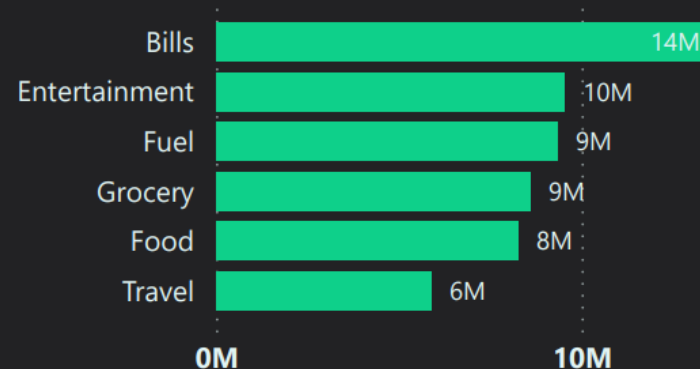


### 3. Spending Patterns and Trends

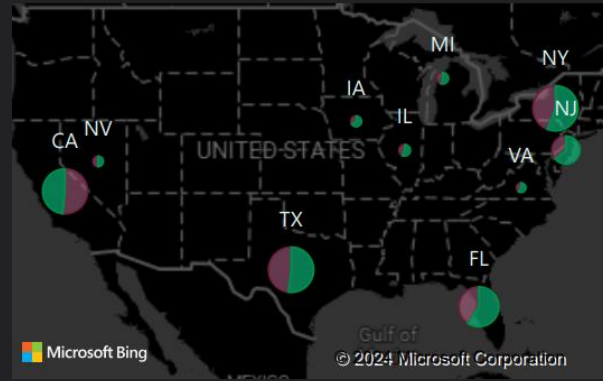
- **Weekly Revenue:** Revenue shows fluctuations across weeks, indicating varying spending behaviors.



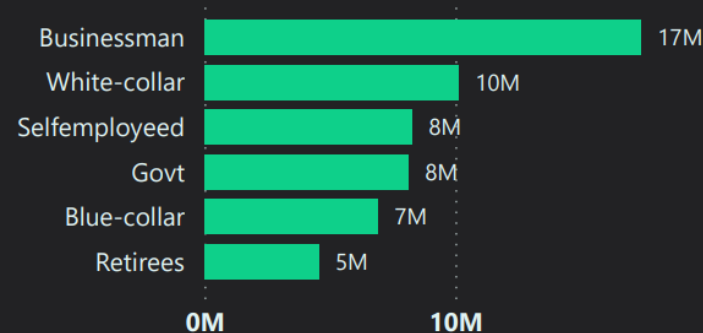
- **Expenditure Type:** The highest revenue by expenditure type is from bills (14 million), followed by entertainment (10 million) and fuel (9 million).



- **Geographic Insights:** The dashboard includes a map showing revenue distribution by state, highlighting areas with the highest credit card spending filtered by gender.



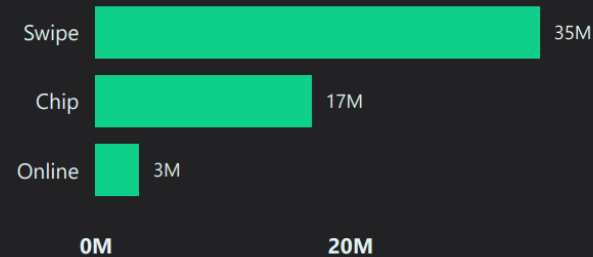
- **Job Type:** Business professionals contribute the most to revenue (17 million), followed by white-collar workers (10 million).



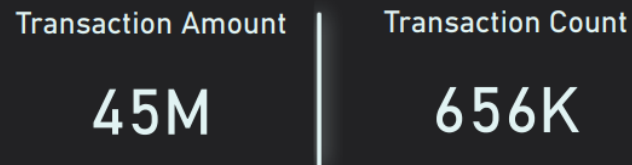


## 4. Transaction Behavior

- **Use of Card:** Swipe transactions generate the highest revenue (35 million), followed by chip and online transactions.

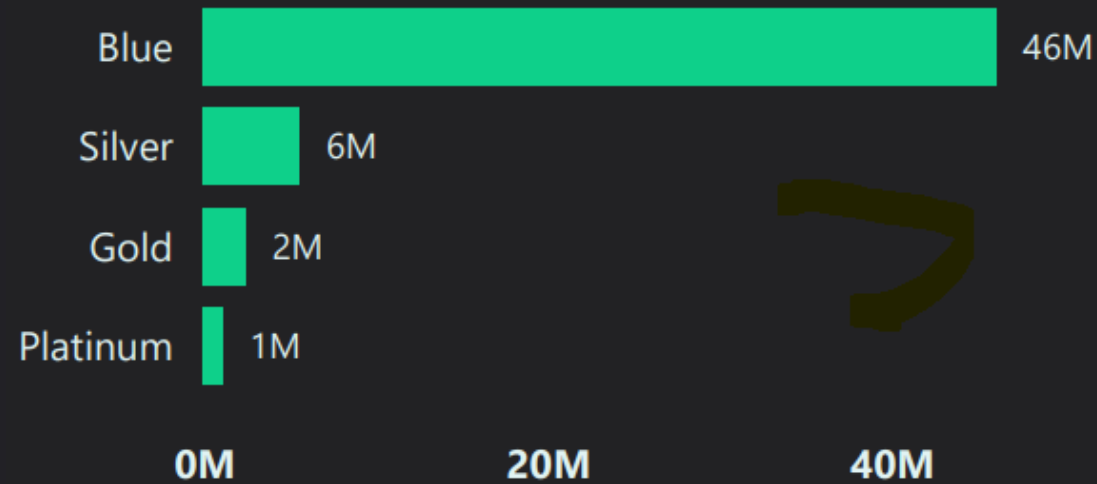


- **Transaction Amount and Count:** The dashboard shows both the transaction amount and count, allowing for a comprehensive view of credit card usage.



## 5. Key Drivers and Anomalies

Potential anomalies, such as low revenue from high-value card categories like Gold and Platinum, suggest further investigation may be needed.



# Recommendations

Based on the insights from the dashboard, there are a few key recommendations to consider that could help improve overall credit card performance and customer engagement:

- **Targeted Marketing:** Focus on high-income and high-spending customers by tailoring marketing efforts with personalized offers, exclusive benefits, and loyalty programs to maximize revenue from these segments.
- **Customer Engagement:** Enhance engagement strategies for lower-spending segments, such as Gold and Platinum cardholders, by encouraging increased usage through exclusive experiences, additional rewards, or personalized financial services.
- **Promotion of Online Transactions:** Boost online transaction revenue by promoting online card usage with special incentives like cashback rewards, discounts at online retailers, or double rewards points. This encourages more online spending while offering convenience and security.

**Implementing these strategies can optimize credit card operations and improve customer satisfaction and loyalty.**

# Conclusion

In developing the credit card spending analysis dashboard, I utilized SQL Server to manage the data and Power BI to visualize the insights. This dashboard provides a detailed overview of customer behavior and spending patterns, allowing for a deeper understanding of the factors driving revenue. The insights generated can help in making informed strategic decisions and refining customer engagement strategies to maximize revenue and improve customer satisfaction.