```
mysql> use credit;
Database changed

-- Preview first 10 rows
mysql> SELECT * FROM credit_card_transactions LIMIT 10;
+-------+----------------------+-----------+-----------+----------+--------+--------+
| index | City                 | Date      | card_type | exp_type | Gender | Amount |
+-------+----------------------+-----------+-----------+----------+--------+--------+
|     0 | Delhi, India         | 29-Oct-14 | Gold      | Bills    | F      |  82475 |
|     1 | Greater Mumbai, India | 22-Aug-14 | Platinum  | Bills    | F      |  32555 |
|     2 | Bengaluru, India     | 27-Aug-14 | Silver    | Bills    | F      | 101738 |
|     3 | Greater Mumbai, India | 12-Apr-14 | Signature | Bills    | F      | 123424 |
|     4 | Bengaluru, India     | 05-May-15 | Gold      | Bills    | F      | 171574 |
|     5 | Delhi, India         | 08-Sep-14 | Silver    | Bills    | F      | 100036 |
|     6 | Delhi, India         | 24-Feb-15 | Gold      | Bills    | F      | 143250 |
|     7 | Greater Mumbai, India | 26-Jun-14 | Platinum  | Bills    | F      | 150980 |
|     8 | Delhi, India         | 28-Mar-14 | Silver    | Bills    | F      | 192247 |
|     9 | Delhi, India         | 01-Sep-14 | Platinum  | Bills    | F      |  67932 |
+-------+----------------------+-----------+-----------+----------+--------+--------+
10 rows in set (0.00 sec)

-- Count total transactions
mysql> SELECT COUNT(*) AS total_transactions FROM credit_card_transactions;
+--------------------+
| total_transactions |
+--------------------+
|              26052 |
+--------------------+
1 row in set (0.05 sec)
```

-- Total amount spent

```
mysql> SELECT SUM(Amount) AS total_amount_spent FROM credit_card_transactions;
+--------------------+
| total_amount_spent |
+--------------------+
|        4074833373 |
+--------------------+
```

-- Unique card types used

```
mysql> SELECT DISTINCT card_Type FROM credit_card_transactions;
+-----------+
| card_Type |
+-----------+
| Gold      |
| Platinum  |
| Silver    |
| Signature |
+-----------+
```

-- Unique expense categories

```
mysql> SELECT DISTINCT exp_Type FROM credit_card_transactions;
+---------------+
| exp_Type      |
+---------------+
| Bills         |
| Food          |
| Entertainment |
| Grocery       |
| Fuel          |
| Travel        |
+---------------+
```

-- Total spending by city

```
mysql> SELECT City, SUM(Amount) AS total_spending FROM credit_card_transactions
    -> GROUP BY City ORDER BY total_spending DESC LIMIT 10;
+----------------------+----------------+
| City                 | total_spending |
+----------------------+----------------+
| Greater Mumbai, India |      576751476 |
| Bengaluru, India      |      572326739 |
| Ahmedabad, India      |      567794310 |
| Delhi, India          |      556929212 |
| Kolkata, India        |      115466943 |
| Lucknow, India        |      115334476 |
| Chennai, India        |      114730600 |
| Hyderabad, India      |      114493477 |
| Surat, India          |      114486151 |
| Kanpur, India         |      114370532 |
+----------------------+----------------+
10 rows in set (0.14 sec)
```

-- Spending by card type

```
mysql> SELECT Card_Type, SUM(Amount) AS total_spending FROM credit_card_transactions
    -> GROUP BY Card_Type ORDER BY total_spending DESC;
+-----------+----------------+
| Card_Type | total_spending |
+-----------+----------------+
| Silver    |     1069613713 |
| Signature |     1013041105 |
| Platinum  |     1007639019 |
| Gold      |      984539536 |
+-----------+----------------+
4 rows in set (0.09 sec)
```

-- Spending per gender

```
mysql> SELECT Gender, SUM(Amount) AS total_spending FROM credit_card_transactions GROUP BY Gender;
+--------+----------------+
| Gender | total_spending |
+--------+----------------+
| F      |     2205311030 |
| M      |     1869522343 |
+--------+----------------+
2 rows in set (0.12 sec)
```

-- High-Risk Transaction Identification(High risk = unusually high-spend)

