```
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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> CREATE DATABASE MONIKA_8018531
    -> CREATE DATABASE MONIKA_8018531;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds t
 for the right syntax to use near 'CREATE DATABASE MONIKA_8018531' at line 2
mysql> CREATE DATABASE MONIKA_8018531;
Query OK, 1 row affected (0.12 sec)

mysql> SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| monika_8018531     |
| mysql              |
| performance_schema |
| sys                |
| world              |
+--------------------+
6 rows in set (0.06 sec)

mysql> USE MONIKA_8018531;
Database changed
mysql>
```

```
Query OK, 0 rows affected (0.26 sec)

mysql> CREATE TABLE flights(
    -> id INT NOT NULL AUTO_INCREMENT,
    -> origin VARCHAR(15) NOT NULL,
    -> destination VARCHAR(15) NOT NULL,
    -> duration INT NOT NULL,
    -> PRIMARY KEY(id)
    -> );
Query OK, 0 rows affected (0.46 sec)

mysql> CREATE TABLE flights_noIndex(
    -> id INT NOT NULL,
    -> origin TEXT NOT NULL,
    -> destination TEXT NOT NULL,
    -> duration INTEGER NOT NULL
    -> );
Query OK, 0 rows affected (1.10 sec)

mysql> INSERT INTO flights
    -> (origin,destination,duration)
    -> VALUES ("New York","London",415);
Query OK, 1 row affected (0.13 sec)

mysql> INSERT INTO flights
    -> (origin,destination,duration)
    -> VALUES ("Shanghai","paris",760);
Query OK, 1 row affected (0.21 sec)

mysql> INSERT INTO flights
```

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MySQL 8.0 Command Line Client

    -> (origin,destination,duration)
    -> VALUES ("Shanghai","paris",760);
Query OK, 1 row affected (0.21 sec)

mysql> INSERT INTO flights
    -> (origin,destination,duration)
    -> VALUES ("Istanbul","Tokyo",700);
Query OK, 1 row affected (0.21 sec)

mysql> INSERT INTO flights
    -> (origin,destination,duration)
    -> VALUES ("Istanbul","Paris",435);
Query OK, 1 row affected (0.12 sec)

mysql> INSERT INTO flights
    -> (origin,destination,duration)
    -> VALUES ("New York","Paris",435);
Query OK, 1 row affected (0.10 sec)

mysql> INSERT INTO flights
    -> (origin,destination,duration)
    -> VALUES ("Moscow","Paris",245);
Query OK, 1 row affected (0.17 sec)

mysql> INSERT INTO flights
    -> (origin,destination,duration)
    -> VALUES ("Lima","New York",455);
Query OK, 1 row affected (0.10 sec)

mysql>
```

MySQL 8.0 Command Line Client

```
mysql> SELECT * FROM flights WHERE id=3;
+----+----------+-------------+----------+
| id | origin   | destination | duration |
+----+----------+-------------+----------+
|  3 | Istanbul | Tokyo       |      700 |
+----+----------+-------------+----------+
1 row in set (0.00 sec)

mysql> SELECT * FROM flights WHERE origin="New York";
+----+----------+-------------+----------+
| id | origin   | destination | duration |
+----+----------+-------------+----------+
|  1 | New York | London      |      415 |
|  5 | New York | Paris       |      435 |
+----+----------+-------------+----------+
2 rows in set (0.00 sec)

mysql> SELECT * FROM flights WHERE duration>500;
+----+----------+-------------+----------+
| id | origin   | destination | duration |
+----+----------+-------------+----------+
|  2 | Shanghai | paris       |      760 |
|  3 | Istanbul | Tokyo       |      700 |
+----+----------+-------------+----------+
2 rows in set (0.00 sec)

mysql> SELECT * FROM flights WHERE duration>500 AND destination="paris";
+----+----------+-------------+----------+
| id | origin   | destination | duration |
+----+----------+-------------+----------+
|  2 | Shanghai | paris       |      760 |
+----+----------+-------------+----------+
1 row in set (0.00 sec)
```

MySQL 8.0 Command Line Client

