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SQL PROJECT
Credit Card Transactions

This project is a part of NamasteySQL: Zero to Hero SQL course provided by Ankit Bansal Sir.

This project consists of one table with column name :

- transaction_id
- city
- transaction_date
- card_type
- exp_type
- gender
- amount

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Basic Data Exploration

```
SELECT * FROM credit_card;
```

Results | Messages

	transaction_id	city	transaction_date	card_type	exp_type	gender	amount
1	1	Delhi	2014-10-29	Gold	Bills	F	82475
2	2	Greater Mumbai	2014-08-22	Platinum	Bills	F	32555
3	3	Bengaluru	2014-08-27	Silver	Bills	F	101738
4	4	Greater Mumbai	2014-04-12	Signature	Bills	F	123424
5	5	Bengaluru	2015-05-05	Gold	Bills	F	171574
6	6	Delhi	2014-09-08	Silver	Bills	F	100036
7	7	Delhi	2015-02-24	Gold	Bills	F	143250
8	8	Greater Mumbai	2014-06-26	Platinum	Bills	F	150980
9	9	Delhi	2014-03-28	Silver	Bills	F	192247
10	10	Delhi	2014-09-01	Platinum	Bills	F	67932
11	11	Delhi	2014-06-22	Platinum	Bills	F	280061
12	12	Greater Mumbai	2013-12-07	Signature	Bills	F	278036
13	13	Greater Mumbai	2014-08-07	Gold	Bills	F	19226
14	14	Delhi	2014-04-27	Signature	Bills	F	254359
15	15	Greater Mumbai	2014-08-15	Signature	Bills	F	302834
16	16	Greater Mumbai	2014-11-28	Platinum	Bills	F	647116
17	17	Greater Mumbai	2014-06-14	Signature	Bills	F	421878
18	18	Greater Mumbai	2015-03-30	Gold	Bills	F	986379
19	19	Greater Mumbai	2014-03-15	Platinum	Bills	F	213047
20	20	Greater Mumbai	2013-11-09	Platinum	Bills	F	735566
21	21	Delhi	2014-04-04	Signature	Bills	F	366102

Query executed successfully.

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Total number of records

```sql
SELECT count(*) AS no_of_records
FROM credit_card;  -- 26052
```

Results | Messages

	no_of_records
1	26052

Distinct cards type

```sql
SELECT DISTINCT card_type AS distinct_card
FROM credit_card ;
```

Results | Messages

	distinct_card
1	Silver
2	Signature
3	Gold
4	Platinum

Number of transactions by cards_type

```sql
SELECT card_type ,
COUNT(transaction_id) AS no_of_transactions
FROM credit_card
GROUP BY card_type;
```

Results | Messages

	card_type	no_of_transactions
1	Silver	6840
2	Signature	6447
3	Gold	6367
4	Platinum	6398

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TOP 10 Transactions by city

```
SELECT TOP 10 city ,
COUNT( transaction_id ) AS no_of_transactions
FROM credit_card
GROUP BY city
ORDER BY 2 DESC;
```

Results | Messages

	city	no_of_transactions
1	Bengaluru	3552
2	Greater Mumbai	3493
3	Ahmedabad	3491
4	Delhi	3482
5	Hyderabad	784
6	Chennai	774
7	Kolkata	773
8	Kanpur	764
9	Lucknow	759
10	Jaipur	752

```
-- Transactions by gender
SELECT gender ,
COUNT(1) AS counts
FROM credit_card
GROUP BY gender
ORDER BY  2 DESC;

-- F-> Female ; M -> Male
```

Results | Messages

	gender	counts
1	F	13680
2	M	12372

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Questions from the Stakeholder.

