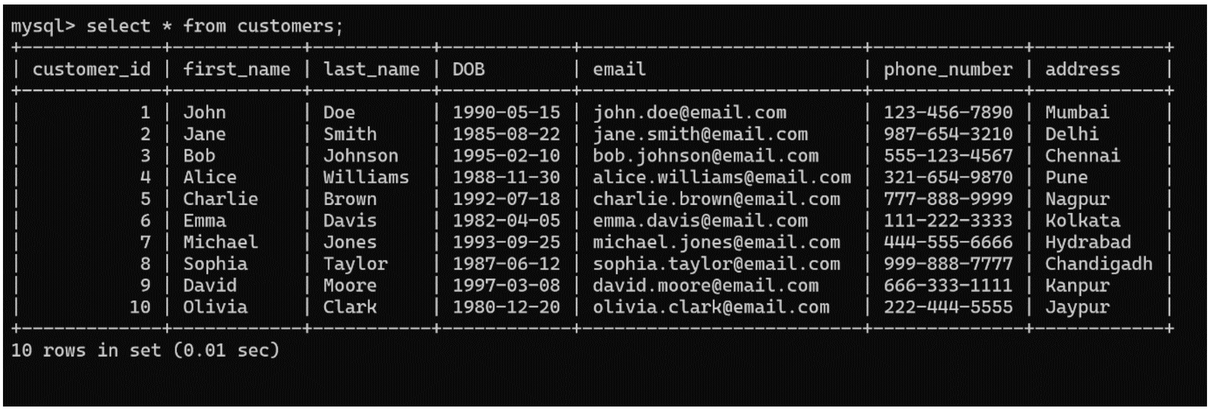
Data Engineering Batch 1 **Day 4: 22/01/2024**

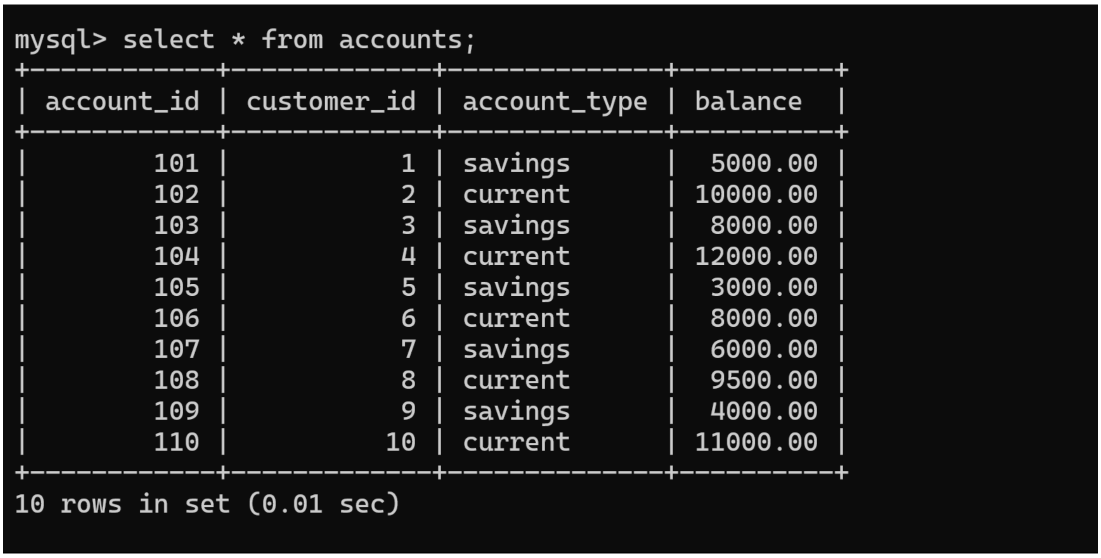
Name: Pradip Bochare

Statement: SQL Hands on Practical

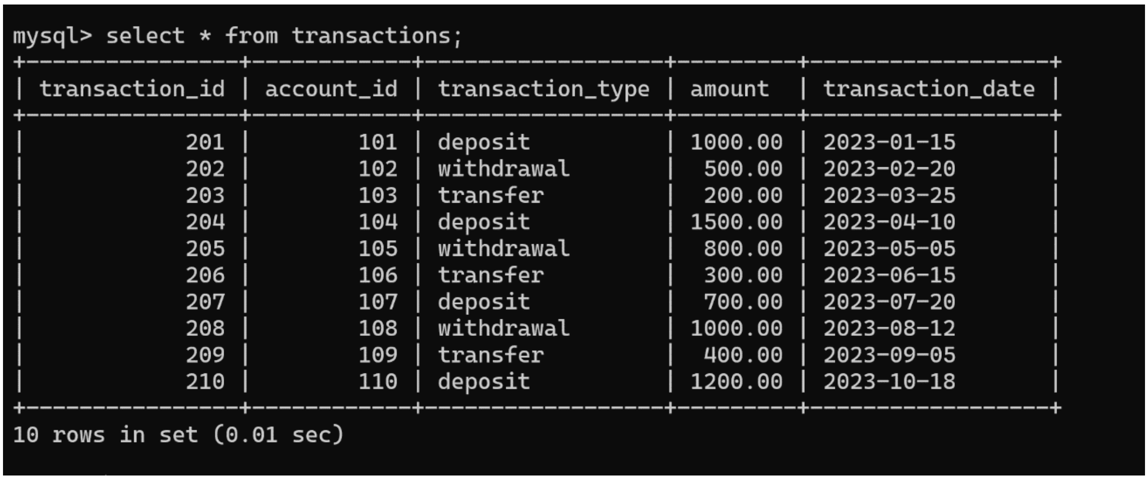
- Following are the tables used



```
mysql> select * from customers;
+-------------+------------+-----------+------------+-------------------------+--------------+------------+
| customer_id | first_name | last_name | DOB        | email                   | phone_number | address    |
+-------------+------------+-----------+------------+-------------------------+--------------+------------+
|           1 | John       | Doe       | 1990-05-15 | john.doe@email.com      | 123-456-7890 | Mumbai     |
|           2 | Jane       | Smith     | 1985-08-22 | jane.smith@email.com    | 987-654-3210 | Delhi      |
|           3 | Bob        | Johnson   | 1995-02-10 | bob.johnson@email.com   | 555-123-4567 | Chennai    |
|           4 | Alice      | Williams  | 1988-11-30 | alice.williams@email.com | 321-654-9870 | Pune      |
|           5 | Charlie    | Brown     | 1992-07-18 | charlie.brown@email.com | 777-888-9999 | Nagpur     |
|           6 | Emma       | Davis     | 1982-04-05 | emma.davis@email.com    | 111-222-3333 | Kolkata    |
|           7 | Michael    | Jones     | 1993-09-25 | michael.jones@email.com | 444-555-6666 | Hydrabad   |
|           8 | Sophia     | Taylor    | 1987-06-12 | sophia.taylor@email.com | 999-888-7777 | Chandigadh |
|           9 | David      | Moore     | 1997-03-08 | david.moore@email.com   | 666-333-1111 | Kanpur     |
|          10 | Olivia     | Clark     | 1980-12-20 | olivia.clark@email.com  | 222-444-5555 | Jaypur     |
+-------------+------------+-----------+------------+-------------------------+--------------+------------+
10 rows in set (0.01 sec)
```

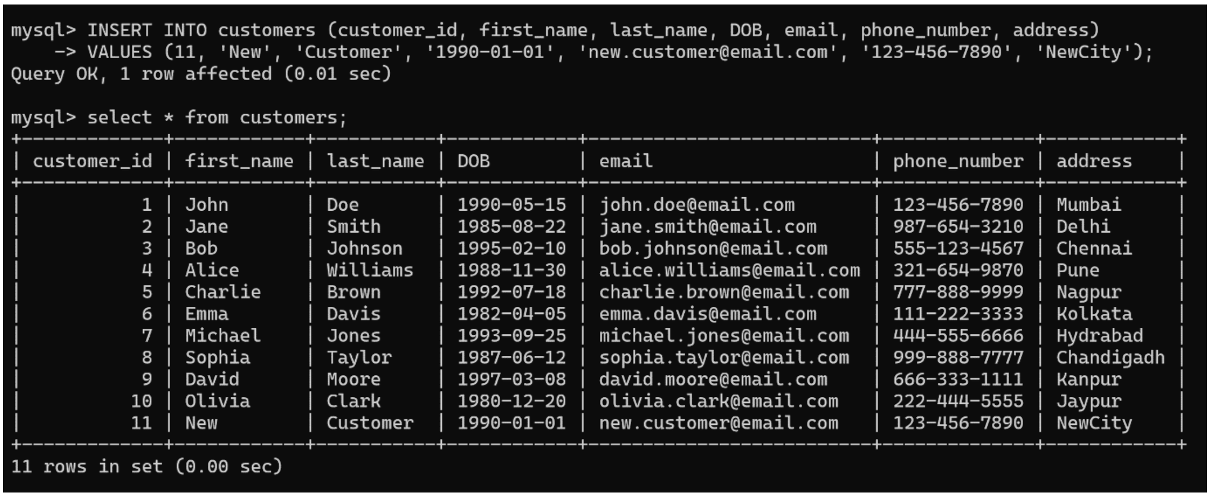


```
mysql> select * from accounts;
+------------+-------------+--------------+----------+
| account_id | customer_id | account_type | balance  |
+------------+-------------+--------------+----------+
|        101 |           1 | savings      |  5000.00 |
|        102 |           2 | current      | 10000.00 |
|        103 |           3 | savings      |  8000.00 |
|        104 |           4 | current      | 12000.00 |
|        105 |           5 | savings      |  3000.00 |
|        106 |           6 | current      |  8000.00 |
|        107 |           7 | savings      |  6000.00 |
|        108 |           8 | current      |  9500.00 |
|        109 |           9 | savings      |  4000.00 |
|        110 |          10 | current      | 11000.00 |
+------------+-------------+--------------+----------+
10 rows in set (0.01 sec)
```



