All Airport Tables

```
mysql> SHOW TABLES;
+------------------+
| Tables_in_airport |
+------------------+
| Captain          |
| Employeee        |
| Flight           |
| Flight_Attendant |
| Is_Present       |
| Passenger        |
| Plane            |
| Serves           |
| Staff_Member     |
| Takes_Off        |
| Works_With       |
| vcaptain         |
| vpassenger       |
| vstaffmem        |
+------------------+
14 rows in set (0.00 sec)
```

Tables for isA Relation

```
mysql> DESCRIBE Captain;
+--------------+----------+------+-----+---------+-------+
| Field        | Type     | Null | Key | Default | Extra |
+--------------+----------+------+-----+---------+-------+
| eid          | char(10) | NO   | PRI | NULL    |       |
| contact_info | double   | YES  |     | NULL    |       |
+--------------+----------+------+-----+---------+-------+
2 rows in set (0.00 sec)
```

```
mysql> DESCRIBE Employeee;
+------------+--------------+------+-----+---------+-------+
| Field      | Type         | Null | Key | Default | Extra |
+------------+--------------+------+-----+---------+-------+
| eid        | char(10)     | NO   | PRI | NULL    |       |
| name       | varchar(100) | YES  |     | NULL    |       |
| experience | varchar(100) | YES  |     | NULL    |       |
```

```
| salary     | int(11)      | YES  |     | NULL    |       |
+------------+--------------+------+-----+---------+-------+
4 rows in set (0.00 sec)


mysql> DESCRIBE Flight_Attendant;
+------------------+----------+------+-----+---------+-------+
| Field            | Type     | Null | Key | Default | Extra |
+------------------+----------+------+-----+---------+-------+
| eid              | char(10) | NO   | PRI | NULL    |       |
| contact_info     | double   | YES  |     | NULL    |       |
| flying_licenseid | double   | YES  |     | NULL    |       |
+------------------+----------+------+-----+---------+-------+
3 rows in set (0.00 sec)


mysql> DESCRIBE Staff_Member;
+--------------+----------+------+-----+---------+-------+
| Field        | Type     | Null | Key | Default | Extra |
+--------------+----------+------+-----+---------+-------+
| eid          | char(10) | NO   | PRI | NULL    |       |
| contact_info | double   | YES  |     | NULL    |       |
+--------------+----------+------+-----+---------+-------+
2 rows in set (0.00 sec)


mysql> DESCRIBE Captain;
+--------------+----------+------+-----+---------+-------+
| Field        | Type     | Null | Key | Default | Extra |
+--------------+----------+------+-----+---------+-------+
| eid          | char(10) | NO   | PRI | NULL    |       |
| contact_info | double   | YES  |     | NULL    |       |
+--------------+----------+------+-----+---------+-------+
2 rows in set (0.00 sec)


mysql> SELECT * FROM Employeee;
+-----+---------+-------------+--------+
| eid | name    | experience  | salary |
```

```
+-----+---------+-------------+--------+
| C1  | Leo     | one years   |   2000 |
| C2  | James   | two years   |   5500 |
| C3  | Dan     | two years   |   6000 |
| E1  | Joe     | five years  |  10000 |
| E2  | Bob     | three years |   6000 |
| E3  | Jon     | two years   |   5000 |
| F1  | Alex    | five years  |   9000 |
| F2  | Ava     | three years |   6000 |
| F3  | Mike    | two years   |   5000 |
| S1  | Louis   | two years   |   5000 |
| S2  | Jessica | three years |   6000 |
| S3  | Jack    | one years   |   2000 |
+-----+---------+-------------+--------+
12 rows in set (0.00 sec)



mysql> SELECT * FROM Flight_Attendant;
+-----+--------------+------------------+
| eid | contact_info | flying_licenseid |
+-----+--------------+------------------+
| F1  |   7322223333 |                1 |
| F2  |   7326726957 |                2 |
| F3  |   7324385726 |                3 |
+-----+--------------+------------------+
3 rows in set (0.00 sec)



mysql> SELECT * FROM Staff_Member;
+-----+--------------+
| eid | contact_info |
+-----+--------------+
| S1  |   7321231111 |
| S2  |   7323452222 |
| S3  |   7323213333 |
+-----+--------------+
3 rows in set (0.00 sec)

CREATE USER 'admin'@'localhost' IDENTIFIED BY 'mypass';
GRANT ALL PRIVILEGES ON *.* TO 'monty'@'localhost'
    WITH GRANT OPTION;
```