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Q.1- write a query to print top 5 cities with highest spends and their percentage contribution of total credit card spends

```
WITH amount_spend_by_city AS (
SELECT city , SUM(amount) AS amount_spend
FROM credit_card
GROUP BY city
),
total_amount_spend AS (
SELECT SUM( CAST(amount AS BIGINT) ) AS total_amount
FROM credit_card
)
SELECT TOP 5 t1.* ,
((t1.amount_spend*1.0)*100/t2.total_amount) AS
percent_spend
FROM amount_spend_by_city t1
INNER JOIN total_amount_spend t2
ON 1=1
ORDER BY t1.amount_spend DESC ;
```

Results Messages

	city	amount_spend	percent_spend
1	Greater Mumbai	576751476	14.153989211474930167653
2	Bengaluru	572326739	14.045402268280676516389
3	Ahmedabad	567794310	13.934172468553599430825
4	Delhi	556929212	13.667533393886336956728
5	Kolkata	115466943	2.833660482047887654816

Q.2- write a query to print highest spend month and amount spent in that month for each card type */

```
WITH cte1 AS (
SELECT DATEPART(MONTH , transaction_date) AS month_no ,
 DATEPART(YEAR , transaction_date) AS year_of_transaction ,
 card_type, amount
FROM credit_card
),
cte2 AS (
SELECT card_type , month_no , year_of_transaction ,
SUM(amount) AS amount_spend
FROM cte1
GROUP BY card_type ,year_of_transaction , month_no
),
rn AS (
SELECT * , DENSE_RANK() OVER(PARTITION BY card_type ORDER
BY amount_spend DESC) AS drnk
FROM cte2
)
SELECT card_type ,year_of_transaction , month_no ,
amount_spend
FROM rn
WHERE drnk=1
ORDER BY amount_spend DESC ;
```

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Results | Messages

	card_type	year_of_transaction	month_no	amount_spend
1	Silver	2015	3	59723549
2	Signature	2013	12	58799522
3	Platinum	2014	8	57936507
4	Gold	2015	1	55455064

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Q.3- write a query to print the transaction details(all columns from the table) for each card type when it reaches a cumulative of 1000000 total spends(We should have 4 rows in the o/p one for each card type).

```
WITH cte AS(
SELECT * ,
SUM(CAST(amount AS BIGINT)) OVER(PARTITION BY card_type
ORDER BY transaction_date,transaction_id) AS cumm_amt
FROM credit_card
),
cte2 AS (
SELECT * ,
DENSE_RANK() OVER(PARTITION BY card_type ORDER BY
cumm_amt) AS rk
FROM cte
WHERE cumm_amt > 1000000
)
SELECT *
FROM cte2
WHERE rk=1 ;
```

Results Messages

	transaction_id	city	transaction_date	card_type	exp_type	gender	amount	cumm_amt
1	1522	Delhi	2013-10-04	Gold	Food	M	281924	1272624
2	191	Ahmedabad	2013-10-05	Platinum	Bills	F	612572	1537482
3	73	Delhi	2013-10-04	Signature	Bills	F	550782	1285819
4	7565	Bengaluru	2013-10-04	Silver	Food	F	205179	1115582

Q.4- write a query to find city which had lowest percentage spend for gold card type?

```
WITH cte AS (
SELECT city , card_type , SUM(CAST(amount AS BIGINT)) as total_amount,
SUM(CASE WHEN card_type='Gold' THEN amount ELSE 0 END) AS gold_amt
FROM credit_card
GROUP BY city , card_type
)
SELECT TOP 1 city , ((SUM(gold_amt)*1.0)/SUM(total_amount))*100 AS
gold_pct
FROM cte
GROUP BY city
HAVING SUM(gold_amt)>0
ORDER BY gold_pct ASC;
```

Results | Messages

	city	gold_pct
1	Dhamtari	0.33298764700487488270 0

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Q.5- write a query to print 3 columns: city, highest_expense_type , lowest_expense_type(example format : Delhi , bills, Fuel)

```
WITH total_exp AS (
SELECT city ,exp_type , SUM(amount) AS total_expense
FROM credit_card
GROUP BY city ,exp_type
) ,
rnk AS (
 SELECT city , exp_type , total_expense,
DENSE_RANK() OVER(PARTITION BY city ORDER BY total_expense ASC) AS
asc_rnk ,
DENSE_RANK() OVER(PARTITION BY city ORDER BY total_expense DESC) AS
des_rnk
 FROM total_exp
 )
SELECT city ,
MAX(CASE WHEN asc_rnk = 1 THEN exp_type END) AS lowest_expense_type ,
MAX(CASE WHEN des_rnk = 1 THEN exp_type END) AS highest_expense_type
FROM rnk
GROUP BY city ;
```

