1. Database Creation

```sql
CREATE DATABASE ecommerce;
use ecommerce;
```

2. Table Creation and Data Loading

```sql
CREATE TABLE customers ( customer_id VARCHAR(50) PRIMARY KEY,
customer_unique_id VARCHAR(50), customer_zip_prefix INT, customer_city
VARCHAR(100), customer_state VARCHAR(10));

LOAD DATA INFILE "C:/ProgramData/MySQL/MySQL Server
8.0/Uploads/customers.csv" INTO TABLE customers FIELDS TERMINATED
BY ',' ENCLOSED BY "" LINES TERMINATED BY '\n' IGNORE 1 ROWS
(customer_id, customer_unique_id, customer_zip_prefix, customer_city,
customer_state);

CREATE TABLE orders (order_id VARCHAR(50) PRIMARY KEY,
customer_id VARCHAR(50), order_status VARCHAR(20),
order_purchase_timestamp DATETIME, order_approved_at DATETIME,
order_delivered_carrier_date DATETIME, order_delivered_customer_date
DATETIME, order_estimated_delivery_date DATETIME,FOREIGN KEY
(customer_id) REFERENCES customers(customer_id));

ALTER TABLE orders ADD COLUMN customer_state VARCHAR(10);

LOAD DATA INFILE "C:/ProgramData/MySQL/MySQL Server
8.0/Uploads/orders.csv" INTO TABLE orders FIELDS TERMINATED BY ','
ENCLOSED BY "" LINES TERMINATED BY '\n' IGNORE 1 ROWS (order_id,
customer_id, order_status, @purchase_ts, @approved_at, @delivered_carrier,
@delivered_customer, @estimated_delivery, customer_state) SET
order_purchase_timestamp     = STR_TO_DATE(@purchase_ts, '%d-%m-%Y
%H:%i'),
order_approved_at = STR_TO_DATE(@approved_at, '%d-%m-%Y %H:%i'),
order_delivered_carrier_date  = STR_TO_DATE(NULLIF(@delivered_carrier,''),
'%d-%m-%Y %H:%i'), order_delivered_customer_date =
STR_TO_DATE(NULLIF(@delivered_customer,''), '%d-%m-%Y %H:%i'),
order_estimated_delivery_date =
STR_TO_DATE(NULLIF(@estimated_delivery,''), '%d-%m-%Y %H:%i');
```

```
mysql> use ecommerce;
Database changed
mysql> show tables;
Empty set (0.00 sec)

mysql> CREATE TABLE customers (
    ->     customer_id VARCHAR(50) PRIMARY KEY,
    ->     customer_unique_id VARCHAR(50),
    ->     customer_zip_prefix INT,
    ->     customer_city VARCHAR(100),
    ->     customer_state VARCHAR(10)
    -> );
Query OK, 0 rows affected (0.04 sec)

mysql> LOAD DATA INFILE "C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/customers.csv"
    -> INTO TABLE customers
    -> FIELDS TERMINATED BY ','
    -> ENCLOSED BY '"'
    -> LINES TERMINATED BY '\n'
    -> IGNORE 1 ROWS
    -> (customer_id, customer_unique_id, customer_zip_prefix, customer_city, customer_state);
Query OK, 10000 rows affected (0.36 sec)
Records: 10000  Deleted: 0  Skipped: 0  Warnings: 0

mysql> CREATE TABLE orders (
    ->     order_id VARCHAR(50) PRIMARY KEY,
    ->     customer_id VARCHAR(50),
    ->     order_status VARCHAR(20),
    ->     order_purchase_timestamp DATETIME,
    ->     order_approved_at DATETIME,
    ->     order_delivered_carrier_date DATETIME,
    ->     order_delivered_customer_date DATETIME,
    ->     order_estimated_delivery_date DATETIME,
    ->     FOREIGN KEY (customer_id) REFERENCES customers(customer_id)
    -> );
Query OK, 0 rows affected (0.06 sec)
mysql> LOAD DATA INFILE "C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/orders.csv"
    -> INTO TABLE orders
    -> FIELDS TERMINATED BY ','
    -> ENCLOSED BY '"'
    -> LINES TERMINATED BY '\n'
    -> IGNORE 1 ROWS
    -> (order_id, customer_id, order_status,
    -> @purchase_ts, @approved_at, @delivered_carrier, @delivered_customer, @estimated_delivery, customer_state)
    -> SET
    -> order_purchase_timestamp       = STR_TO_DATE(@purchase_ts, '%d-%m-%Y %H:%i'),
    -> order_approved_at              = STR_TO_DATE(@approved_at, '%d-%m-%Y %H:%i'),
    -> order_delivered_carrier_date   = STR_TO_DATE(NULLIF(@delivered_carrier,''), '%d-%m-%Y %H:%i'),
    -> order_delivered_customer_date = STR_TO_DATE(NULLIF(@delivered_customer,''), '%d-%m-%Y %H:%i'),
    -> order_estimated_delivery_date = STR_TO_DATE(NULLIF(@estimated_delivery,''), '%d-%m-%Y %H:%i');
Query OK, 971 rows affected (0.13 sec)
Records: 971  Deleted: 0  Skipped: 0  Warnings: 0
```