```
mysql> SELECT * FROM flights WHERE duration>500 OR destination="paris";
+----+----------+-------------+----------+
| id | origin   | destination | duration |
+----+----------+-------------+----------+
|  2 | Shanghai | paris       |      760 |
|  3 | Istanbul | Tokyo       |      700 |
|  4 | Istanbul | Paris       |      435 |
|  5 | New York | Paris       |      435 |
|  6 | Moscow   | Paris       |      245 |
+----+----------+-------------+----------+
5 rows in set (0.00 sec)

mysql> SELECT * FROM flights WHERE origin IN ("New York","Lima");
+----+----------+-------------+----------+
| id | origin   | destination | duration |
+----+----------+-------------+----------+
|  1 | New York | London      |      415 |
|  5 | New York | Paris       |      435 |
|  7 | Lima     | New York    |      455 |
+----+----------+-------------+----------+
3 rows in set (0.05 sec)

mysql> SELECT * FROM flights WHERE origin like"%a%";
+----+----------+-------------+----------+
| id | origin   | destination | duration |
+----+----------+-------------+----------+
|  2 | Shanghai | paris       |      760 |
|  3 | Istanbul | Tokyo       |      700 |
|  4 | Istanbul | Paris       |      435 |
|  7 | Lima     | New York    |      455 |
+----+----------+-------------+----------+
4 rows in set (0.06 sec)

mysql>
```

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MySQL 8.0 Command Line Client

4 rows in set (0.06 sec)

mysql> SELECT DISTINCT origin,destination FROM flights WHERE origin IN("New York", "Lima");
+----------+-------------+
| origin   | destination |
+----------+-------------+
| New York | London      |
| New York | Paris       |
| Lima     | New York    |
+----------+-------------+
3 rows in set (0.05 sec)

mysql> SELECT DISTINCT origin FROM flights WHERE origin IN("New York", "Lima");
+----------+
| origin   |
+----------+
| New York |
| Lima     |
+----------+
2 rows in set (0.00 sec)

mysql> SELECT * FROM flights LIMIT 5;
+----+----------+-------------+----------+
| id | origin   | destination | duration |
+----+----------+-------------+----------+
|  1 | New York | London      |      415 |
|  2 | Shanghai | paris       |      760 |
|  3 | Istanbul | Tokyo       |      700 |
|  4 | Istanbul | Paris       |      435 |
|  5 | New York | Paris       |      435 |
+----+----------+-------------+----------+
5 rows in set (0.00 sec)

mysql>
```

```
MySQL 8.0 Command Line Client

mysql> SELECT * FROM flights order by duration;
+----+----------+-------------+----------+
| id | origin   | destination | duration |
+----+----------+-------------+----------+
|  6 | Moscow   | Paris       |      245 |
|  1 | New York | London      |      415 |
|  4 | Istanbul | Paris       |      435 |
|  5 | New York | Paris       |      435 |
|  7 | Lima     | New York    |      455 |
|  3 | Istanbul | Tokyo       |      700 |
|  2 | Shanghai | paris       |      760 |
+----+----------+-------------+----------+
7 rows in set (0.00 sec)

mysql> SELECT ORIGIN,COUNT(DURATION) FROM FLIGHTS GROUP BY ORIGIN;
+----------+-----------------+
| ORIGIN   | COUNT(DURATION) |
+----------+-----------------+
| New York |               2 |
| Shanghai |               1 |
| Istanbul |               2 |
| Moscow   |               1 |
| Lima     |               1 |
+----------+-----------------+
5 rows in set (0.00 sec)

mysql> SELECT ORIGIN,COUNT(DURATION) FROM FLIGHTS GROUP BY ORIGIN having count(duration)>2;
Empty set (0.28 sec)

mysql> SELECT ORIGIN,COUNT(DURATION) FROM FLIGHTS GROUP BY ORIGIN having count(duration)=2;
+----------+-----------------+
| ORIGIN   | COUNT(DURATION) |
+----------+-----------------+
| New York |               2 |
```

```
| New York |                2 |
| Shanghai |                1 |
| Istanbul |                2 |
| Moscow   |                1 |
| Lima     |                1 |
+----------+------------------+
5 rows in set (0.00 sec)

mysql> SELECT ORIGIN,COUNT(DURATION) FROM FLIGHTS GROUP BY ORIGIN having count(duration)>2;
Empty set (0.28 sec)

mysql> SELECT ORIGIN,COUNT(DURATION) FROM FLIGHTS GROUP BY ORIGIN having count(duration)=2;
+----------+------------------+
| ORIGIN   | COUNT(DURATION)  |
+----------+------------------+
| New York |                2 |
| Istanbul |                2 |
+----------+------------------+
2 rows in set (0.00 sec)

mysql> SELECT ORIGIN,COUNT(DURATION) FROM FLIGHTS GROUP BY ORIGIN having count(duration)<2;
+----------+------------------+
| ORIGIN   | COUNT(DURATION)  |
+----------+------------------+
| Shanghai |                1 |
| Moscow   |                1 |
| Lima     |                1 |
+----------+------------------+
3 rows in set (0.00 sec)
```