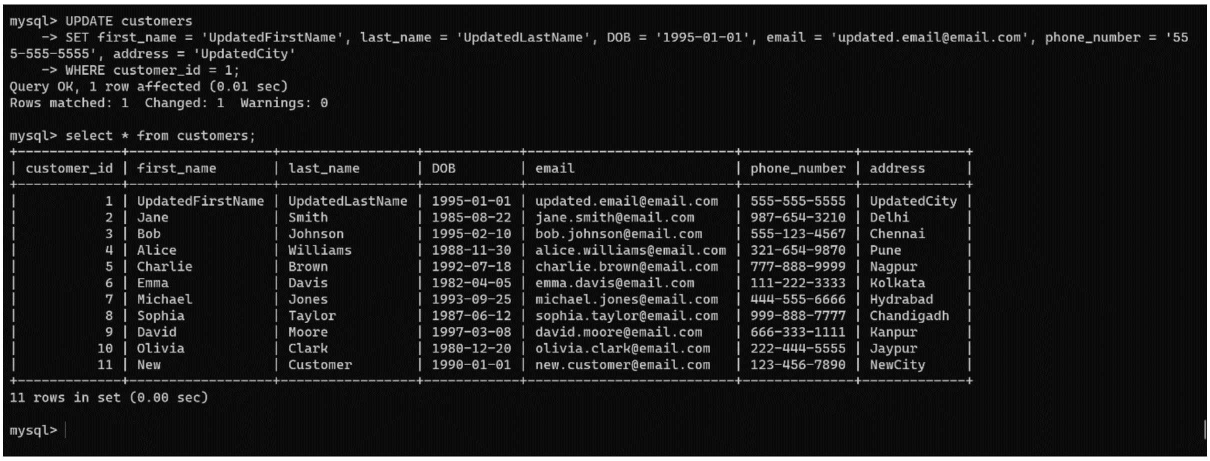
```
mysql> select * from transactions;
+----------------+------------+------------------+---------+------------------+
| transaction_id | account_id | transaction_type | amount  | transaction_date |
+----------------+------------+------------------+---------+------------------+
|            201 |        101 | deposit          | 1000.00 | 2023-01-15       |
|            202 |        102 | withdrawal       |  500.00 | 2023-02-20       |
|            203 |        103 | transfer         |  200.00 | 2023-03-25       |
|            204 |        104 | deposit          | 1500.00 | 2023-04-10       |
|            205 |        105 | withdrawal       |  800.00 | 2023-05-05       |
|            206 |        106 | transfer         |  300.00 | 2023-06-15       |
|            207 |        107 | deposit          |  700.00 | 2023-07-20       |
|            208 |        108 | withdrawal       | 1000.00 | 2023-08-12       |
|            209 |        109 | transfer         |  400.00 | 2023-09-05       |
|            210 |        110 | deposit          | 1200.00 | 2023-10-18       |
+----------------+------------+------------------+---------+------------------+
10 rows in set (0.01 sec)
```

Inserting Data in table



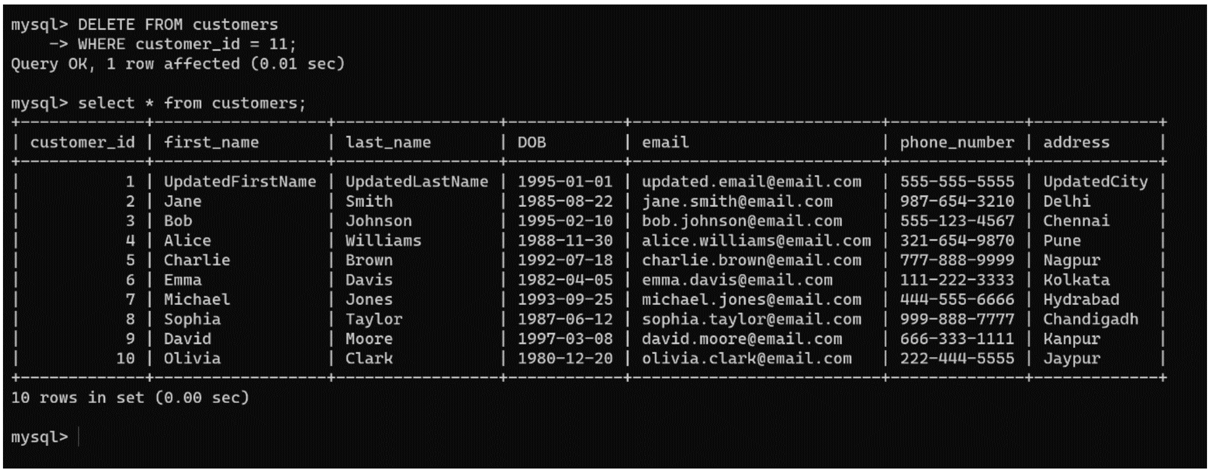
```
mysql> INSERT INTO customers (customer_id, first_name, last_name, DOB, email, phone_number, address)
    -> VALUES (11, 'New', 'Customer', '1990-01-01', 'new.customer@email.com', '123-456-7890', 'NewCity');
Query OK, 1 row affected (0.01 sec)

mysql> select * from customers;
+-------------+------------+-----------+------------+--------------------------+--------------+------------+
| customer_id | first_name | last_name | DOB        | email                    | phone_number | address    |
+-------------+------------+-----------+------------+--------------------------+--------------+------------+
|           1 | John       | Doe       | 1990-05-15 | john.doe@email.com       | 123-456-7890 | Mumbai     |
|           2 | Jane       | Smith     | 1985-08-22 | jane.smith@email.com     | 987-654-3210 | Delhi      |
|           3 | Bob        | Johnson   | 1995-02-10 | bob.johnson@email.com    | 555-123-4567 | Chennai    |
|           4 | Alice      | Williams  | 1988-11-30 | alice.williams@email.com | 321-654-9870 | Pune       |
|           5 | Charlie    | Brown     | 1992-07-18 | charlie.brown@email.com  | 777-888-9999 | Nagpur     |
|           6 | Emma       | Davis     | 1982-04-05 | emma.davis@email.com     | 111-222-3333 | Kolkata    |
|           7 | Michael    | Jones     | 1993-09-25 | michael.jones@email.com  | 444-555-6666 | Hydrabad   |
|           8 | Sophia     | Taylor    | 1987-06-12 | sophia.taylor@email.com  | 999-888-7777 | Chandigadh |
|           9 | David      | Moore     | 1997-03-08 | david.moore@email.com    | 666-333-1111 | Kanpur     |
|          10 | Olivia     | Clark     | 1980-12-20 | olivia.clark@email.com   | 222-444-5555 | Jaypur     |
|          11 | New        | Customer  | 1990-01-01 | new.customer@email.com   | 123-456-7890 | NewCity    |
+-------------+------------+-----------+------------+--------------------------+--------------+------------+
11 rows in set (0.00 sec)
```

Updating Data in table



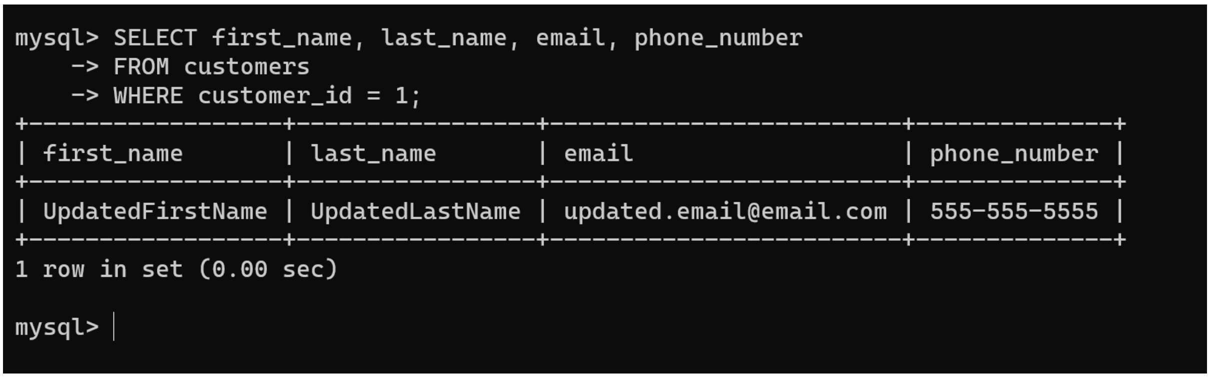
```
mysql> UPDATE customers
    -> SET first_name = 'UpdatedFirstName', last_name = 'UpdatedLastName', DOB = '1995-01-01', email = 'updated.email@email.com', phone_number = '55
5-555-5555', address = 'UpdatedCity'
    -> WHERE customer_id = 1;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from customers;
+-------------+------------------+-----------------+------------+--------------------------+--------------+-------------+
| customer_id | first_name       | last_name       | DOB        | email                    | phone_number | address     |
+-------------+------------------+-----------------+------------+--------------------------+--------------+-------------+
|           1 | UpdatedFirstName | UpdatedLastName | 1995-01-01 | updated.email@email.com  | 555-555-5555 | UpdatedCity |
|           2 | Jane             | Smith           | 1985-08-22 | jane.smith@email.com     | 987-654-3210 | Delhi       |
|           3 | Bob              | Johnson         | 1995-02-10 | bob.johnson@email.com    | 555-123-4567 | Chennai     |
|           4 | Alice            | Williams        | 1988-11-30 | alice.williams@email.com | 321-654-9870 | Pune        |
|           5 | Charlie          | Brown           | 1992-07-18 | charlie.brown@email.com  | 777-888-9999 | Nagpur      |
|           6 | Emma             | Davis           | 1982-04-05 | emma.davis@email.com     | 111-222-3333 | Kolkata     |
|           7 | Michael          | Jones           | 1993-09-25 | michael.jones@email.com  | 444-555-6666 | Hydrabad    |
|           8 | Sophia           | Taylor          | 1987-06-12 | sophia.taylor@email.com  | 999-888-7777 | Chandigadh  |
|           9 | David            | Moore           | 1997-03-08 | david.moore@email.com    | 666-333-1111 | Kanpur      |
|          10 | Olivia           | Clark           | 1980-12-20 | olivia.clark@email.com   | 222-444-5555 | Jaypur      |
|          11 | New              | Customer        | 1990-01-01 | new.customer@email.com   | 123-456-7890 | NewCity     |
+-------------+------------------+-----------------+------------+--------------------------+--------------+-------------+
11 rows in set (0.00 sec)

mysql>
```