SQL for isA Relation

```
CREATE TABLE Employeee (
eid CHAR(10) NOT NULL,
name VARCHAR(100),
experience VARCHAR(100),
salary INT,
PRIMARY KEY (eid));
INSERT INTO Employeee VALUES ("E1", "Joe", "five years", 10000);
INSERT INTO Employeee VALUES ("E2", "Bob", "three years", 6000);
INSERT INTO Employeee VALUES ("E3", "Jon", "two years", 5000);
INSERT INTO Employeee VALUES ("C1", "Leo", "one years", 2000);
INSERT INTO Employeee VALUES ("C2", "James", "two years", 5500);
INSERT INTO Employeee VALUES ("C3", "Dan", "two years", 6000);
INSERT INTO Employeee VALUES ("F1", "Alex", "five years", 9000);
INSERT INTO Employeee VALUES ("F2", "Ava", "three years", 6000);
INSERT INTO Employeee VALUES ("F3", "Mike", "two years", 5000);
INSERT INTO Employeee VALUES ("S1", "Louis", "two years", 5000);
INSERT INTO Employeee VALUES ("S2", "Jessica", "three years", 6000);
INSERT INTO Employeee VALUES ("S3", "Jack", "one years", 2000);

CREATE TABLE Captain (
eid integer NOT NULL,
contact_info real,
PRIMARY KEY (eid),
FOREIGN KEY (eid) REFERENCES Employee (eid) ON DELETE CASCADE);
INSERT INTO Captain VALUES (5, 7321112222);
INSERT INTO Captain VALUES (6, 7323334444);
INSERT INTO Captain VALUES (7, 7324445555);

CREATE TABLE Flight_Attendant (
eid integer NOT NULL,
contact_info real,
flying_licenseid real,
PRIMARY KEY (eid),
FOREIGN KEY (eid) REFERENCES Employee (eid) ON DELETE CASCADE);
INSERT INTO Flight_Attendant VALUES (1, 7322223333, 1);
INSERT INTO Flight_Attendant VALUES (2, 7326726957, 2);
INSERT INTO Flight_Attendant VALUES (3, 7324385726, 3);
```

```
CREATE TABLE Staff_Member (
eid CHAR(10) NOT NULL,
contact_info real,
PRIMARY KEY (eid),
FOREIGN KEY (eid) REFERENCES Employeee (eid));
INSERT INTO Staff_Member VALUES ("S1", 7321231111);
INSERT INTO Staff_Member VALUES ("S2", 7323452222);
INSERT INTO Staff_Member VALUES ("S3", 7323213333);
```

TABLES for Exactly: Each passenger is present on exactly 1 flight.

```
mysql> DESCRIBE Plane;
+------------+----------+------+-----+---------+-------+
| Field      | Type     | Null | Key | Default | Extra |
+------------+----------+------+-----+---------+-------+
| pid        | int(11)  | NO   | PRI | NULL    |       |
| year_made  | date     | YES  |     | NULL    |       |
| model_name | char(10) | YES  |     | NULL    |       |
| capacity   | int(11)  | YES  |     | NULL    |       |
+------------+----------+------+-----+---------+-------+
4 rows in set (0.01 sec)



mysql> SELECT * FROM Plane;
+-----+------------+------------+----------+
| pid | year_made  | model_name | capacity |
+-----+------------+------------+----------+
|   1 | 1990-12-31 | boeing     |      900 |
|   2 | 1995-12-31 | continenta |      500 |
|   3 | 1991-12-31 | air india  |      700 |
+-----+------------+------------+----------+
3 rows in set (0.00 sec)



mysql> DESCRIBE Passenger;
+-------------+-----------+------+-----+---------+-------+
| Field       | Type      | Null | Key | Default | Extra |
+-------------+-----------+------+-----+---------+-------+
| paid        | int(11)   | NO   | PRI | NULL    |       |
| name        | char(100) | YES  |     | NULL    |       |
```

```
| contact_info | char(20)  | YES  |     | NULL    |       |
| notVIP       | char(100) | YES  |     | NULL    |       |
+--------------+-----------+------+-----+---------+-------+
5 rows in set (0.00 sec)


mysql> SELECT * FROM Passenger;
+------+--------+-------------+--------+-----------+
| paid | name   | contact_info | notVIP |
+------+--------+-------------+--------+-----------+
|    1 | Parth  | 8481236666   | no     |
|    2 | Josie  | 8486676376   | no     |
|    3 | Harsha | 7328236699   | yes    |
+------+--------+-------------+--------+-----------+
3 rows in set (0.00 sec)
```