MySQL 8.0 Command Line Client

```
mysql>
mysql> UPDATE flights
    -> SET duration = 430
    -> WHERE origin="New York"
    -> AND destination="London";
Query OK, 1 row affected (0.10 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from flights;
+----+----------+-------------+----------+
| id | origin   | destination | duration |
+----+----------+-------------+----------+
|  1 | New York | London      |      430 |
|  2 | Shanghai | paris       |      760 |
|  3 | Istanbul | Tokyo       |      700 |
|  4 | Istanbul | Paris       |      435 |
|  5 | New York | Paris       |      435 |
|  6 | Moscow   | Paris       |      245 |
|  7 | Lima     | New York    |      455 |
+----+----------+-------------+----------+
7 rows in set (0.06 sec)

mysql> DELETE FROM flights WHERE destination="Tokyo";
Query OK, 1 row affected (0.13 sec)

mysql> select * from flights;
+----+----------+-------------+----------+
| id | origin   | destination | duration |
+----+----------+-------------+----------+
|  1 | New York | London      |      430 |
|  2 | Shanghai | paris       |      760 |
|  4 | Istanbul | Paris       |      435 |
|  5 | New York | Paris       |      435 |
|  6 | Moscow   | Paris       |      245 |
|  7 | Lima     | New York    |      455 |
+----+----------+-------------+----------+
6 rows in set (0.00 sec)

mysql> select AVG(duration) from flights;
+---------------+
| AVG(duration) |
+---------------+
|      460.0000 |
```