Deleting Data in table



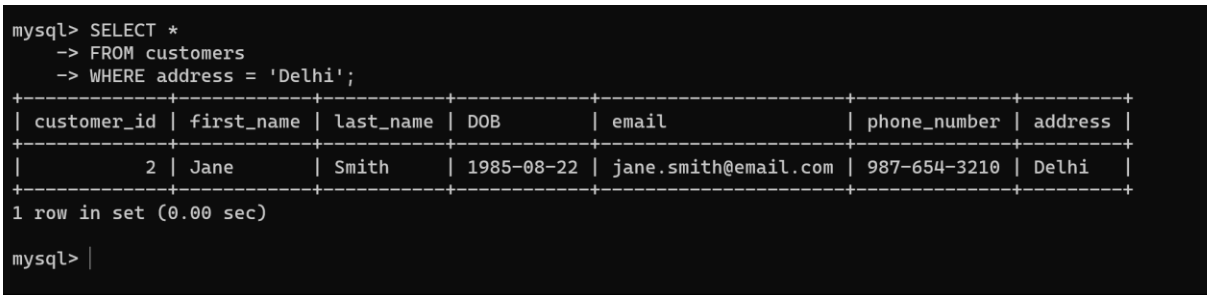
```
mysql> DELETE FROM customers
    -> WHERE customer_id = 11;
Query OK, 1 row affected (0.01 sec)

mysql> select * from customers;
+-------------+------------------+-----------------+------------+--------------------------+--------------+-------------+
| customer_id | first_name       | last_name       | DOB        | email                    | phone_number | address     |
+-------------+------------------+-----------------+------------+--------------------------+--------------+-------------+
|           1 | UpdatedFirstName | UpdatedLastName | 1995-01-01 | updated.email@email.com  | 555-555-5555 | UpdatedCity |
|           2 | Jane             | Smith           | 1985-08-22 | jane.smith@email.com     | 987-654-3210 | Delhi       |
|           3 | Bob              | Johnson         | 1995-02-10 | bob.johnson@email.com    | 555-123-4567 | Chennai     |
|           4 | Alice            | Williams        | 1988-11-30 | alice.williams@email.com | 321-654-9870 | Pune        |
|           5 | Charlie          | Brown           | 1992-07-18 | charlie.brown@email.com  | 777-888-9999 | Nagpur      |
|           6 | Emma             | Davis           | 1982-04-05 | emma.davis@email.com     | 111-222-3333 | Kolkata     |
|           7 | Michael          | Jones           | 1993-09-25 | michael.jones@email.com  | 444-555-6666 | Hydrabad    |
|           8 | Sophia           | Taylor          | 1987-06-12 | sophia.taylor@email.com  | 999-888-7777 | Chandigadh  |
|           9 | David            | Moore           | 1997-03-08 | david.moore@email.com    | 666-333-1111 | Kanpur      |
|          10 | Olivia           | Clark           | 1980-12-20 | olivia.clark@email.com   | 222-444-5555 | Jaypur      |
+-------------+------------------+-----------------+------------+--------------------------+--------------+-------------+
10 rows in set (0.00 sec)

mysql>
```

Retrieving Specific Attributes



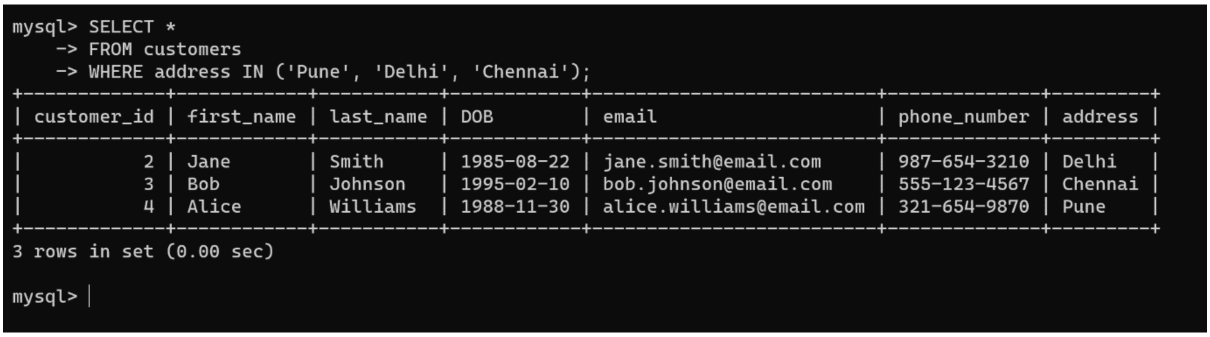
```
mysql> SELECT first_name, last_name, email, phone_number
    -> FROM customers
    -> WHERE customer_id = 1;
+------------------+-----------------+-------------------------+--------------+
| first_name       | last_name       | email                   | phone_number |
+------------------+-----------------+-------------------------+--------------+
| UpdatedFirstName | UpdatedLastName | updated.email@email.com | 555-555-5555 |
+------------------+-----------------+-------------------------+--------------+
1 row in set (0.00 sec)

mysql>
```

Retrieving Selected Rows

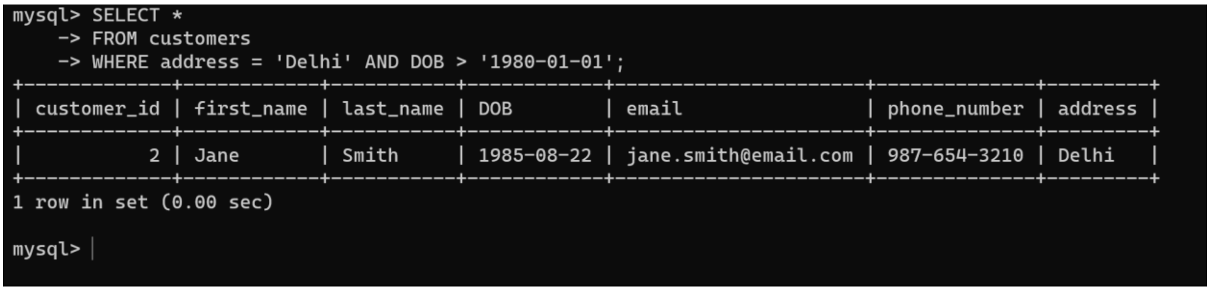


```
mysql> SELECT *
    -> FROM customers
    -> WHERE address = 'Delhi';
+-------------+------------+-----------+------------+----------------------+--------------+---------+
| customer_id | first_name | last_name | DOB        | email                | phone_number | address |
+-------------+------------+-----------+------------+----------------------+--------------+---------+
|           2 | Jane       | Smith     | 1985-08-22 | jane.smith@email.com | 987-654-3210 | Delhi   |
+-------------+------------+-----------+------------+----------------------+--------------+---------+
1 row in set (0.00 sec)

mysql>
```

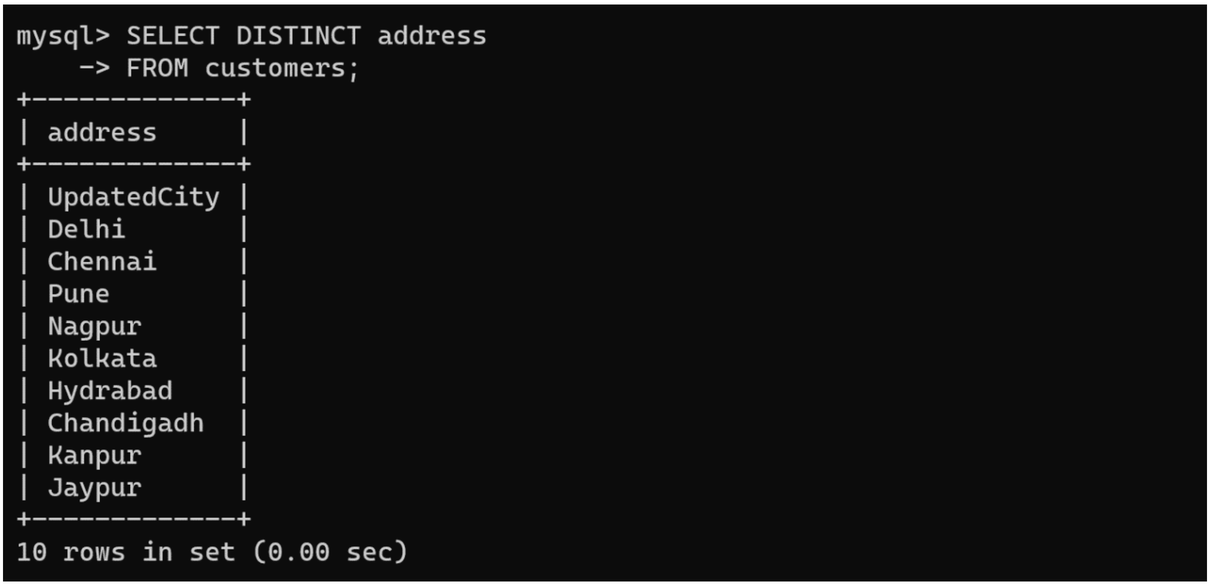
Filtering Data: IN, DISTINCT, AND, OR, IN, BETWEEN, LIKE, Column & table aliases



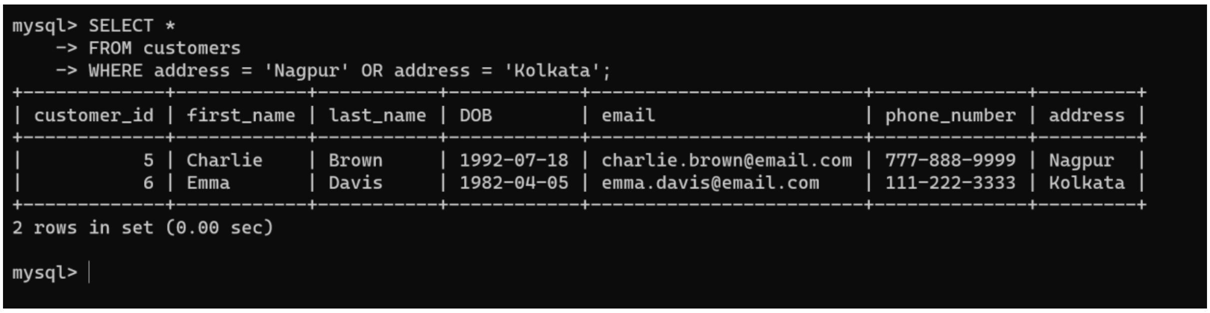
```
mysql> SELECT *
    -> FROM customers
    -> WHERE address IN ('Pune', 'Delhi', 'Chennai');
+-------------+------------+-----------+------------+--------------------------+--------------+---------+
| customer_id | first_name | last_name | DOB        | email                    | phone_number | address |
+-------------+------------+-----------+------------+--------------------------+--------------+---------+
|           2 | Jane       | Smith     | 1985-08-22 | jane.smith@email.com     | 987-654-3210 | Delhi   |
|           3 | Bob        | Johnson   | 1995-02-10 | bob.johnson@email.com    | 555-123-4567 | Chennai |
|           4 | Alice      | Williams  | 1988-11-30 | alice.williams@email.com | 321-654-9870 | Pune    |
+-------------+------------+-----------+------------+--------------------------+--------------+---------+
3 rows in set (0.00 sec)

mysql>
```