SQL for Exactly

```
CREATE TABLE Plane (
pid integer NOT NULL,
year_made DATE,
model_name CHAR(10),
capacity INTEGER,
PRIMARY KEY (pid));
INSERT INTO Plane VALUES (1, '1990-12-31', "boeing", 900);
INSERT INTO Plane VALUES (2, '1995-12-31', "continental", 500);
INSERT INTO Plane VALUES (3, '1991-12-31', "air india", 700);


CREATE TABLE Passenger (
paid integer NOT NULL,
name CHAR(100),
contact_info CHAR(20),
notVIP CHAR(100),
Flight_no CHAR(5),
PRIMARY KEY (paid));
FOREIGN KEY (Flight_no) REFERENCES Flight (Flight_no) ON DELETE CASCADE);
INSERT INTO Passenger VALUES (1, "Parth", "8481236666", "no", "10");
INSERT INTO Passenger VALUES (2, "Josie", "8486676376", "no", "7");
INSERT INTO Passenger VALUES (3, "Harsha", "7328236699", "yes", "5");
```

```
mysql> DESCRIBE past_experience;
+-----------+----------+------+-----+---------+-------+
| Field     | Type     | Null | Key | Default | Extra |
+-----------+----------+------+-----+---------+-------+
| flight_dates      | DATE  | YES  |     | NULL    |       |
| airline  | char(10)  | NO  |     | NULL    |       |
| plane_model | char(5)  | NO   | PRI |         |       |
+-----------+----------+------+-----+---------+-------+
3 rows in set (0.00 sec)


mysql> SELECT * FROM Flight;
+------+----------+-----------+----------+-----------+-----------+---------+---------+-----+
| seat | terminal | Flight_no | schedule | d_airport | a_airport | nonStop | status  | pid |
+------+----------+-----------+----------+-----------+-----------+---------+---------+-----+
| 2B   | 2        |      1234 |     2100 | FlAir     | lax       | n       | on time |   1 |
| 3C   | 3        |      2349 |     1200 | LaGuardia | lax       | n       | on time |   3 |
| 1A   | 1        |      5678 |      900 | lax       | LaGuardia | n       | on time |   2 |
+------+----------+-----------+----------+-----------+-----------+---------+---------+-----+
3 rows in set (0.00 sec)


CREATE TABLE past_experience(
flight_dates DATE,
airline CHAR(10),
plane_model CHAR(5),
PRIMARY KEY (flight_dates),
FOREIGN KEY (eid) REFERENCES Captain (eid));

CREATE TABLE Flight (
seat CHAR(2),
terminal CHAR(2),
Flight_no INTEGER,
schedule INTEGER,
d_airport CHAR(10),
a_airport CHAR(10),
nonStop CHAR(1),
```

```
status Char (10),
pid integer NOT NULL,
PRIMARY KEY (Flight_no));
FOREIGN KEY (pid) REFERENCES Plane (pid) ON DELETE CASCADE);
INSERT INTO Flight VALUES ("1A", "1", 5678, 900, "lax", "LaGuardia", "n", "on time", 2);
INSERT INTO Flight VALUES ("2B", "2", 1234, 2100, "FlAir", "lax", "n", "on time", 1);
INSERT INTO Flight VALUES ("3C", "3", 2349, 1200, "LaGuardia", "lax", "n", "on time", 3);

CREATE TABLE Plane (
pid integer NOT NULL,
year_made DATE,
model_name CHAR(10),
capacity INTEGER,
PRIMARY KEY (pid));
```