MySQL 8.0 Command Line Client

```
mysql> select COUNT(duration) from flights;
+-----------------+
| COUNT(duration) |
+-----------------+
|               6 |
+-----------------+
1 row in set (0.10 sec)

mysql> select COUNT(duration) from flights where orgin="New York";
ERROR 1054 (42S22): Unknown column 'orgin' in 'where clause'
mysql> select COUNT(duration) from flights where origin="New York";
+-----------------+
| COUNT(duration) |
+-----------------+
|               2 |
+-----------------+
1 row in set (0.00 sec)

mysql> select sum(duration) from flights;
+---------------+
| sum(duration) |
+---------------+
|          2760 |
+---------------+
1 row in set (0.00 sec)

mysql> select min(duration) from flights;
+---------------+
| min(duration) |
+---------------+
|           245 |
+---------------+
1 row in set (0.05 sec)

mysql> select max(duration) from flights;
+---------------+
| max(duration) |
+---------------+
|           760 |
+---------------+
1 row in set (0.00 sec)

mysql>
```

```
mysql> select max(duration) from flights;
+---------------+
| max(duration) |
+---------------+
|           760 |
+---------------+
1 row in set (0.00 sec)

mysql> START TRANSACTION;
Query OK, 0 rows affected (0.00 sec)

mysql> INSERT INTO fights
    -> (origin,destination,duration)
    -> VALUES ("Chennai","Bangalore",123);
ERROR 1146 (42S02): Table 'monika_8018531.fights' doesn't exist
mysql> INSERT INTO flights
    -> (origin,destination,duration)
    -> VALUES ("Chennai","Bangalore",123);
Query OK, 1 row affected (0.06 sec)

mysql> COMMIT;
Query OK, 0 rows affected (0.11 sec)

mysql> SET AUTOCOMMIT=0;
Query OK, 0 rows affected (0.00 sec)

mysql> select * from flights;
+----+----------+-------------+----------+
| id | origin   | destination | duration |
+----+----------+-------------+----------+
|  1 | New York | London      |      430 |
|  2 | Shanghai | paris       |      760 |
|  4 | Istanbul | Paris       |      435 |
|  5 | New York | Paris       |      435 |
|  6 | Moscow   | Paris       |      245 |
|  7 | Lima     | New York    |      455 |
|  8 | Chennai  | Bangalore   |      123 |
+----+----------+-------------+----------+
7 rows in set (0.06 sec)

mysql> INSERT INTO flights
    -> (origin,destination,duration)
    -> VALUES ("Chennai","Goa",533);
```

MySQL 8.0 Command Line Client

```
mysql> INSERT INTO flights
    -> (origin,destination,duration)
    -> VALUES ("Chennai","Goa",533);
Query OK, 1 row affected (0.05 sec)

mysql> INSERT INTO flights
    -> (origin,destination,duration)
    -> VALUES ("Madurai","Goa",933);
Query OK, 1 row affected (0.00 sec)

mysql> select * from flights
    -> ;
+----+----------+-------------+----------+
| id | origin   | destination | duration |
+----+----------+-------------+----------+
|  1 | New York | London      |      430 |
|  2 | Shanghai | paris       |      760 |
|  4 | Istanbul | Paris       |      435 |
|  5 | New York | Paris       |      435 |
|  6 | Moscow   | Paris       |      245 |
|  7 | Lima     | New York    |      455 |
|  8 | Chennai  | Bangalore   |      123 |
|  9 | Chennai  | Goa         |      533 |
| 10 | Madurai  | Goa         |      933 |
+----+----------+-------------+----------+
9 rows in set (0.00 sec)

mysql> Delete from flights WHERE origin="New York";
Query OK, 2 rows affected (0.06 sec)

mysql> select * from flights;
+----+----------+-------------+----------+
| id | origin   | destination | duration |
+----+----------+-------------+----------+
|  2 | Shanghai | paris       |      760 |
|  4 | Istanbul | Paris       |      435 |
|  6 | Moscow   | Paris       |      245 |
|  7 | Lima     | New York    |      455 |
|  8 | Chennai  | Bangalore   |      123 |
|  9 | Chennai  | Goa         |      533 |
| 10 | Madurai  | Goa         |      933 |
+----+----------+-------------+----------+
7 rows in set (0.00 sec)
```

```
mysql> Rollback;
Query OK, 0 rows affected (0.12 sec)

mysql> select * from flights;
+----+----------+-------------+----------+
| id | origin   | destination | duration |
+----+----------+-------------+----------+
|  1 | New York | London      |      430 |
|  2 | Shanghai | paris       |      760 |
|  4 | Istanbul | Paris       |      435 |
|  5 | New York | Paris       |      435 |
|  6 | Moscow   | Paris       |      245 |
|  7 | Lima     | New York    |      455 |
|  8 | Chennai  | Bangalore   |      123 |
+----+----------+-------------+----------+
7 rows in set (0.06 sec)

mysql> CREATE TABLE airports(
    -> id INT NOT NULL AUTO_INCREMENT,
    -> code VARCHAR(3) NOT NULL,
    -> city VARCHAR(15) NOT NULL,
    -> PRIMARY KEY(id)
    -> );
Query OK, 0 rows affected (1.41 sec)

mysql> INSERT INTO airports (code,city)VALUES("JFK","New York");
Query OK, 1 row affected (0.09 sec)

mysql> INSERT INTO airports (code,city)VALUES("PVG","Shanghai");
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO airports (code,city)VALUES("IST","Istanbul");
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO airports (code,city)VALUES("LHR","London");
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO airports (code,city)VALUES("SVO","Moscow");
Query OK, 1 row affected (0.07 sec)

mysql> INSERT INTO airports (code,city)VALUES("LIM","Lima");
Query OK, 1 row affected (0.00 sec)
```