3. Data Retrieval Queries

SELECT * FROM customers LIMIT 10;

```
mysql> SELECT * FROM customers LIMIT 10;
+------------------+------------------+---------------------+------------------+----------------+
| customer_id      | customer_unique_id | customer_zip_prefix | customer_city    | customer_state |
+------------------+------------------+---------------------+------------------+----------------+
| f4117407665ac33275130 | 7e0516b486e92ed3f3afdd6d1276cfbd |               35540 | oliveira         | MG             |
| 33b2d0ec8c69fc70ef768 | fa30145b07cad8e972bea351a65216f4 |               13106 | campinas         | SP             |
| 413e19704b3867c369d3a | e57a935f49ffd73b93c18eaaa04efa84 |                5387 | sao paulo        | SP             |
| 4993879adaa91c518f68c | 5616f75d22507069b5383854a1d8c414 |               31060 | belo horizonte   | MG             |
| fde13ddaa7b8e385af919 | 866c923cde750dfc8cfbcf9d5ced0ee4 |               25903 | mage             | RJ             |
| ca77254dbc47f4ea358b2 | 392c8818b71b14227a7c701e7d54a3a1 |               13635 | pirassununga     | SP             |
| 83c3d1d1e81c616e321e8 | 1b9872e035e88fc720548cc74a815a46 |               22210 | rio de janeiro   | RJ             |
| 4231742e3c5396b333b88 | aaf46bd4e1ad43275a5a20bd485e7661 |               11440 | guaruja          | SP             |
| b66e998f67b09e7b11375 | 431af5c5638973ed6e431618f318a0a2 |               84040 | ponta grossa     | PR             |
| f1d555a582504a4058f4c | 442bdd695caba6183fc44d6cfdd4f094 |                5857 | sao paulo        | SP             |
+------------------+------------------+---------------------+------------------+----------------+
10 rows in set (0.00 sec)
```