Results | Messages

	city	lowest_expense_type	highest_expense_type
1	Achalpur	Entertainment	Grocery
2	Adilabad	Food	Bills
3	Adityapur	Grocery	Food
4	Adoni	Entertainment	Bills
5	Adoor	Bills	Fuel
6	Afzalpur	Food	Fuel
7	Agartala	Food	Grocery
8	Agra	Grocery	Bills
9	Ahmed...	Grocery	Bills
10	Ahmed...	Grocery	Fuel
11	Aizawl	Grocery	Food
12	Ajmer	Fuel	Entertainment
13	Akola	Fuel	Bills
14	Akot	Entertainment	Fuel
15	Alappu...	Entertainment	Food
16	Aligarh	Entertainment	Bills
17	Alipurd...	Entertainment	Food
18	Alirajpur	Entertainment	Entertainment
19	Allahab...	Bills	Grocery
20	Alwar	Entertainment	Food
21	Amalap...	Fuel	Grocery
22	Amalner	Food	Entertainment
23	Ambejo...	Grocery	Food

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Q.6- write a query to find percentage contribution of spends by females for each expense type.

```
SELECT exp_type ,
(SUM(CASE WHEN gender = 'F' THEN amount ELSE 0 END)*1.0 / SUM(amount) )*100 AS
pct_females_contribution
FROM credit_card
GROUP BY exp_type
ORDER BY pct_females_contribution DESC ;
```

Results | Messages

	exp_type	pct_females_contribution
1	Bills	63.945879327700
2	Food	54.905310632200
3	Travel	51.132870420700
4	Grocery	50.911022600900
5	Fuel	49.710380717800
6	Entertainment	49.372907542000

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Q.7- which card and expense type combination saw highest month over month growth in Jan-2014.

```
WITH cte AS (
SELECT card_type , exp_type , amount ,
DATEPART(YEAR , transaction_date) AS yr ,
DATEPART(MONTH , transaction_date) AS mnth
FROM credit_card
),
amount_spend AS (
SELECT card_type , exp_type , yr , mnth ,
SUM(amount) AS total_exp
FROM cte
GROUP BY card_type , exp_type , yr , mnth
),
previous_expenses AS (
SELECT card_type , exp_type , yr , mnth , total_exp,
LAG(total_exp , 1 , 0) OVER(PARTITION BY card_type , exp_type ORDER
BY yr , mnth) AS prev_month_exp
FROM amount_spend
)
SELECT TOP 1 * --card_type , exp_type , total_exp , prev_month_exp
,(total_exp - prev_month_exp) AS MoM_Growth
FROM previous_expenses
WHERE yr = '2014' AND mnth = '1'
ORDER BY MoM_Growth DESC ;
```

Results | Messages

	card_type	exp_type	yr	mnth	total_exp	prev_month_exp	MoM_Growth
1	Platinum	Grocery	2014	1	12256343	7757562	4498781

Q.8- During weekends which city has highest total spend to total no of transcations ratio.

```
SELECT TOP 1 city , SUM(amount) AS total_spend , SUM(amount)*1.0/COUNT(1) AS ratio
FROM
(SELECT * ,
DATEPART(WEEKDAY , transaction_date) AS week_day --,DATENAME(WEEKDAY ,
transaction_date) => SUN=1 , SAT=7
FROM credit_card) a
WHERE week_day IN (1,7)
GROUP BY city
ORDER BY ratio DESC;
```

Results Messages

	city	total_spend	ratio
1	Sonepur	299905	299905.000000000000

Q.9- Which city took least number of days to reach its 500th transaction after the first transaction in that city ?

```
WITH cte AS (
SELECT * ,
ROW_NUMBER() OVER(PARTITION BY city ORDER BY transaction_date , transaction_id)
AS rn
FROM credit_card
)
SELECT TOP 1 city ,
DATEDIFF(DAY , MIN(transaction_date) , MAX(transaction_date) ) AS no_of_days
FROM cte
WHERE rn=1 OR rn=500
GROUP BY city
HAVING COUNT(1) = 2
ORDER BY no_of_days ;
```

Results Messages

	city	no_of_days
1	Bengaluru	81

Thank You

Do share your views