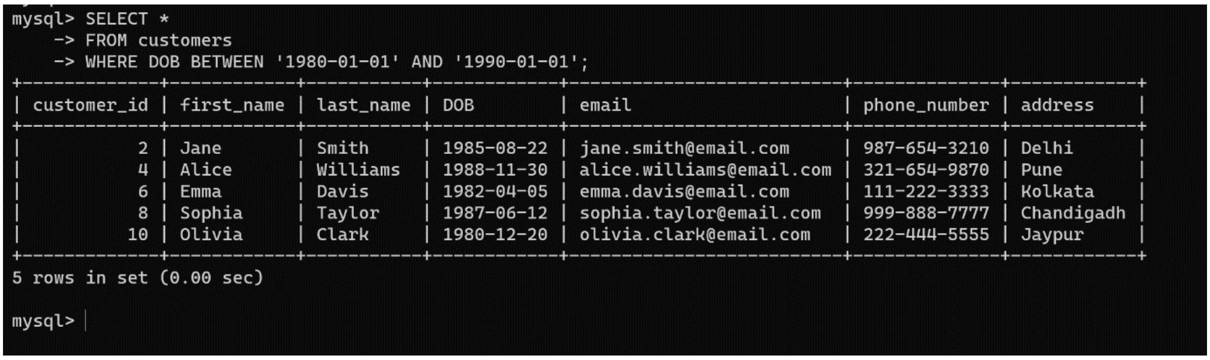
```
mysql> SELECT *
    -> FROM customers
    -> WHERE address = 'Delhi' AND DOB > '1980-01-01';
+-------------+------------+-----------+------------+----------------------+--------------+---------+
| customer_id | first_name | last_name | DOB        | email                | phone_number | address |
+-------------+------------+-----------+------------+----------------------+--------------+---------+
|           2 | Jane       | Smith     | 1985-08-22 | jane.smith@email.com | 987-654-3210 | Delhi   |
+-------------+------------+-----------+------------+----------------------+--------------+---------+
1 row in set (0.00 sec)

mysql>
```



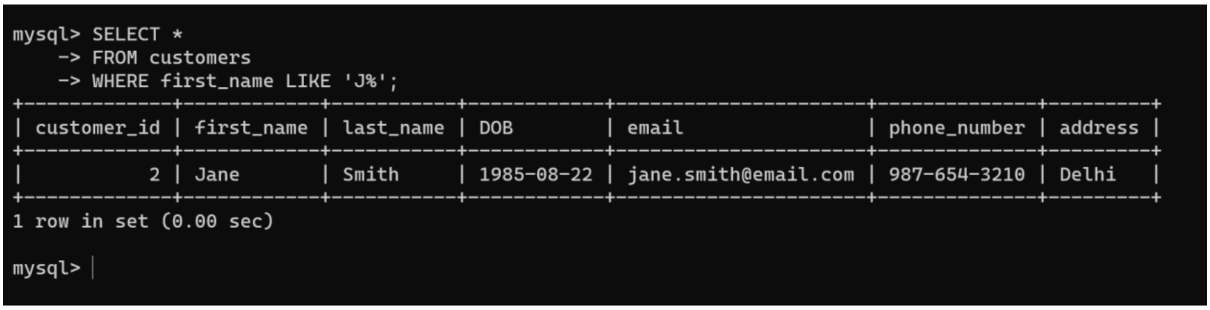
```
mysql> SELECT DISTINCT address
    -> FROM customers;
+-------------+
| address     |
+-------------+
| UpdatedCity |
| Delhi       |
| Chennai     |
| Pune        |
| Nagpur      |
| Kolkata     |
| Hydrabad    |
| Chandigadh  |
| Kanpur      |
| Jaypur      |
+-------------+
10 rows in set (0.00 sec)
```



```
mysql> SELECT *
    -> FROM customers
    -> WHERE address = 'Nagpur' OR address = 'Kolkata';
+-------------+------------+-----------+------------+-------------------------+--------------+---------+
| customer_id | first_name | last_name | DOB        | email                   | phone_number | address |
+-------------+------------+-----------+------------+-------------------------+--------------+---------+
|           5 | Charlie    | Brown     | 1992-07-18 | charlie.brown@email.com | 777-888-9999 | Nagpur  |
|           6 | Emma       | Davis     | 1982-04-05 | emma.davis@email.com    | 111-222-3333 | Kolkata |
+-------------+------------+-----------+------------+-------------------------+--------------+---------+
2 rows in set (0.00 sec)

mysql>
```

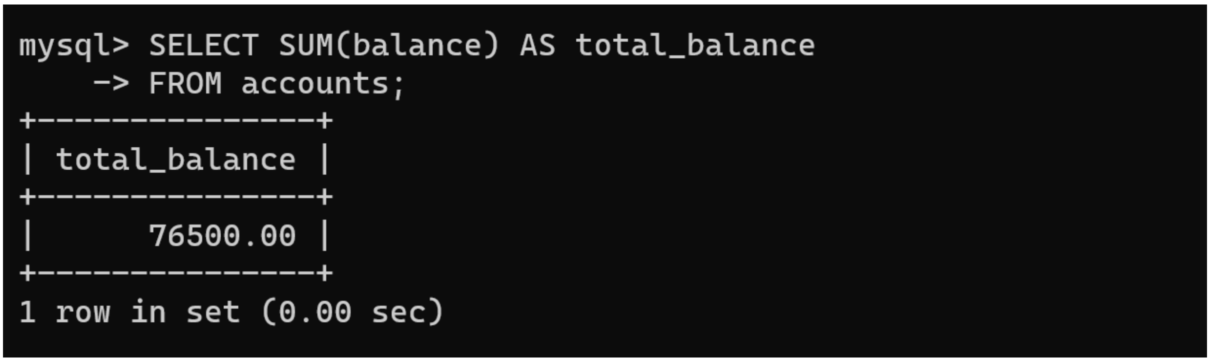


```
mysql> SELECT *
    -> FROM customers
    -> WHERE DOB BETWEEN '1980-01-01' AND '1990-01-01';
+-------------+------------+-----------+------------+--------------------------+--------------+------------+
| customer_id | first_name | last_name | DOB        | email                    | phone_number | address    |
+-------------+------------+-----------+------------+--------------------------+--------------+------------+
|           2 | Jane       | Smith     | 1985-08-22 | jane.smith@email.com     | 987-654-3210 | Delhi      |
|           4 | Alice      | Williams  | 1988-11-30 | alice.williams@email.com | 321-654-9870 | Pune       |
|           6 | Emma       | Davis     | 1982-04-05 | emma.davis@email.com     | 111-222-3333 | Kolkata    |
|           8 | Sophia     | Taylor    | 1987-06-12 | sophia.taylor@email.com  | 999-888-7777 | Chandigadh |
|          10 | Olivia     | Clark     | 1980-12-20 | olivia.clark@email.com   | 222-444-5555 | Jaypur     |
+-------------+------------+-----------+------------+--------------------------+--------------+------------+
5 rows in set (0.00 sec)

mysql>
```

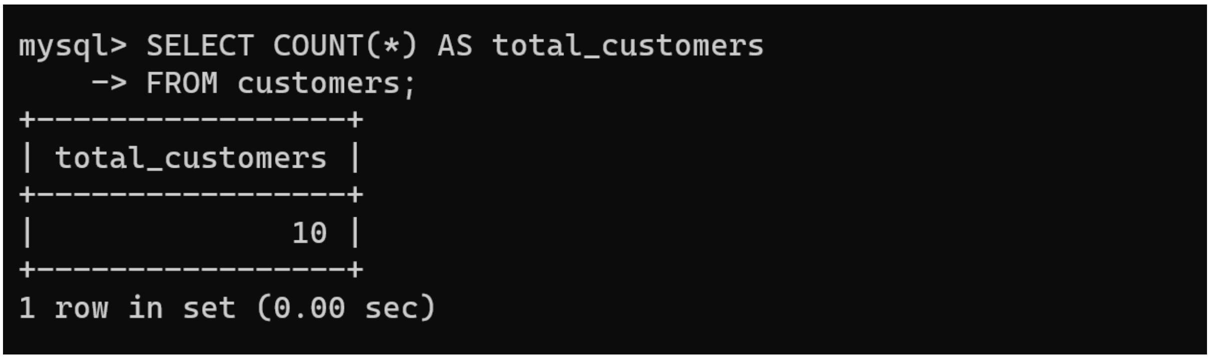


```
mysql> SELECT *
    -> FROM customers
    -> WHERE first_name LIKE 'J%';
+-------------+------------+-----------+------------+----------------------+--------------+---------+
| customer_id | first_name | last_name | DOB        | email                | phone_number | address |
+-------------+------------+-----------+------------+----------------------+--------------+---------+
|           2 | Jane       | Smith     | 1985-08-22 | jane.smith@email.com | 987-654-3210 | Delhi   |
+-------------+------------+-----------+------------+----------------------+--------------+---------+
1 row in set (0.00 sec)

mysql>
```

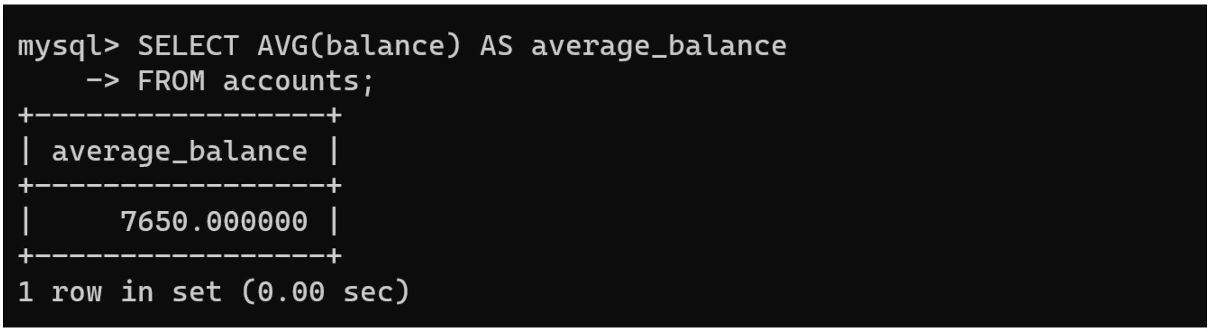
- Total Aggregations using SQL Queries



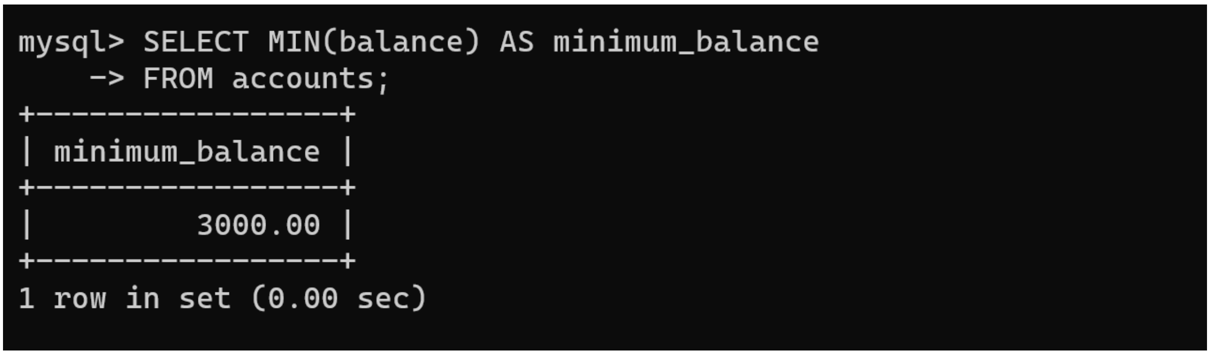
```
mysql> SELECT SUM(balance) AS total_balance
    -> FROM accounts;
+---------------+
| total_balance |
+---------------+
|      76500.00 |
+---------------+
1 row in set (0.00 sec)
```



```
mysql> SELECT COUNT(*) AS total_customers
    -> FROM customers;
+-----------------+
| total_customers |
+-----------------+
|              10 |
+-----------------+
1 row in set (0.00 sec)
```