SELECT * FROM orders WHERE order_status = 'delivered' LIMIT 10;

```
mysql> SELECT * FROM orders WHERE order_status = 'delivered' LIMIT 10;
+------------------+------------------+--------------+----------------------+---------------------+------------------------------+-------------------------------+---------------
| order_id         | customer_id      | order_status | order_purchase_timestamp | order_approved_at | order_delivered_carrier_date | order_delivered_customer_date | order_estima
ted_delivery_date | customer_state |
+------------------+------------------+--------------+----------------------+---------------------+------------------------------+-------------------------------+---------------
| 008c3a655c66f4d92370d0d422732f69 | f9f9943ef9d29a86f10de3b43cd84356 | delivered | 2018-03-04 23:15:00 | 2018-03-06 04:08:00 | 2018-03-07 00:32:00 | 2018-03-09 20:27:00 | 2018-03-15 0
            | SP |
| 00c405bd71187154a7846862f585a9d4 | 1ab52508d3c58d96241850142347b75f | delivered | 2017-10-23 14:59:00 | 2017-10-23 15:14:00 | 2017-10-25 13:30:00 | 2017-10-31 18:47:00 | 2017-11-17 0
            | BA |
| 00d88c00221ce96a1cfcaca9f2fceb3b | 2726ee187e4908c9683ac2a8a0424af1 | delivered | 2018-03-06 23:02:00 | 2018-03-06 23:15:00 | 2018-03-08 20:50:00 | 2018-03-28 15:49:00 | 2018-03-28 0
            | RJ |
| 00f2a3509bd600bd1a06a48353788d93 | 37dafcdee86df7843f93d4b4d5325dde | delivered | 2018-02-25 12:08:00 | 2018-02-25 12:29:00 | 2018-02-28 15:34:00 | 2018-03-01 16:58:00 | 2018-03-26 0
            | SP |
| 01074135a88ffa5978eaadfc7f482f2b | acc1272df0c1c3d973ccb5be09d0ab41 | delivered | 2018-03-30 10:53:00 | 2018-03-30 11:47:00 | 2018-04-02 23:06:00 | 2018-04-17 17:29:00 | 2018-04-24 0
            | MG |
| 0121cfa7c946e6589f50d7012d3eb5eb | 4797fb67b3991c9513486658f6d694fd | delivered | 2017-08-30 11:47:00 | 2017-08-30 12:50:00 | 2017-08-31 21:36:00 | 2017-09-06 20:06:00 | 2017-09-26 0
            | SP |
| 01633cfec0376ac9f2606e271ede5574 | 7511d7ebaabaa2f1e5b75763fac193c9 | delivered | 2017-02-23 12:10:00 | 2017-02-24 02:45:00 | 2017-03-01 16:14:00 | 2017-03-16 10:24:00 | 2017-04-05 0
            | BA |
| 02b73712c7944322d0b5a314f2424ee4 | d9778e3e408e8c54bdb818ab6bdccc39 | delivered | 2017-09-16 10:25:00 | 2017-09-16 11:03:00 | 2017-09-18 18:03:00 | 2017-09-26 21:42:00 | 2017-10-06 0
            | RJ |
| 02bee300cb834a5d334ae42fdc325e7a | 9172f54a6e979ee28aaaada718189c9b | delivered | 2018-06-19 17:51:00 | 2018-06-19 18:22:00 | 2018-06-20 14:07:00 | 2018-06-21 19:11:00 | 2018-06-29 0
            | SP |
| 02c6f38cbd2d15df19cf2621019823fd | 2cd1a450888a4cc3d4b8c5ed6482fe47 | delivered | 2017-07-06 09:08:00 | 2017-07-07 02:55:00 | 2017-07-11 20:32:00 | 2017-07-18 18:42:00 | 2017-08-01 0
            | RS |
+------------------+------------------+--------------+----------------------+---------------------+------------------------------+-------------------------------+---------------
10 rows in set (0.00 sec)
```

4. Aggregate function

SELECT AVG(DATEDIFF(order_delivered_customer_date, order_purchase_timestamp)) AS avg_delivery_days FROM orders WHERE order_delivered_customer_date IS NOT NULL;

```
mysql> SELECT AVG(DATEDIFF(order_delivered_customer_date, order_purchase_timestamp)) AS avg_delivery_days FROM orders WHERE order_delivered_customer_date IS NOT NULL;
+-------------------+
| avg_delivery_days |
+-------------------+
|           18.1392 |
+-------------------+
1 row in set (0.01 sec)
```

SELECT o.customer_id, SUM(DATEDIFF(o.order_delivered_customer_date, o.order_purchase_timestamp)) AS total_delivery_days FROM orders o WHERE o.order_delivered_customer_date IS NOT NULL GROUP BY o.customer_id ORDER BY total_delivery_days DESC LIMIT 10;

```
mysql> SELECT o.customer_id, SUM(DATEDIFF(o.order_delivered_customer_date, o.order_purchase_timestamp)) AS total_delivery_days FROM orders o WHERE o.order_delivered_customer_date IS NOT NULL GROUP BY o.customer_id ORDER BY total_delivery_days DESC LIMIT 10;
+----------------------------------+---------------------+
| customer_id                      | total_delivery_days |
+----------------------------------+---------------------+
| 95446917717bb58d553d107d0f1668f6 |                 767 |
| 9a6650bf502bb3d549c86dd61b38b02  |                 767 |
| 7185fdbf483003e78b65e2571d89976f |                 553 |
| 1e0918f0d58bd46e2465857831ec892c |                 463 |
| 1f9d7eb9953ad379f11be30ae9dda416 |                 453 |
| 16c4024b31236bbdb509f655a45b4969 |                 424 |
| 2b99e152f2351410951c503a2f6a2d7e |                 358 |
| c438793f5bfa6de0ee35371740b40bb5 |                 354 |
| 48c2928ba35098ca096267d9dbe467b4 |                 321 |
| 50bb775cd30a21ae108d4866abb6d9df |                 277 |
+----------------------------------+---------------------+
10 rows in set (0.01 sec)
```