Tables for Unary

```
mysql> DESCRIBE Flight_Attendant;
+-----------------+---------+------+-----+---------+-------+
| Field           | Type    | Null | Key | Default | Extra |
+-----------------+---------+------+-----+---------+-------+
| eid             | int(11) | NO   | PRI | NULL    |       |
| contact_info    | double  | YES  |     | NULL    |       |
| flying_licenseid | double  | YES  |     | NULL    |       |
+-----------------+---------+------+-----+---------+-------+
3 rows in set (0.01 sec)

mysql> SELECT * FROM Flight_Attendant;
+-----+--------------+-----------------+
| eid | contact_info | flying_licenseid |
+-----+--------------+-----------------+
| F1  |   7322223333 |               1 |
| F2  |   7326726957 |               2 |
| F3  |   7324385726 |               3 |
+-----+--------------+-----------------+
3 rows in set (0.00 sec)


mysql> DESCRIBE Works_With;
+----------+---------+------+-----+---------+-------+
| Field    | Type    | Null | Key | Default | Extra |
```

```
+----------+---------+------+-----+---------+-------+
| MExp_eid | int(11) | NO   | PRI | NULL    |       |
| LExp_eid | int(11) | NO   | PRI | NULL    |       |
+----------+---------+------+-----+---------+-------+
2 rows in set (0.00 sec)
```

SQL for Unary

```
CREATE TABLE Flight_Attendant (
eid integer NOT NULL,
contact_info real,
flying_licenseid real,
PRIMARY KEY (eid),
FOREIGN KEY (eid) REFERENCES Employee (eid) ON DELETE CASCADE);
INSERT INTO Flight_Attendant VALUES (1, 7322223333, 1);
INSERT INTO Flight_Attendant VALUES (2, 7326726957, 2);
INSERT INTO Flight_Attendant VALUES (3, 7324385726, 3);

CREATE TABLE Works_With (
MExp_eid integer NOT NULL,
LExp_eid integer NOT NULL,
PRIMARY KEY (MExp_eid, LExp_eid));
FOREIGN KEY (MExp_eid) REFERENCES Flight_Attendant (eid);
FOREIGN KEY (LExp_eid) REFERENCES Flight_Attendant (eid);
)
```

Tables for Ternary

```
mysql> DESCRIBE Takes_Off;
+-------+----------+------+-----+---------+-------+
| Field | Type     | Null | Key | Default | Extra |
+-------+----------+------+-----+---------+-------+
| cID   | char(10) | YES  |     | NULL    |       |
| pID   | char(5)  | NO   | PRI |         |       |
| eID   | char(10) | YES  |     | NULL    |       |
+-------+----------+------+-----+---------+-------+
3 rows in set (0.00 sec)

mysql> DESCRIBE Plane;
+------------+----------+------+-----+---------+-------+
| Field      | Type     | Null | Key | Default | Extra |
+------------+----------+------+-----+---------+-------+
| pid        | int(11)  | NO   | PRI | NULL    |       |
```

```
| year_made  | date     | YES  |     | NULL    |       |
| model_name | char(10) | YES  |     | NULL    |       |
| capacity   | int(11)  | YES  |     | NULL    |       |
+------------+----------+------+-----+---------+-------+
4 rows in set (0.00 sec)

mysql> DESCRIBE Captain;
+--------------+---------+------+-----+---------+-------+
| Field        | Type    | Null | Key | Default | Extra |
+--------------+---------+------+-----+---------+-------+
| eid          | int(11) | NO   | PRI | NULL    |       |
| contact_info | double  | YES  |     | NULL    |       |
+--------------+---------+------+-----+---------+-------+
2 rows in set (0.00 sec)

mysql> DESCRIBE Flight;
+-----------+----------+------+-----+---------+-------+
| Field     | Type     | Null | Key | Default | Extra |
+-----------+----------+------+-----+---------+-------+
| seat      | char(2)  | YES  |     | NULL    |       |
| terminal  | char(2)  | YES  |     | NULL    |       |
| Flight_no | int(11)  | NO   | PRI | 0       |       |
| schedule  | int(11)  | YES  |     | NULL    |       |
| d_airport | char(10) | YES  |     | NULL    |       |
| a_airport | char(10) | YES  |     | NULL    |       |
| nonStop   | char(1)  | YES  |     | NULL    |       |
| status    | char(10) | YES  |     | NULL    |       |
| pid       | int(11)  | NO   |     | NULL    |       |
+-----------+----------+------+-----+---------+-------+
9 rows in set (0.00 sec)
```