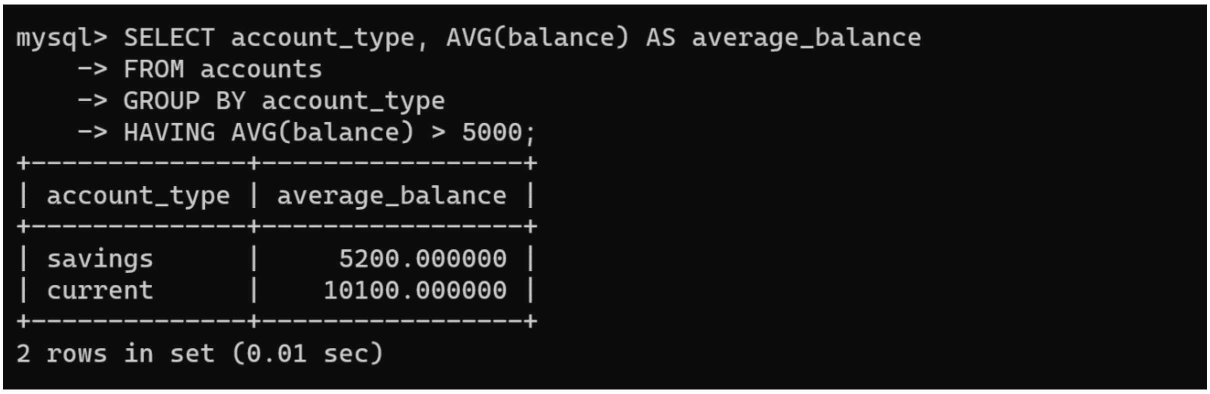


```
mysql> SELECT AVG(balance) AS average_balance
    -> FROM accounts;
+-----------------+
| average_balance |
+-----------------+
|     7650.000000 |
+-----------------+
1 row in set (0.00 sec)
```



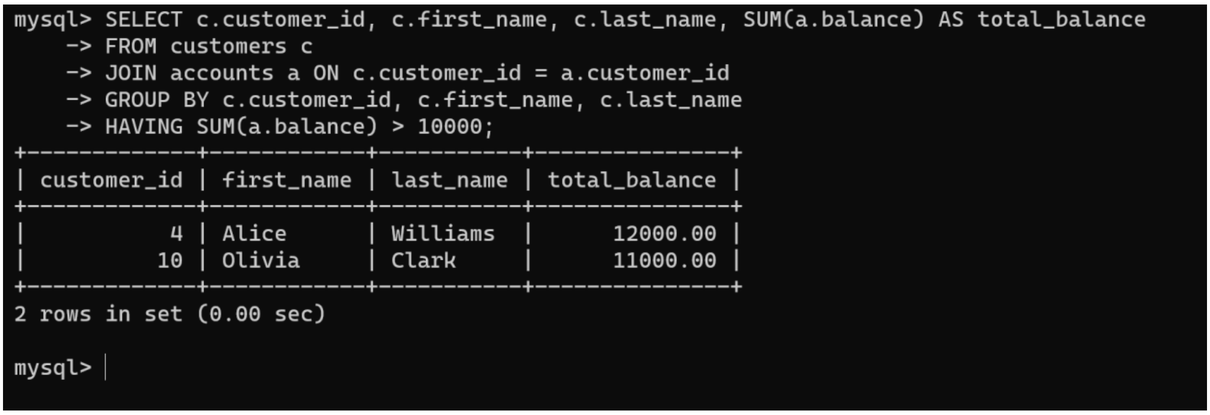
```
mysql> SELECT MIN(balance) AS minimum_balance
    -> FROM accounts;
+-----------------+
| minimum_balance |
+-----------------+
|         3000.00 |
+-----------------+
1 row in set (0.00 sec)
```

- Group By Aggregations using SQL Queries



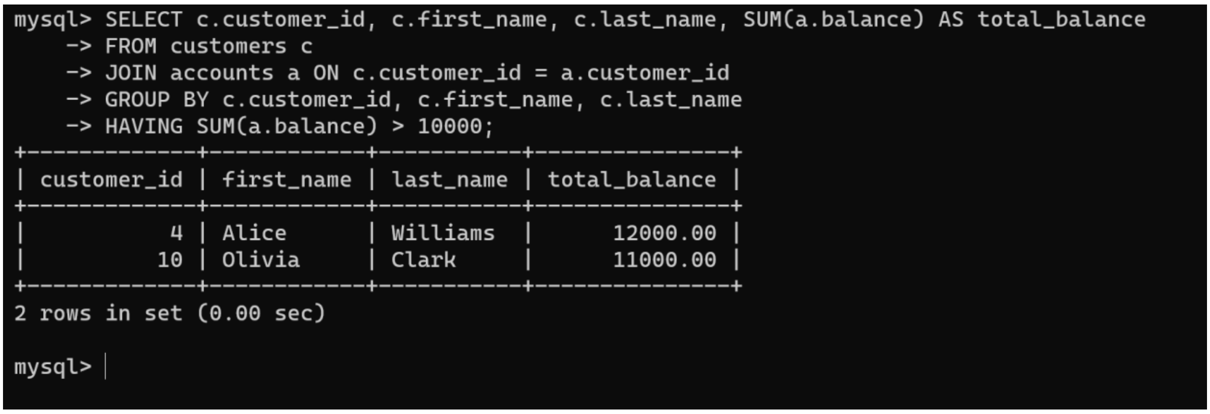
```
mysql> SELECT account_type, AVG(balance) AS average_balance
    -> FROM accounts
    -> GROUP BY account_type
    -> HAVING AVG(balance) > 5000;
+--------------+-----------------+
| account_type | average_balance |
+--------------+-----------------+
| savings      |     5200.000000 |
| current      |    10100.000000 |
+--------------+-----------------+
2 rows in set (0.01 sec)
```

- Filter Data based on Aggregated Results using Group By and Having



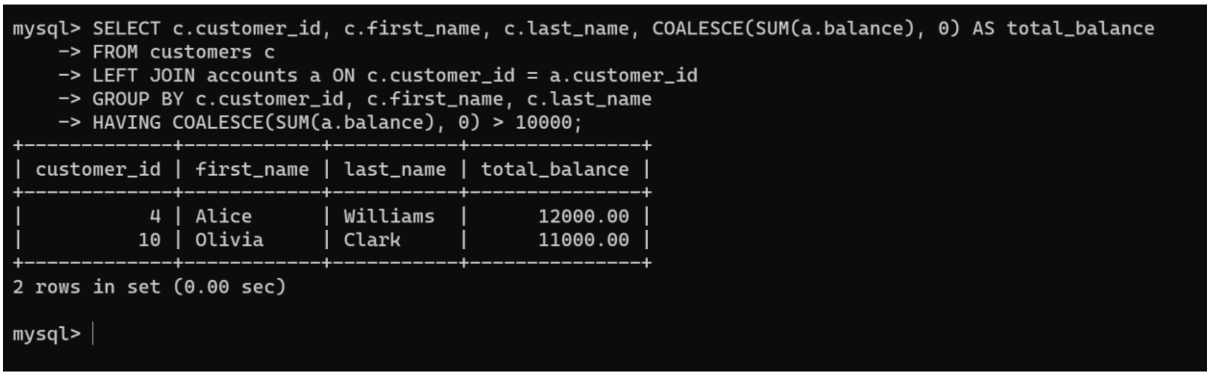
```
mysql> SELECT c.customer_id, c.first_name, c.last_name, SUM(a.balance) AS total_balance
    -> FROM customers c
    -> JOIN accounts a ON c.customer_id = a.customer_id
    -> GROUP BY c.customer_id, c.first_name, c.last_name
    -> HAVING SUM(a.balance) > 10000;
+-------------+------------+-----------+---------------+
| customer_id | first_name | last_name | total_balance |
+-------------+------------+-----------+---------------+
|           4 | Alice      | Williams  |      12000.00 |
|          10 | Olivia     | Clark     |      11000.00 |
+-------------+------------+-----------+---------------+
2 rows in set (0.00 sec)

mysql>
```

- Using an Inner Join



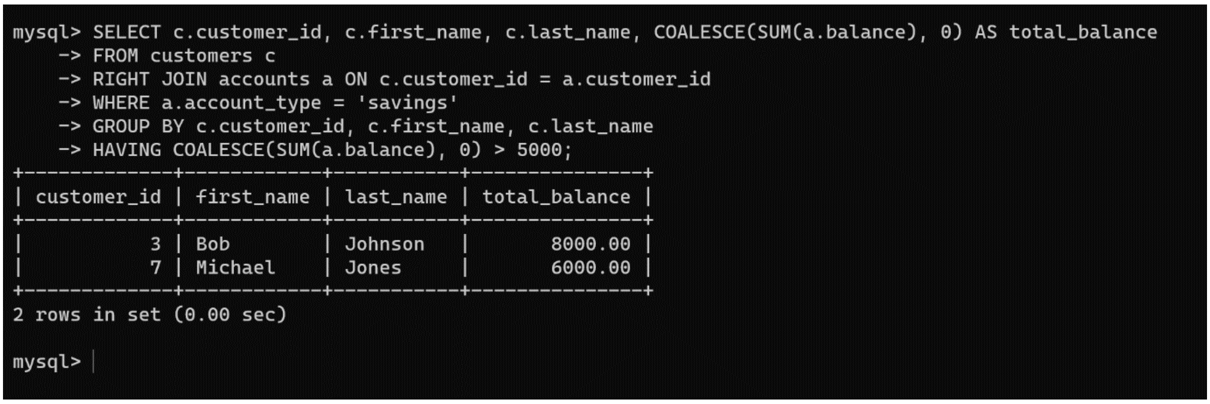
```
mysql> SELECT c.customer_id, c.first_name, c.last_name, SUM(a.balance) AS total_balance
    -> FROM customers c
    -> JOIN accounts a ON c.customer_id = a.customer_id
    -> GROUP BY c.customer_id, c.first_name, c.last_name
    -> HAVING SUM(a.balance) > 10000;
+-------------+------------+-----------+---------------+
| customer_id | first_name | last_name | total_balance |
+-------------+------------+-----------+---------------+
|           4 | Alice      | Williams  |      12000.00 |
|          10 | Olivia     | Clark     |      11000.00 |
+-------------+------------+-----------+---------------+
2 rows in set (0.00 sec)

mysql>
```