5. Joins

SELECT o.order_id, c.customer_city, o.order_status FROM orders o JOIN customers c ON o.customer_id = c.customer_id WHERE c.customer_city = 'Sao Paulo';

```
mysql> SELECT o.order_id, c.customer_city, o.order_status FROM orders o JOIN customers c ON o.customer_id = c.customer_id WHERE c.customer_city = 'Sao Paulo';
+----------------------------------+---------------+--------------+
| order_id                         | customer_city | order_status |
+----------------------------------+---------------+--------------+
| 00f2a3509bd600bd1a06a48353788d93 | sao paulo     | delivered    |
| 02bee300cb834a5d334ae42fdc325e7a | sao paulo     | delivered    |
| 02c8da4642d8bb546d022a0701ea1b5a | sao paulo     | delivered    |
| 05522f28f3be3d5e7ef9f09cc0ac35ba | sao paulo     | delivered    |
| 07bec24c128f1f4047bfc582732c1d9d | sao paulo     | delivered    |
| 0b736121c8d0bffe6c9e592d6f91ba5c | sao paulo     | delivered    |
| 0c78ccb9fbc7e1d41165489050f6b748 | sao paulo     | delivered    |
| 0d01eea244609b22f49983e36c80c89c | sao paulo     | delivered    |
| 109294a0d68947b6b49c0a59a8f951cd | sao paulo     | delivered    |
| 14a92ecd0503cd0c9f6cfb0aea76dfa7 | sao paulo     | delivered    |
| 15d2b3dbcf33db614663846c65954138 | sao paulo     | delivered    |
| 17dc1e21997af8e93c86d7f7db02565f | sao paulo     | delivered    |
| 18972fa50ade81fa4f43586d2a26992f | sao paulo     | delivered    |
| 191a21c0a0934fdb7dcd56c6b28a8682 | sao paulo     | delivered    |
| 1aebe3f95567c145e96f6139896e6ea6 | sao paulo     | delivered    |
| 1dde4ac4444355c43b97d058a89e45bf | sao paulo     | delivered    |
| 1ed7a9f105bb93051eb43d410118a2f1 | sao paulo     | delivered    |
| 216c576eda21cb85b7b30d4668db4f91 | sao paulo     | delivered    |
| 23eb2da1dca08746d9fafba58255512f | sao paulo     | delivered    |
| 2882e815bbb59314e58194adf2fe61e3 | sao paulo     | delivered    |
| 28c35e27d64425be0368e275997f7779 | sao paulo     | delivered    |
| 2bc76dc101f9fa63d195e341cd11a649 | sao paulo     | canceled     |
| 2c06e80ee31e3bc878d17d0c6abb8f4c | sao paulo     | delivered    |
| 31c2a1051b9b9899d82d9b980ec8775d | sao paulo     | delivered    |
| 344d7792475d51c5c3b9d41758ef8f44 | sao paulo     | delivered    |
| 36b8c4e12c328ee0e0f34e9ef635852a | sao paulo     | delivered    |
| 3c31676dda1c2731a56d31f4157f72b4 | sao paulo     | delivered    |
| 3d8548cd4cec4412f9007bf10e67b70f | sao paulo     | delivered    |
| 3e8c191415aece16ba1ac896f535b484 | sao paulo     | shipped      |
| 3f27ed06b2513b7e6cad3d148e049bac | sao paulo     | delivered    |
| 41139489fb8433d34419f648aa690815 | sao paulo     | delivered    |
| 42ee4f991900767ba353278c7c4f4df3 | sao paulo     | delivered    |
| 43a23a9a05a87ff4d46b5b18829fe9ae | sao paulo     | delivered    |
| 446461e627059dcc66c0d83df1d3fadf | sao paulo     | delivered    |
| 4652e6a9e9b65b2e3304630e1f185939 | sao paulo     | delivered    |
| 465b896aa34a4d4f8c359165ee6f066c | sao paulo     | delivered    |
| 4970ecf64d47def5d7c4c4b39b7ce8d1 | sao paulo     | delivered    |
| 499a762fa72fde835e39b03db3b95cbf | sao paulo     | delivered    |
| 4a46b5e1fafd4a6ab3f773494ba1b331 | sao paulo     | delivered    |
| 4ab99aa84c8140d406cbdf001bf1bbd6 | sao paulo     | delivered    |
| 4f22cd3d78d124f7ac060a3171493ef4 | sao paulo     | delivered    |
| 519b875e24ac4f5060eda1fa6cd6b3bd | sao paulo     | delivered    |
| 52628d72feaca84428e9d902d3985605 | sao paulo     | delivered    |
| 553cd2acd876bcd93f9d3fcec45495ca | sao paulo     | delivered    |
```