-- Find transactions above ₹10,000

```
mysql> SELECT * FROM credit_card_transactions
    -> WHERE Amount > 10000 ORDER BY Amount DESC LIMIT 10;
+-------+----------------------+-----------+-----------+----------+--------+--------+
| index | City                 | Date      | card_type | exp_type | Gender | Amount |
+-------+----------------------+-----------+-----------+----------+--------+--------+
|    80 | Greater Mumbai, India | 14-Oct-14 | Platinum  | Bills    | F      | 998077 |
|   134 | Delhi, India          | 27-Oct-13 | Gold      | Bills    | F      | 996754 |
|   254 | Ahmedabad, India      | 17-Apr-15 | Gold      | Bills    | F      | 996291 |
|   183 | Ahmedabad, India      | 27-Aug-14 | Platinum  | Bills    | F      | 995634 |
|   330 | Delhi, India          | 07-Jun-14 | Signature | Bills    | F      | 994537 |
|   343 | Greater Mumbai, India | 06-Sep-14 | Signature | Bills    | F      | 994184 |
|    68 | Greater Mumbai, India | 22-Mar-14 | Gold      | Bills    | F      | 991685 |
|   141 | Greater Mumbai, India | 04-Oct-13 | Gold      | Bills    | F      | 990700 |
|    28 | Bengaluru, India      | 18-Jan-15 | Platinum  | Bills    | F      | 987935 |
|    17 | Greater Mumbai, India | 30-Mar-15 | Gold      | Bills    | F      | 986379 |
+-------+----------------------+-----------+-----------+----------+--------+--------+
10 rows in set (0.10 sec)
```

-- Monthly Spending Trend

```
mysql> SELECT
    ->     YEAR(STR_TO_DATE(Date, '%d-%b-%y')) AS year,
    ->     MONTH(STR_TO_DATE(Date, '%d-%b-%y')) AS month,
    ->     SUM(Amount) AS monthly_spending
    -> FROM credit_card_transactions
    -> GROUP BY
    ->     YEAR(STR_TO_DATE(Date, '%d-%b-%y')),
    ->     MONTH(STR_TO_DATE(Date, '%d-%b-%y'))
    -> ORDER BY year, month LIMIT 10;
+------+-------+------------------+
| year | month | monthly_spending |
+------+-------+------------------+
| 2013 |    10 |        207360092 |
| 2013 |    11 |        192015963 |
| 2013 |    12 |        214267829 |
| 2014 |     1 |        207650982 |
| 2014 |     2 |        189220180 |
| 2014 |     3 |        203233307 |
| 2014 |     4 |        208284732 |
| 2014 |     5 |        201762312 |
| 2014 |     6 |        191321039 |
| 2014 |     7 |        197981416 |
+------+-------+------------------+
```

-- Category-wise Total & Average Spending.

Using CTE to get summary statistics for each expense type

```
mysql> WITH exp_summary AS (
    ->     SELECT      Exp_Type,
    ->         SUM(Amount) AS total_spending,
    ->         AVG(Amount) AS avg_spending,
```

```
   ->       COUNT(*) AS transaction_count
   ->    FROM credit_card_transactions
   ->    GROUP BY Exp_Type
   -> )
   -> SELECT * FROM exp_summary ORDER BY total_spending DESC;
+---------------+----------------+--------------+-------------------+
| Exp_Type      | total_spending | avg_spending | transaction_count |
+---------------+----------------+--------------+-------------------+
| Bills         |     907072473 |  178627.8994 |              5078 |
| Food          |     824724009 |  150965.4053 |              5463 |
| Fuel          |     789135821 |  150111.4364 |              5257 |
| Entertainment |     726437536 |  152548.8316 |              4762 |
| Grocery       |     718207923 |  151074.4474 |              4754 |
| Travel        |     109255611 |  148042.8333 |               738 |
+---------------+----------------+--------------+-------------------+

-- Find Top 5 Most Expensive Cities
mysql> WITH city_spending AS (
   ->    SELECT City, SUM(Amount) AS total_spending FROM credit_card_transactions GROUP BY City
   -> )
   -> SELECT * FROM city_spending ORDER BY total_spending DESC
   -> LIMIT 5;
+----------------------+----------------+
| City                 | total_spending |
+----------------------+----------------+
| Greater Mumbai, India |     576751476 |
| Bengaluru, India      |     572326739 |
| Ahmedabad, India      |     567794310 |
| Delhi, India          |     556929212 |
| Kolkata, India        |     115466943 |
+----------------------+----------------+
```