Using Left Join



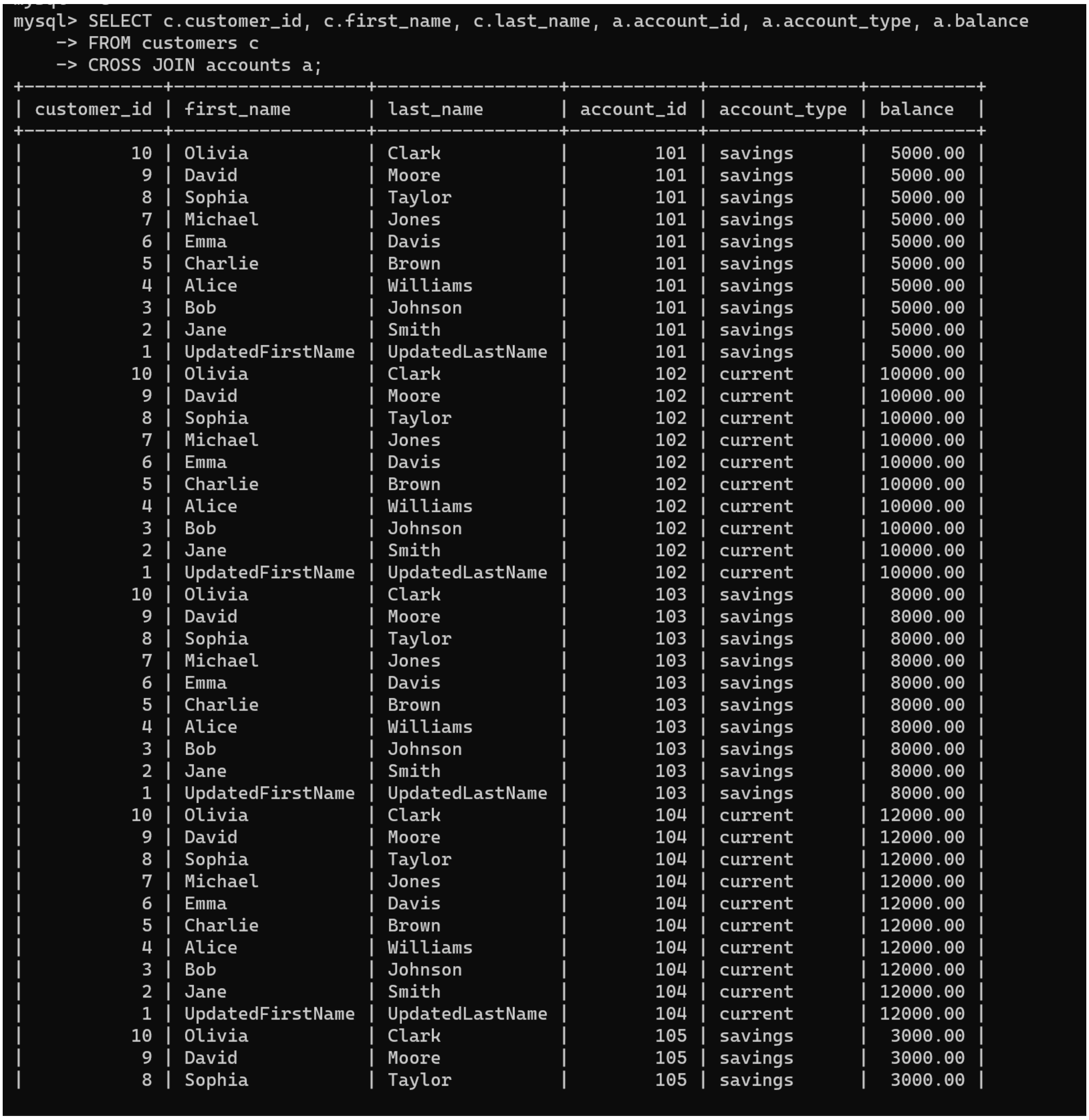
```
mysql> SELECT c.customer_id, c.first_name, c.last_name, COALESCE(SUM(a.balance), 0) AS total_balance
    -> FROM customers c
    -> LEFT JOIN accounts a ON c.customer_id = a.customer_id
    -> GROUP BY c.customer_id, c.first_name, c.last_name
    -> HAVING COALESCE(SUM(a.balance), 0) > 10000;
+-------------+------------+-----------+---------------+
| customer_id | first_name | last_name | total_balance |
+-------------+------------+-----------+---------------+
|           4 | Alice      | Williams  |      12000.00 |
|          10 | Olivia     | Clark     |      11000.00 |
+-------------+------------+-----------+---------------+
2 rows in set (0.00 sec)

mysql> 
```

Using Right Join

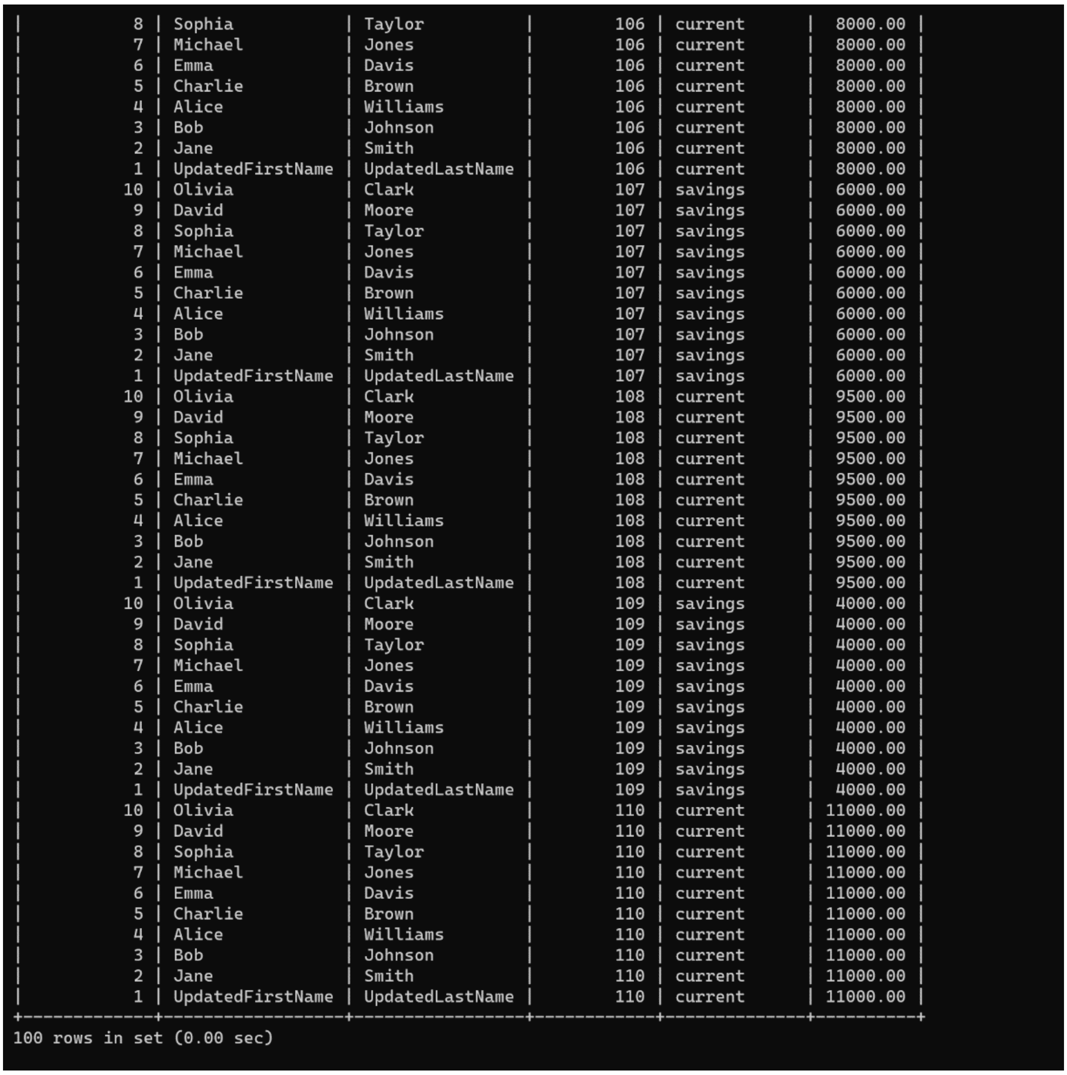


```
mysql> SELECT c.customer_id, c.first_name, c.last_name, COALESCE(SUM(a.balance), 0) AS total_balance
    -> FROM customers c
    -> RIGHT JOIN accounts a ON c.customer_id = a.customer_id
    -> WHERE a.account_type = 'savings'
    -> GROUP BY c.customer_id, c.first_name, c.last_name
    -> HAVING COALESCE(SUM(a.balance), 0) > 5000;
+-------------+------------+-----------+---------------+
| customer_id | first_name | last_name | total_balance |
+-------------+------------+-----------+---------------+
|           3 | Bob        | Johnson   |       8000.00 |
|           7 | Michael    | Jones     |       6000.00 |
+-------------+------------+-----------+---------------+
2 rows in set (0.00 sec)

mysql> 
```