MySQL 8.0 Command Line Client

```
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO airports (code,city)VALUES("LHR","London");
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO airports (code,city)VALUES("SVO","Moscow");
Query OK, 1 row affected (0.07 sec)

mysql> INSERT INTO airports (code,city)VALUES("LIM","Lima");
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO airports (code,city)VALUES("CDG","Paris");
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO airports (code,city)VALUES("NRT","Tokyo");
Query OK, 1 row affected (0.00 sec)

mysql> select * from airports;
+----+------+----------+
| id | code | city     |
+----+------+----------+
|  1 | JFK  | New York |
|  2 | PVG  | Shanghai |
|  3 | IST  | Istanbul |
|  4 | LHR  | London   |
|  5 | SVO  | Moscow   |
|  6 | LIM  | Lima     |
|  7 | CDG  | Paris    |
|  8 | NRT  | Tokyo    |
+----+------+----------+
8 rows in set (0.00 sec)
```

```
MySQL 8.0 Command Line Client

ERROR 1051 (42S02): Unknown table 'monika_8018531.passenger'
mysql> CREATE TABLE passenger (
    -> id INT NOT NULL,
    -> fname VARCHAR(15) NOT NULL,
    -> lname VARCHAR(15) NOT NULL,
    -> flight_id INT,
    -> INDEX par_ind (flight_id),
    -> CONSTRAINT fk_flights FOREIGN KEY(flight_id)
    -> REFERENCES flights(id)
    -> ON DELETE SET NULL
    -> ON UPDATE SET NULL
    -> );
Query OK, 0 rows affected (1.84 sec)

mysql> INSERT INTO Passenger(id,fname,lname,flight_id) VALUES(1,"Harry","Potter",1);
Query OK, 1 row affected (0.07 sec)

mysql> INSERT INTO Passenger(id,fname,lname,flight_id) VALUES(2,"Ron","Weasley",1);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO Passenger(id,fname,lname,flight_id) VALUES(2,"Hermione","Granger",2);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO Passenger(id,fname,lname,flight_id) VALUES(2,"Draco","Malfoy"42);
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL se
1
mysql> INSERT INTO Passenger(id,fname,lname,flight_id) VALUES(2,"Draco","Malfoy",42);
ERROR 1452 (23000): Cannot add or update a child row: a foreign key constraint fails (`monika_8018531`.`pas:
FERENCES `flights` (`id`) ON DELETE SET NULL ON UPDATE SET NULL)
mysql> INSERT INTO Passenger(id,fname,lname,flight_id) VALUES(2,"Draco","Malfoy",4);
Query OK, 1 row affected (0.10 sec)

mysql> INSERT INTO Passenger(id,fname,lname,flight_id) VALUES(2,"Luna","Lovegood",6);
Query OK, 1 row affected (0.00 sec)

mysql> INSERT INTO Passenger(id,fname,lname,flight_id) VALUES(2,"Ginny","Weasley",6);
Query OK, 1 row affected (0.00 sec)

mysql> select * from passenger;
+----+----------+----------+-----------+
| id | fname    | lname    | flight_id |
+----+----------+----------+-----------+
|  1 | Harry    | Potter   |         1 |
|  2 | Ron      | Weasley  |         1 |
```

```
mysql> select * from passenger;
+----+----------+----------+-----------+
| id | fname    | lname    | flight_id |
+----+----------+----------+-----------+
|  1 | Harry    | Potter   |         1 |
|  2 | Ron      | Weasley  |         1 |
|  2 | Hermione | Granger  |         2 |
|  2 | Draco    | Malfoy   |         4 |
|  2 | Luna     | Lovegood |         6 |
|  2 | Ginny    | Weasley  |         6 |
+----+----------+----------+-----------+
6 rows in set (0.00 sec)

mysql> SELECT flight_id,fname,lname,origin,destination
    -> From flights JOIN passenger
    -> ON passenger.flight_id=flights.id;
+-----------+----------+----------+----------+-------------+
| flight_id | fname    | lname    | origin   | destination |
+-----------+----------+----------+----------+-------------+
|         1 | Harry    | Potter   | New York | London      |
|         1 | Ron      | Weasley  | New York | London      |
|         2 | Hermione | Granger  | Shanghai | paris       |
|         4 | Draco    | Malfoy   | Istanbul | Paris       |
|         6 | Luna     | Lovegood | Moscow   | Paris       |
|         6 | Ginny    | Weasley  | Moscow   | Paris       |
+-----------+----------+----------+----------+-------------+
6 rows in set (0.11 sec)

mysql> SELECT flight_id,fname,lname,origin,destination
    -> From flights OUTER JOIN passenger
    -> ON passenger.flight_id=flights.id;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MyS
ssenger
ON passenger.flight_id=flights.id' at line 2
mysql> SELECT flight_id,fname,lname,origin,destination
    -> From flights RIGHT OUTER JOIN passenger
    -> ON passenger.flight_id=flights.id;
+-----------+----------+----------+----------+-------------+
| flight_id | fname    | lname    | origin   | destination |
+-----------+----------+----------+----------+-------------+
|         1 | Harry    | Potter   | New York | London      |
|         1 | Ron      | Weasley  | New York | London      |
|         2 | Hermione | Granger  | Shanghai | paris       |
```