-- Rank Cities by Spending. RANK() to find top spending cities without removing others

```
mysql> SELECT City,
    ->     SUM(Amount) AS total_spending,
    ->     RANK() OVER (ORDER BY SUM(Amount) DESC) AS spending_rank
    -> FROM credit_card_transactions GROUP BY City LIMIT 10;
+----------------------+----------------+---------------+
| City                 | total_spending | spending_rank |
+----------------------+----------------+---------------+
| Greater Mumbai, India |      576751476 |             1 |
| Bengaluru, India      |      572326739 |             2 |
| Ahmedabad, India      |      567794310 |             3 |
| Delhi, India          |      556929212 |             4 |
| Kolkata, India        |      115466943 |             5 |
| Lucknow, India        |      115334476 |             6 |
| Chennai, India        |      114730600 |             7 |
| Hyderabad, India      |      114493477 |             8 |
| Surat, India          |      114486151 |             9 |
| Kanpur, India         |      114370532 |            10 |
+----------------------+----------------+---------------+
10 rows in set (0.15 sec)
```

-- Running Total (Cumulative Spending Over Time) OR Running total of spending by date

```
mysql> SELECT Date, Amount,
    ->     SUM(Amount) OVER (ORDER BY Date) AS running_total
    -> FROM credit_card_transactions ORDER BY Date LIMIT 10;
+-----------+--------+---------------+
| Date      | Amount | running_total |
+-----------+--------+---------------+
| 01-Apr-14 | 190469 |       6118911 |
| 01-Apr-14 | 188330 |       6118911 |
| 01-Apr-14 | 163677 |       6118911 |
```

| 01-Apr-14 | 274661 | 6118911 |

| 01-Apr-14 | 168379 | 6118911 |

| 01-Apr-14 | 290618 | 6118911 |

| 01-Apr-14 | 103146 | 6118911 |

| 01-Apr-14 | 68259 | 6118911 |

| 01-Apr-14 | 225017 | 6118911 |

| 01-Apr-14 | 174903 | 6118911 |

+-----------+--------+---------------+

10 rows in set (0.20 sec)

-- Detect Outliers (Amount vs City Avg) OR Compare each transaction with city average spending

```
mysql> SELECT City, Amount,
    ->     AVG(Amount) OVER (PARTITION BY City) AS city_avg,
    ->     Amount - AVG(Amount) OVER (PARTITION BY City) AS deviation
    -> FROM credit_card_transactions
    -> LIMIT 10;
```

+-----------------+--------+-------------+--------------+

| City | Amount | city_avg | deviation |

+-----------------+--------+-------------+--------------+

| Achalpur, India | 209805 | 178515.6667 | 31289.3333 |

| Achalpur, India | 138246 | 178515.6667 | -40269.6667 |

| Achalpur, India | 216180 | 178515.6667 | 37664.3333 |

| Achalpur, India | 201032 | 178515.6667 | 22516.3333 |

| Achalpur, India | 192579 | 178515.6667 | 14063.3333 |

| Achalpur, India | 55347 | 178515.6667 | -123168.6667 |

| Achalpur, India | 241504 | 178515.6667 | 62988.3333 |

| Achalpur, India | 173336 | 178515.6667 | -5179.6667 |

| Achalpur, India | 178612 | 178515.6667 | 96.3333 |

| Adilabad, India | 178349 | 176946.4000 | 1402.6000 |

+-----------------+--------+-------------+--------------+

10 rows in set (0.30 sec)

-- Print Top 5 Cities With Highest Spends And Their Percentage Contribution Of Total Credit Card Spends

```
mysql> WITH citysum AS (
    ->     SELECT city, SUM(amount) AS total_spend FROM credit_card_transactions
    ->     GROUP BY city
    -> ),
    -> total_spent AS (
    ->     SELECT SUM(amount) AS total_amount FROM credit_card_transactions
    -> )
    -> SELECT city, total_spend,
    ->     ROUND((total_spend / total_amount) * 100, 2) AS pct_contribution
    -> FROM citysum
    -> CROSS JOIN total_spent ORDER BY total_spend DESC LIMIT 5;
+----------------------+-------------+------------------+
| city                 | total_spend | pct_contribution |
+----------------------+-------------+------------------+
| Greater Mumbai, India |   576751476 |          14.15 |
| Bengaluru, India      |   572326739 |          14.05 |
| Ahmedabad, India      |   567794310 |          13.93 |
| Delhi, India          |   556929212 |          13.67 |
| Kolkata, India        |   115466943 |           2.83 |
+----------------------+-------------+------------------+
5 rows in set (0.20 sec)
```