- Using Cross Join

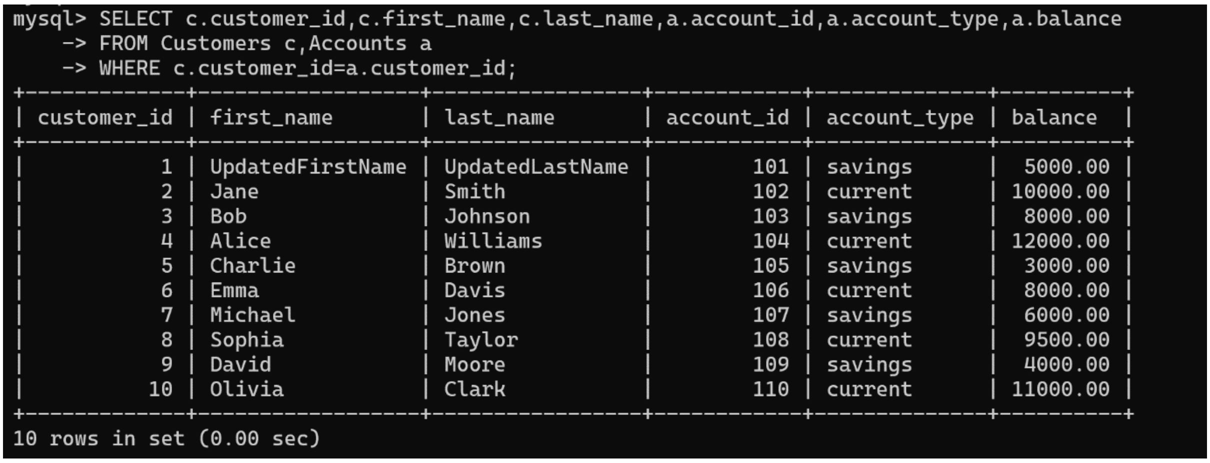


```
mysql> SELECT c.customer_id, c.first_name, c.last_name, a.account_id, a.account_type, a.balance
    -> FROM customers c
    -> CROSS JOIN accounts a;
+-------------+------------------+-----------------+------------+--------------+----------+
| customer_id | first_name       | last_name       | account_id | account_type | balance  |
+-------------+------------------+-----------------+------------+--------------+----------+
|          10 | Olivia           | Clark           |        101 | savings      |  5000.00 |
|           9 | David            | Moore           |        101 | savings      |  5000.00 |
|           8 | Sophia           | Taylor          |        101 | savings      |  5000.00 |
|           7 | Michael          | Jones           |        101 | savings      |  5000.00 |
|           6 | Emma             | Davis           |        101 | savings      |  5000.00 |
|           5 | Charlie          | Brown           |        101 | savings      |  5000.00 |
|           4 | Alice            | Williams        |        101 | savings      |  5000.00 |
|           3 | Bob              | Johnson         |        101 | savings      |  5000.00 |
|           2 | Jane             | Smith           |        101 | savings      |  5000.00 |
|           1 | UpdatedFirstName | UpdatedLastName |        101 | savings      |  5000.00 |
|          10 | Olivia           | Clark           |        102 | current      | 10000.00 |
|           9 | David            | Moore           |        102 | current      | 10000.00 |
|           8 | Sophia           | Taylor          |        102 | current      | 10000.00 |
|           7 | Michael          | Jones           |        102 | current      | 10000.00 |
|           6 | Emma             | Davis           |        102 | current      | 10000.00 |
|           5 | Charlie          | Brown           |        102 | current      | 10000.00 |
|           4 | Alice            | Williams        |        102 | current      | 10000.00 |
|           3 | Bob              | Johnson         |        102 | current      | 10000.00 |
|           2 | Jane             | Smith           |        102 | current      | 10000.00 |
|           1 | UpdatedFirstName | UpdatedLastName |        102 | current      | 10000.00 |
|          10 | Olivia           | Clark           |        103 | savings      |  8000.00 |
|           9 | David            | Moore           |        103 | savings      |  8000.00 |
|           8 | Sophia           | Taylor          |        103 | savings      |  8000.00 |
|           7 | Michael          | Jones           |        103 | savings      |  8000.00 |
|           6 | Emma             | Davis           |        103 | savings      |  8000.00 |
|           5 | Charlie          | Brown           |        103 | savings      |  8000.00 |
|           4 | Alice            | Williams        |        103 | savings      |  8000.00 |
|           3 | Bob              | Johnson         |        103 | savings      |  8000.00 |
|           2 | Jane             | Smith           |        103 | savings      |  8000.00 |
|           1 | UpdatedFirstName | UpdatedLastName |        103 | savings      |  8000.00 |
|          10 | Olivia           | Clark           |        104 | current      | 12000.00 |
|           9 | David            | Moore           |        104 | current      | 12000.00 |
|           8 | Sophia           | Taylor          |        104 | current      | 12000.00 |
|           7 | Michael          | Jones           |        104 | current      | 12000.00 |
|           6 | Emma             | Davis           |        104 | current      | 12000.00 |
|           5 | Charlie          | Brown           |        104 | current      | 12000.00 |
|           4 | Alice            | Williams        |        104 | current      | 12000.00 |
|           3 | Bob              | Johnson         |        104 | current      | 12000.00 |
|           2 | Jane             | Smith           |        104 | current      | 12000.00 |
|           1 | UpdatedFirstName | UpdatedLastName |        104 | current      | 12000.00 |
|          10 | Olivia           | Clark           |        105 | savings      |  3000.00 |
|           9 | David            | Moore           |        105 | savings      |  3000.00 |
|           8 | Sophia           | Taylor          |        105 | savings      |  3000.00 |
```



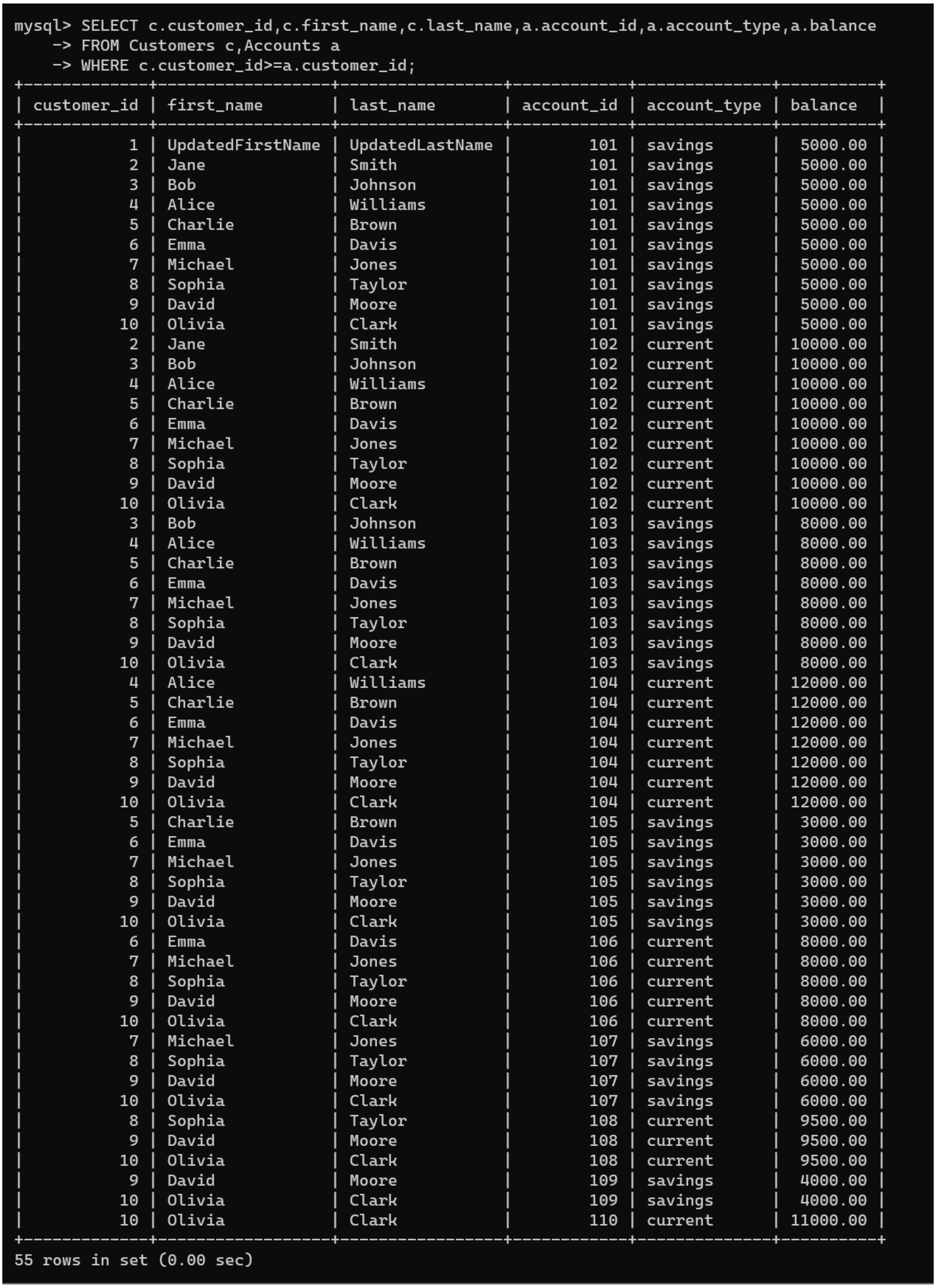
```
|           8 | Sophia           | Taylor          |        106 | current      |  8000.00 |
|           7 | Michael          | Jones           |        106 | current      |  8000.00 |
|           6 | Emma             | Davis           |        106 | current      |  8000.00 |
|           5 | Charlie          | Brown           |        106 | current      |  8000.00 |
|           4 | Alice            | Williams        |        106 | current      |  8000.00 |
|           3 | Bob              | Johnson         |        106 | current      |  8000.00 |
|           2 | Jane             | Smith           |        106 | current      |  8000.00 |
|           1 | UpdatedFirstName | UpdatedLastName |        106 | current      |  8000.00 |
|          10 | Olivia           | Clark           |        107 | savings      |  6000.00 |
|           9 | David            | Moore           |        107 | savings      |  6000.00 |
|           8 | Sophia           | Taylor          |        107 | savings      |  6000.00 |
|           7 | Michael          | Jones           |        107 | savings      |  6000.00 |
|           6 | Emma             | Davis           |        107 | savings      |  6000.00 |
|           5 | Charlie          | Brown           |        107 | savings      |  6000.00 |
|           4 | Alice            | Williams        |        107 | savings      |  6000.00 |
|           3 | Bob              | Johnson         |        107 | savings      |  6000.00 |
|           2 | Jane             | Smith           |        107 | savings      |  6000.00 |
|           1 | UpdatedFirstName | UpdatedLastName |        107 | savings      |  6000.00 |
|          10 | Olivia           | Clark           |        108 | current      |  9500.00 |
|           9 | David            | Moore           |        108 | current      |  9500.00 |
|           8 | Sophia           | Taylor          |        108 | current      |  9500.00 |
|           7 | Michael          | Jones           |        108 | current      |  9500.00 |
|           6 | Emma             | Davis           |        108 | current      |  9500.00 |
|           5 | Charlie          | Brown           |        108 | current      |  9500.00 |
|           4 | Alice            | Williams        |        108 | current      |  9500.00 |
|           3 | Bob              | Johnson         |        108 | current      |  9500.00 |
|           2 | Jane             | Smith           |        108 | current      |  9500.00 |
|           1 | UpdatedFirstName | UpdatedLastName |        108 | current      |  9500.00 |
|          10 | Olivia           | Clark           |        109 | savings      |  4000.00 |
|           9 | David            | Moore           |        109 | savings      |  4000.00 |
|           8 | Sophia           | Taylor          |        109 | savings      |  4000.00 |
|           7 | Michael          | Jones           |        109 | savings      |  4000.00 |
|           6 | Emma             | Davis           |        109 | savings      |  4000.00 |
|           5 | Charlie          | Brown           |        109 | savings      |  4000.00 |
|           4 | Alice            | Williams        |        109 | savings      |  4000.00 |
|           3 | Bob              | Johnson         |        109 | savings      |  4000.00 |
|           2 | Jane             | Smith           |        109 | savings      |  4000.00 |
|           1 | UpdatedFirstName | UpdatedLastName |        109 | savings      |  4000.00 |
|          10 | Olivia           | Clark           |        110 | current      | 11000.00 |
|           9 | David            | Moore           |        110 | current      | 11000.00 |
|           8 | Sophia           | Taylor          |        110 | current      | 11000.00 |
|           7 | Michael          | Jones           |        110 | current      | 11000.00 |
|           6 | Emma             | Davis           |        110 | current      | 11000.00 |
|           5 | Charlie          | Brown           |        110 | current      | 11000.00 |
|           4 | Alice            | Williams        |        110 | current      | 11000.00 |
|           3 | Bob              | Johnson         |        110 | current      | 11000.00 |
|           2 | Jane             | Smith           |        110 | current      | 11000.00 |
|           1 | UpdatedFirstName | UpdatedLastName |        110 | current      | 11000.00 |
+-------------+------------------+-----------------+------------+--------------+----------+
100 rows in set (0.00 sec)
```