SELECT o.order_id, c.customer_city, o.order_status FROM orders o INNER JOIN customers c ON o.customer_id = c.customer_id LIMIT 10;

```
mysql> SELECT o.order_id, c.customer_city, o.order_status FROM orders o INNER JOIN customers c ON o.customer_id = c.customer_id LIMIT 10;
+----------------------------------+------------------+--------------+
| order_id                         | customer_city    | order_status |
+----------------------------------+------------------+--------------+
| 008c3a655c66f4d92370d0d422732f69 | sorocaba         | delivered    |
| 00c405bd71187154a7846862f585a9d4 | feira de santana | delivered    |
| 00d88c00221ce96a1cfcaca9f2fceb3b | volta redonda    | delivered    |
| 00daac8efd71674d62356c2a306d1e4c | dom joaquim      | unavailable  |
| 00f2a3509bd600bd1a06a48353788d93 | sao paulo        | delivered    |
| 01074135a88ffa5978eaadfc7f482f2b | montalvania      | delivered    |
| 0121cfa7c946e6589f50d7012d3eb5eb | lins             | delivered    |
| 01633cfec0376ac9f2606e271ede5574 | coribe           | delivered    |
| 02b73712c7944322d0b5a314f2424ee4 | rio de janeiro   | delivered    |
| 02bee300cb834a5d334ae42fdc325e7a | sao paulo        | delivered    |
+----------------------------------+------------------+--------------+
10 rows in set (0.00 sec)
```

SELECT c.customer_id, o.order_id FROM customers c LEFT JOIN orders o ON c.customer_id = o.customer_id LIMIT 10;

```
mysql> SELECT c.customer_id, o.order_id FROM customers c LEFT JOIN orders o ON c.customer_id = o.customer_id LIMIT 10;
+----------------------------------+----------------------------------+
| customer_id                      | order_id                         |
+----------------------------------+----------------------------------+
| 000598caf2ef4117407665ac33275130 | 9b961b894e797f63622137ff7eb1c1af |
| 0009a69b72033b2d0ec8c69fc70ef768 | 048beca6ccda094fb80bbc704d7c493d |
| 001028b78fd413e19704b3867c369d3a | NULL                             |
| 00146ad30454993879adaa91c518f68c | NULL                             |
| 0015f7887e2fde13ddaa7b8e385af919 | NULL                             |
| 0018f7fde63ca77254dbc47f4ea358b2 | 7ad292313f72d59700c72169ba543021 |
| 00302a0b99783c3d1d1e81c616e321e8 | NULL                             |
| 00314f95a054231742e3c5396b333b88 | NULL                             |
| 0031abfb953b66e998f67b09e7b11375 | NULL                             |
| 0037d14e53af1d555a582504a4058f4c | NULL                             |
+----------------------------------+----------------------------------+
10 rows in set (0.00 sec)
```