MySQL 8.0 Command Line Client

```
mysql> SELECT flight_id,fname,lname,origin,destination
    -> From flights RIGHT OUTER JOIN passenger
    -> ON passenger.flight_id=flights.id;
+-----------+----------+----------+----------+-------------+
| flight_id | fname    | lname    | origin   | destination |
+-----------+----------+----------+----------+-------------+
|         1 | Harry    | Potter   | New York | London      |
|         1 | Ron      | Weasley  | New York | London      |
|         2 | Hermione | Granger  | Shanghai | paris       |
|         4 | Draco    | Malfoy   | Istanbul | Paris       |
|         6 | Luna     | Lovegood | Moscow   | Paris       |
|         6 | Ginny    | Weasley  | Moscow   | Paris       |
+-----------+----------+----------+----------+-------------+
6 rows in set (0.08 sec)

mysql> SELECT flight_id,fname,lname,origin,destination
    -> From flights LEFT OUTER JOIN passenger
    -> ON passenger.flight_id=flights.id;
+-----------+----------+----------+----------+-------------+
| flight_id | fname    | lname    | origin   | destination |
+-----------+----------+----------+----------+-------------+
|         1 | Harry    | Potter   | New York | London      |
|         1 | Ron      | Weasley  | New York | London      |
|         2 | Hermione | Granger  | Shanghai | paris       |
|         4 | Draco    | Malfoy   | Istanbul | Paris       |
|      NULL | NULL     | NULL     | New York | Paris       |
|         6 | Luna     | Lovegood | Moscow   | Paris       |
|         6 | Ginny    | Weasley  | Moscow   | Paris       |
|      NULL | NULL     | NULL     | Lima     | New York    |
|      NULL | NULL     | NULL     | Chennai  | Bangalore   |
+-----------+----------+----------+----------+-------------+
9 rows in set (0.00 sec)

mysql>
```