Using an Equi Join



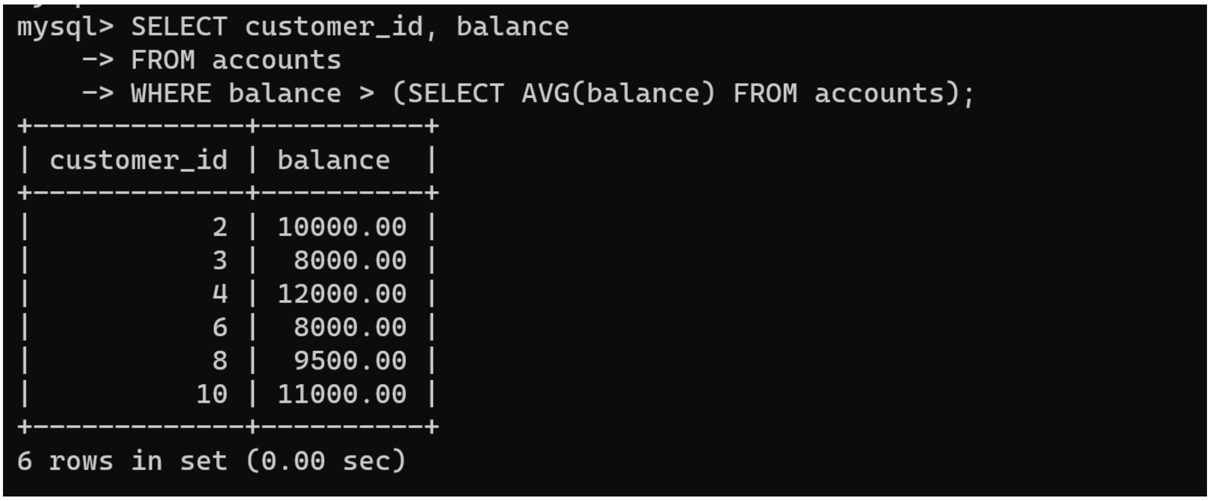
```
mysql> SELECT c.customer_id,c.first_name,c.last_name,a.account_id,a.account_type,a.balance
    -> FROM Customers c,Accounts a
    -> WHERE c.customer_id=a.customer_id;
+-------------+------------------+-----------------+------------+--------------+----------+
| customer_id | first_name       | last_name       | account_id | account_type | balance  |
+-------------+------------------+-----------------+------------+--------------+----------+
|           1 | UpdatedFirstName | UpdatedLastName |        101 | savings      |  5000.00 |
|           2 | Jane             | Smith           |        102 | current      | 10000.00 |
|           3 | Bob              | Johnson         |        103 | savings      |  8000.00 |
|           4 | Alice            | Williams        |        104 | current      | 12000.00 |
|           5 | Charlie          | Brown           |        105 | savings      |  3000.00 |
|           6 | Emma             | Davis           |        106 | current      |  8000.00 |
|           7 | Michael          | Jones           |        107 | savings      |  6000.00 |
|           8 | Sophia           | Taylor          |        108 | current      |  9500.00 |
|           9 | David            | Moore           |        109 | savings      |  4000.00 |
|          10 | Olivia           | Clark           |        110 | current      | 11000.00 |
+-------------+------------------+-----------------+------------+--------------+----------+
10 rows in set (0.00 sec)
```

- Using non Equi join



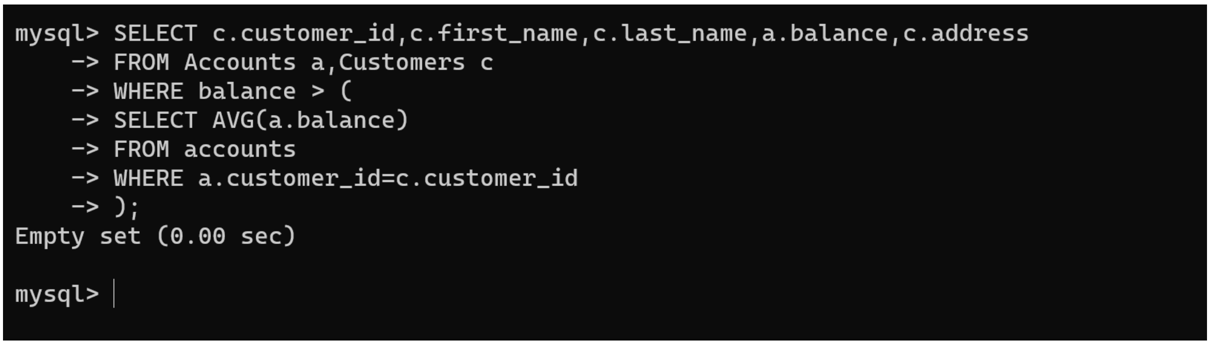
```
mysql> SELECT c.customer_id,c.first_name,c.last_name,a.account_id,a.account_type,a.balance
    -> FROM Customers c,Accounts a
    -> WHERE c.customer_id>=a.customer_id;
+-------------+------------------+-----------------+------------+--------------+----------+
| customer_id | first_name       | last_name       | account_id | account_type | balance  |
+-------------+------------------+-----------------+------------+--------------+----------+
|           1 | UpdatedFirstName | UpdatedLastName |        101 | savings      |  5000.00 |
|           2 | Jane             | Smith           |        101 | savings      |  5000.00 |
|           3 | Bob              | Johnson         |        101 | savings      |  5000.00 |
|           4 | Alice            | Williams        |        101 | savings      |  5000.00 |
|           5 | Charlie          | Brown           |        101 | savings      |  5000.00 |
|           6 | Emma             | Davis           |        101 | savings      |  5000.00 |
|           7 | Michael          | Jones           |        101 | savings      |  5000.00 |
|           8 | Sophia           | Taylor          |        101 | savings      |  5000.00 |
|           9 | David            | Moore           |        101 | savings      |  5000.00 |
|          10 | Olivia           | Clark           |        101 | savings      |  5000.00 |
|           2 | Jane             | Smith           |        102 | current      | 10000.00 |
|           3 | Bob              | Johnson         |        102 | current      | 10000.00 |
|           4 | Alice            | Williams        |        102 | current      | 10000.00 |
|           5 | Charlie          | Brown           |        102 | current      | 10000.00 |
|           6 | Emma             | Davis           |        102 | current      | 10000.00 |
|           7 | Michael          | Jones           |        102 | current      | 10000.00 |
|           8 | Sophia           | Taylor          |        102 | current      | 10000.00 |
|           9 | David            | Moore           |        102 | current      | 10000.00 |
|          10 | Olivia           | Clark           |        102 | current      | 10000.00 |
|           3 | Bob              | Johnson         |        103 | savings      |  8000.00 |
|           4 | Alice            | Williams        |        103 | savings      |  8000.00 |
|           5 | Charlie          | Brown           |        103 | savings      |  8000.00 |
|           6 | Emma             | Davis           |        103 | savings      |  8000.00 |
|           7 | Michael          | Jones           |        103 | savings      |  8000.00 |
|           8 | Sophia           | Taylor          |        103 | savings      |  8000.00 |
|           9 | David            | Moore           |        103 | savings      |  8000.00 |
|          10 | Olivia           | Clark           |        103 | savings      |  8000.00 |
|           4 | Alice            | Williams        |        104 | current      | 12000.00 |
|           5 | Charlie          | Brown           |        104 | current      | 12000.00 |
|           6 | Emma             | Davis           |        104 | current      | 12000.00 |
|           7 | Michael          | Jones           |        104 | current      | 12000.00 |
|           8 | Sophia           | Taylor          |        104 | current      | 12000.00 |
|           9 | David            | Moore           |        104 | current      | 12000.00 |
|          10 | Olivia           | Clark           |        104 | current      | 12000.00 |
|           5 | Charlie          | Brown           |        105 | savings      |  3000.00 |
|           6 | Emma             | Davis           |        105 | savings      |  3000.00 |
|           7 | Michael          | Jones           |        105 | savings      |  3000.00 |
|           8 | Sophia           | Taylor          |        105 | savings      |  3000.00 |
|           9 | David            | Moore           |        105 | savings      |  3000.00 |
|          10 | Olivia           | Clark           |        105 | savings      |  3000.00 |
|           6 | Emma             | Davis           |        106 | current      |  8000.00 |
|           7 | Michael          | Jones           |        106 | current      |  8000.00 |
|           8 | Sophia           | Taylor          |        106 | current      |  8000.00 |
|           9 | David            | Moore           |        106 | current      |  8000.00 |
|          10 | Olivia           | Clark           |        106 | current      |  8000.00 |
|           7 | Michael          | Jones           |        107 | savings      |  6000.00 |
|           8 | Sophia           | Taylor          |        107 | savings      |  6000.00 |
|           9 | David            | Moore           |        107 | savings      |  6000.00 |
|          10 | Olivia           | Clark           |        107 | savings      |  6000.00 |
|           8 | Sophia           | Taylor          |        108 | current      |  9500.00 |
|           9 | David            | Moore           |        108 | current      |  9500.00 |
|          10 | Olivia           | Clark           |        108 | current      |  9500.00 |
|           9 | David            | Moore           |        109 | savings      |  4000.00 |
|          10 | Olivia           | Clark           |        109 | savings      |  4000.00 |
|          10 | Olivia           | Clark           |        110 | current      | 11000.00 |
+-------------+------------------+-----------------+------------+--------------+----------+
55 rows in set (0.00 sec)
```

- Querying Data by Using Subqueries



```
mysql> SELECT customer_id, balance
    -> FROM accounts
    -> WHERE balance > (SELECT AVG(balance) FROM accounts);
+-------------+----------+
| customer_id | balance  |
+-------------+----------+
|           2 | 10000.00 |
|           3 |  8000.00 |
|           4 | 12000.00 |
|           6 |  8000.00 |
|           8 |  9500.00 |
|          10 | 11000.00 |
+-------------+----------+
6 rows in set (0.00 sec)
```

- Using Nested subqueries



```
mysql> SELECT c.customer_id,c.first_name,c.last_name,a.balance,c.address
    -> FROM Accounts a,Customers c
    -> WHERE balance > (
    -> SELECT AVG(a.balance)
    -> FROM accounts
    -> WHERE a.customer_id=c.customer_id
    -> );
Empty set (0.00 sec)

mysql>
```