SELECT o.order_id, o.customer_id, o.order_status, c.customer_unique_id FROM orders o RIGHT JOIN customers c ON o.customer_id = c.customer_id LIMIT 20;

```
mysql> SELECT o.order_id, o.customer_id, o.order_status, c.customer_unique_id FROM orders o RIGHT JOIN customers c ON o.customer_id = c.customer_id LIMIT 20;
+----------------------------------+----------------------------------+--------------+----------------------------------+
| order_id                         | customer_id                      | order_status | customer_unique_id               |
+----------------------------------+----------------------------------+--------------+----------------------------------+
| 9b961b894e797f63622137ff7eb1c1af | 000598caf2ef4117407665ac33275130 | delivered    | 7e0516b486e92ed3f3afdd6d1276cfbd |
| 048beca6ccda094fb80bbc704d7c493d | 0009a69b72033b2d0ec8c69fc70ef768 | delivered    | fa30145b07cad8e972bea351a65216f4 |
| NULL                             | NULL                             | NULL         | e57a935f49ffd73b93c18eaaa04efa84 |
| NULL                             | NULL                             | NULL         | 5616f75d22507069b5383854a1d8c414 |
| NULL                             | NULL                             | NULL         | 866c923cde750dfc8cfbcf9d5ced0ee4 |
| 7ad292313f72d59700c72169ba543021 | 0018f7fde63ca77254dbc47f4ea358b2 | delivered    | 392c8818b71b14227a7c701e7d54a3a1 |
| NULL                             | NULL                             | NULL         | 1b9872e035e88fc720548cc74a815a46 |
| NULL                             | NULL                             | NULL         | aaf46bd4e1ad43275a5a20bd485e7661 |
| NULL                             | NULL                             | NULL         | 431af5c5638973ed6e431618f318a0a2 |
| NULL                             | NULL                             | NULL         | 442bdd695caba6183fc44d6cfdd4f094 |
| NULL                             | NULL                             | NULL         | 8f20ece0099d6e5c22c1fd0c24a1e681 |
| NULL                             | NULL                             | NULL         | 96d0aa18ee946b81f6b78e07830194a2 |
| NULL                             | NULL                             | NULL         | 7bf845014243c08bdcea071d6981303e |
| NULL                             | NULL                             | NULL         | 0a9854e7028c74302d0963fa56e77a18 |
| NULL                             | NULL                             | NULL         | fd03997c82649affc061d275ddf1f3d9 |
| NULL                             | NULL                             | NULL         | dff41d762e4e7b68b73af7203a429072 |
| NULL                             | NULL                             | NULL         | f794c59a46dc4872d97d173c1b51525a |
| NULL                             | NULL                             | NULL         | 52b088042a61c6a03ba2027a6dd929cc |
| NULL                             | NULL                             | NULL         | 11a58793327e4f480717491484f4372a |
| NULL                             | NULL                             | NULL         | 31d436bafbad927dc79b130826dc3404 |
+----------------------------------+----------------------------------+--------------+----------------------------------+
20 rows in set (0.00 sec)
```

6. Subquery

SELECT * FROM orders WHERE customer_id = (SELECT customer_id FROM orders GROUP BY customer_id ORDER BY COUNT(order_id) DESC LIMIT 1);

```
mysql> SELECT * FROM orders WHERE customer_id = ( SELECT customer_id FROM orders GROUP BY customer_id ORDER BY COUNT(order_id) DESC  LIMIT 1);
+----------------------------------+----------------------------------+--------------+---------------------+---------------------+-----------------------+---------------------------+-----------
| order_id                         | customer_id                      | order_status | order_purchase_timestamp | order_approved_at | order_delivered_carrier_date | order_delivered_customer_date | order_estima
ted_delivery_date | customer_state |
+----------------------------------+----------------------------------+--------------+---------------------+---------------------+-----------------------+---------------------------+-----------
| 9b961b894e797f63622137ff7eb1c1af | 000598caf2ef4117407665ac33275130 | delivered    | 2018-08-11 12:14:00 | 2018-08-11 12:25:00 | 2018-08-13 14:41:00   | 2018-08-20 18:18:00       | 2018-09-06 0
      |  | MG |
+----------------------------------+----------------------------------+--------------+---------------------+---------------------+-----------------------+---------------------------+-----------
1 row in set (0.00 sec)
```

7. Order by and Group by

SELECT order_status, COUNT(*) AS total_orders FROM orders GROUP BY order_status ORDER BY total_orders DESC;

```
mysql> SELECT order_status, COUNT(*) AS total_orders FROM orders  GROUP BY order_status ORDER BY total_orders DESC;
+--------------+--------------+
| order_status | total_orders |
+--------------+--------------+
| delivered    |          944 |
| shipped      |           10 |
| canceled     |            5 |
| unavailable  |            5 |
| processing   |            4 |
| invoiced     |            3 |
+--------------+--------------+
6 rows in set (0.01 sec)
```

8. Views

CREATE VIEW orders_summary AS SELECT order_status, COUNT(order_id) AS total_orders, AVG(DATEDIFF(order_delivered_customer_date, order_purchase_timestamp)) AS avg_delivery_days, MIN(order_purchase_timestamp) AS first_order_date, MAX(order_purchase_timestamp) AS last_order_date FROM orders WHERE order_delivered_customer_date IS NOT NULL GROUP BY order_status ORDER BY total_orders DESC;