-- Highest Amount Spent in a Month for Each Card Type

```
mysql> WITH m AS (
    ->   SELECT card_type, YEAR(STR_TO_DATE(Date,'%d-%b-%y')) yr,
    ->         MONTH(STR_TO_DATE(Date,'%d-%b-%y')) mn, SUM(amount) total_spent
    ->   FROM credit_card_transactions GROUP BY card_type, yr, mn
    -> )
    -> SELECT card_type, yr, mn, total_spent
```

```
   -> FROM (SELECT m.*, RANK() OVER(PARTITION BY card_type ORDER BY total_spent DESC) r FROM
m) x
   -> WHERE r = 1
   -> LIMIT 5;
+-----------+------+------+-------------+
| card_type | yr   | mn   | total_spent |
+-----------+------+------+-------------+
| Gold      | 2015 |    1 |    55455064 |
| Platinum  | 2014 |    8 |    57936507 |
| Signature | 2013 |   12 |    58799522 |
| Silver    | 2015 |    3 |    59723549 |
+-----------+------+------+-------------+

-- Percentage Spend Contribution by Females for Each Expense Type
mysql> SELECT
   ->     exp_type,
   ->     ROUND(SUM(CASE WHEN gender = 'F' THEN amount ELSE 0 END)
   ->         / SUM(amount) * 100, 2) AS female_spent_percent
   -> FROM credit_card_transactions
   -> GROUP BY exp_type
   -> ORDER BY female_spent_percent DESC;
+---------------+----------------------+
| exp_type      | female_spent_percent |
+---------------+----------------------+
| Bills         |                63.95 |
| Food          |                54.91 |
| Travel        |                51.13 |
| Grocery       |                50.91 |
| Fuel          |                49.71 |
| Entertainment |                49.37 |
+---------------+----------------------+
```

-- Jan-2014 Month over Month growth

```
mysql> WITH m AS (
    ->   SELECT card_type, exp_type, YEAR(STR_TO_DATE(Date,'%d-%b-%y')) yr,
    ->         MONTH(STR_TO_DATE(Date,'%d-%b-%y')) mn, SUM(amount) total_spend
    ->   FROM credit_card_transactions GROUP BY card_type, exp_type, yr, mn
    -> ),
    -> g AS (
    ->   SELECT t.card_type, t.exp_type, t.total_spend - p.total_spend AS mom_growth
    ->   FROM m t JOIN m p ON t.card_type=p.card_type AND t.exp_type=p.exp_type
    ->   WHERE t.yr=2014 AND t.mn=1 AND p.yr=2013 AND p.mn=12
    -> )
    -> SELECT * FROM g ORDER BY mom_growth DESC LIMIT 1;
+-----------+----------+------------+
| card_type | exp_type | mom_growth |
+-----------+----------+------------+
| Platinum  | Grocery  |    4498781 |
+-----------+----------+------------+
```

-- Query to Find Which City Has Highest (Total Spend to Total No of Transactions) Ratio During Weekends

```
mysql> SELECT City,
    ->     SUM(Amount) / COUNT(*) AS spend_per_txn
    -> FROM credit_card_transactions
    -> WHERE DAYOFWEEK(STR_TO_DATE(Date, '%d-%b-%y')) IN (1,7)
    -> GROUP BY City ORDER BY spend_per_txn DESC
    -> LIMIT 1;
+---------------+---------------+
| City          | spend_per_txn |
+---------------+---------------+
| Sonepur, India |   299905.0000 |
+---------------+---------------+
```

-- Query to Find Which City Took Least Number of Days to Reach Its 500th Transaction After the First Transaction

```
mysql> WITH t AS (
    ->   SELECT city, STR_TO_DATE(Date,'%d-%b-%y') AS dt,
    ->          ROW_NUMBER() OVER(PARTITION BY city ORDER BY STR_TO_DATE(Date,'%d-%b-%y')) rn
    ->   FROM credit_card_transactions
    -> )
    -> SELECT city,
    ->        DATEDIFF(MAX(CASE WHEN rn=500 THEN dt END),
    ->                 MIN(dt)) AS days_to_500
    -> FROM t
    -> GROUP BY city HAVING COUNT(*) >= 500
    -> ORDER BY days_to_500 ASC LIMIT 1;
+------------------+-------------+
| city             | days_to_500 |
+------------------+-------------+
| Bengaluru, India |          81 |
+------------------+-------------+
1 row in set (0.45 sec)
```