SELECT * FROM orders_summary;

```
mysql> CREATE VIEW orders_summary AS SELECT order_status, COUNT(order_id) AS total_orders, AVG(DATEDIFF(order_delivered_customer_date, order_purchase_timestamp)) AS avg_delivery_days, MIN(order_purchase_timestam
p) AS first_order_date, MAX(order_purchase_timestamp) AS last_order_date FROM orders WHERE order_delivered_customer_date IS NOT NULL GROUP BY order_status ORDER BY total_orders DESC;
Query OK, 0 rows affected (0.02 sec)

mysql> SELECT * FROM orders_summary;
+--------------+--------------+------------------+---------------------+---------------------+
| order_status | total_orders | avg_delivery_days | first_order_date    | last_order_date     |
+--------------+--------------+------------------+---------------------+---------------------+
| delivered    |          944 |          12.4364 | 2016-10-06 10:12:00 | 2018-08-25 18:37:00 |
| shipped      |            9 |         157.7778 | 2016-10-07 15:53:00 | 2018-04-13 16:27:00 |
| canceled     |            5 |         148.0000 | 2017-03-05 19:39:00 | 2018-07-30 12:04:00 |
| unavailable  |            5 |         227.2000 | 2017-05-29 19:22:00 | 2017-11-28 12:03:00 |
| processing   |            4 |         272.0000 | 2017-05-07 22:55:00 | 2018-01-11 11:45:00 |
| invoiced     |            3 |         490.3333 | 2017-02-09 15:27:00 | 2017-11-13 16:27:00 |
+--------------+--------------+------------------+---------------------+---------------------+
6 rows in set (0.01 sec)
```

9. Index

CREATE INDEX idx_orders_status ON orders(order_status);
SELECT * FROM orders WHERE order_status = 'delivered';

```
mysql> CREATE INDEX idx_orders_status ON orders(order_status);
Query OK, 0 rows affected, 1 warning (0.12 sec)
Records: 0  Duplicates: 0  Warnings: 1

mysql> SELECT * FROM orders WHERE order_status = 'delivered';
+----------------------------------+----------------------------------+--------------+---------------------+---------------------+-----------------------------+------------------------------+----------
| order_id                         | customer_id                      | order_status | order_purchase_timestamp | order_approved_at   | order_delivered_carrier_date | order_delivered_customer_date | order_estima
ted_delivery_date | customer_state |
+----------------------------------+----------------------------------+--------------+---------------------+---------------------+-----------------------------+------------------------------+----------
| 008c3a655c66f4d92370d0d422732f69 | f9f9943ef9d29a86f10de3b43cd84356 | delivered    | 2018-03-04 23:15:00 | 2018-03-06 04:08:00 | 2018-03-07 00:32:00          | 2018-03-09 20:27:00           | 2018-03-15 0
|            SP |
| 00c405bd7118715454a7846862f585a9d4 | 1ab52508d3c58d96241850142347b75f | delivered   | 2017-10-23 14:59:00 | 2017-10-23 15:14:00 | 2017-10-25 13:30:00          | 2017-10-31 18:47:00           | 2017-11-17 0
|            BA |
| 00d88c00221ce96a1cfcaca9f2fceb3b | 2726ee187e4908c9683ac2a8a0424af1 | delivered    | 2018-03-06 23:02:00 | 2018-03-06 23:15:00 | 2018-03-08 20:50:00          | 2018-03-28 15:49:00           | 2018-03-28 0
|            RJ |
| 00f2a3509bd600bd1a06a48353788d93 | 37dafcdee86df7843f93d4b4d5325dde | delivered    | 2018-02-25 12:08:00 | 2018-02-25 12:29:00 | 2018-02-28 15:34:00          | 2018-03-01 16:58:00           | 2018-03-26 0
|            SP |
| 01074135a88ffa5978eaadfc7f482f2b | acc1272df0c1c3d973ccb5be09d0ab41 | delivered    | 2018-03-30 10:53:00 | 2018-03-30 11:47:00 | 2018-04-02 23:06:00          | 2018-04-17 17:29:00           | 2018-04-24 0
|            MG |
| 0121cfa7c946e6589f50d7012d3eb5eb | 4797fb67b3991c9513486658f6d694fd | delivered    | 2017-08-30 11:47:00 | 2017-08-30 12:50:00 | 2017-08-31 21:36:00          | 2017-09-06 20:06:00           | 2017-09-26 0
|            SP |
| 01633cfec0376ac9f2606e271ede5574 | 7511d7ebaabaa2f1e5b75763fac193c9 | delivered    | 2017-02-23 12:10:00 | 2017-02-24 02:45:00 | 2017-03-01 16:14:00          | 2017-03-16 10:24:00           | 2017-04-05 0
|            BA |
| 02b73712c7944322d0b5a314f2424ee4 | d9778e3e408e8c54bdb818ab6bdccc39 | delivered    | 2017-09-16 10:25:00 | 2017-09-16 11:03:00 | 2017-09-18 18:03:00          | 2017-09-26 21:42:00           | 2017-10-06 0
|            RJ |
| 02bee300cb834a5d334ae42fdc325e7a | 9172f54a6e979ee28aaaada718189c9b | delivered    | 2018-06-19 17:51:00 | 2018-06-19 18:22:00 | 2018-06-20 14:07:00          | 2018-06-21 19:11:00           | 2018-06-29 0
|            SP |
| 02c6f38cbd2d15df19cf2621019823fd | 2cd1a450888a4cc3d4b8c5ed6482fe47 | delivered    | 2017-07-06 09:08:00 | 2017-07-07 02:55:00 | 2017-07-11 20:32:00          | 2017-07-18 18:42:00           | 2017-08-01 0
|            RS |
| 02c8da4642d8bb546d022a0701ea1b5a | 6aa648d1941ad74851f11529a29d5fdf | delivered    | 2018-07-24 14:06:00 | 2018-07-24 14:24:00 | 2018-07-25 14:38:00          | 2018-07-27 16:35:00           | 2018-08-06 0
|            SP |
| 02f886b28af7079755677a544bc54fda | b6354a784b22dad8e36b59fb230baedb | delivered    | 2017-11-08 00:38:00 | 2017-11-09 05:31:00 | 2017-11-10 20:18:00          | 2017-11-21 15:28:00           | 2017-11-22 0
|            SP |
| 02fab07a655ce404330d65b508f32d9e | 10eee4da147ae9bc5f7b21f32c1fb3c0 | delivered    | 2017-05-19 14:41:00 | 2017-05-19 14:55:00 | 2017-06-02 16:21:00          | 2017-06-08 16:55:00           | 2017-06-14 0
|            GO |
| 032f490884e03049a3ec0379ea0abb82 | 09f1f35ba98e019dc3e29823af2954fd | delivered    | 2017-06-08 16:45:00 | 2017-06-10 02:50:00 | 2017-06-13 08:18:00          | 2017-06-22 17:06:00           | 2017-07-10 0
|            SC |
| 0394e320572c0048e41267320a28270e | 28135fbf5e6fc1254fd50aafee7b02b0 | delivered    | 2017-05-03 11:58:00 | 2017-05-04 06:35:00 | 2017-05-04 15:58:00          | 2017-05-24 20:51:00           | 2017-06-07 0
|            AP |
| 039fcd445ffe2e560443c34326f2b764 | 7f3c887db8ec3506117be4612105cf28 | delivered    | 2018-06-03 12:06:00 | 2018-06-03 12:30:00 | 2018-06-04 09:11:00          | 2018-06-12 14:29:00           | 2018-07-13 0
|            SE |
| 03a18d20c8d8ed81a44b9dff494ff86c | 03432b33c8aeb8601e3ffbb38127ee2d | delivered    | 2017-08-17 20:28:00 | 2017-08-17 21:05:00 | 2017-08-30 15:08:00          | 2017-09-05 22:09:00           | 2017-09-15 0
|            GO |
| 04127548fb3634e50ad03765c05cdc68 | 0eab5c860fac0aff7a9ef8f11deced68 | delivered    | 2018-02-04 22:20:00 | 2018-02-04 22:30:00 | 2018-02-05 18:41:00          | 2018-02-06 15:45:00           | 2018-02-22 0
|            SP |
| 0417c9ab9d789459e660e8d325ce4a6a | d5f406fffe58d33efe48566eba1b6537 | delivered    | 2018-06-25 08:27:00 | 2018-06-25 08:38:00 | 2018-06-25 11:04:00          | 2018-06-27 15:52:00           | 2018-07-12 0
|            SP |
```