SQL for Ternary

```
CREATE TABLE Takes_Off (
cID CHAR(10),
pID CHAR(5),
fID CHAR(10),
Primary key (pID));
Foreign KEY (pID) REFERENCES Plane(pID) ON DELETE CASCADE;
Foreign KEY (cID) REFERENCES Captain(cID) ON DELETE CASCADE;
Foreign KEY (fID) REFERENCES Flight(fID) ON DELETE CASCADE;
)
```

```
CREATE TABLE Plane (
pid integer NOT NULL,
year_made DATE,
model_name CHAR(10),
capacity INTEGER,
PRIMARY KEY (pid));



CREATE TABLE Is_Present(
pid CHAR(10),
paid integer,
eid integer NOT NULL,
Flight_no INTEGER,
clD CHAR(10),
PRIMARY KEY (paid, pid));
FOREIGN KEY(paid) REFERENCES Passenger(paid);
FOREIGN KEY (pid) REFERENCES Plane(pid);
)
```

Tables for At Least

```
mysql> DESCRIBE Serves;
+-------+---------+------+-----+---------+-------+
| Field | Type    | Null | Key | Default | Extra |
+-------+---------+------+-----+---------+-------+
| paid  | int(11) | NO   | PRI | NULL    |       |
| eid   | int(11) | NO   | PRI | NULL    |       |
+-------+---------+------+-----+---------+-------+
2 rows in set (0.00 sec)

mysql> DESCRIBE Passenger;
+--------------+-----------+------+-----+---------+-------+
| Field        | Type      | Null | Key | Default | Extra |
+--------------+-----------+------+-----+---------+-------+
| paid         | int(11)   | NO   | PRI | NULL    |       |
| name         | char(100) | YES  |     | NULL    |       |
| contact_info | char(20)  | YES  |     | NULL    |       |
| notVIP       | char(100) | YES  |     | NULL    |       |
+--------------+-----------+------+-----+---------+-------+
5 rows in set (0.00 sec)
```

```
mysql> DESCRIBE Staff_Member;
+--------------+---------+------+-----+---------+-------+
| Field        | Type    | Null | Key | Default | Extra |
+--------------+---------+------+-----+---------+-------+
| eid          | int(11) | NO   | PRI | NULL    |       |
| contact_info | double  | YES  |     | NULL    |       |
+--------------+---------+------+-----+---------+-------+
2 rows in set (0.00 sec)
```

SQL for At Least: Each passenger is served by at least 1 staff member

```
CREATE TABLE Serves (
paid integer NOT NULL,
eid integer NOT NULL,
PRIMARY KEY (eid),
FOREIGN KEY (paid) REFERENCES Professor (paid) ON DELETE CASCADE,
FOREIGN KEY (eid) REFERENCES Course (eid)) ON DELETE CASCADE;

CREATE TABLE Passenger (
paid integer NOT NULL,
name CHAR(100),
contact_info CHAR(20),
notVIP CHAR(100),
Flight_no CHAR(5),
PRIMARY KEY (paid));
FOREIGN KEY (Flight_no) REFERENCES Flight (Flight_no) ON DELETE CASCADE);
INSERT INTO Passenger VALUES (1, "Parth", "8481236666", "no", "10");
INSERT INTO Passenger VALUES (2, "Josie", "8486676376", "no", "7");
INSERT INTO Passenger VALUES (3, "Harsha", "7328236699", "yes", "5");

CREATE TABLE Staff_Member (
eid integer NOT NULL,
contact_info real,
PRIMARY KEY (eid),
FOREIGN KEY (eid) REFERENCES Employee (eid));
```

Tables for At Most

```
mysql> DESCRIBE Serves;
```

```
+-------+---------+------+-----+---------+-------+
| Field | Type    | Null | Key | Default | Extra |
+-------+---------+------+-----+---------+-------+
| paid  | int(11) | NO   | MUL | NULL    |       |
| eid   | int(11) | NO   | PRI | NULL    |       |
+-------+---------+------+-----+---------+-------+
2 rows in set (0.00 sec)

mysql> DESCRIBE Passenger;
+--------------+-----------+------+-----+---------+-------+
| Field        | Type      | Null | Key | Default | Extra |
+--------------+-----------+------+-----+---------+-------+
| paid         | int(11)   | NO   | PRI | NULL    |       |
| name         | char(100) | YES  |     | NULL    |       |
| contact_info | char(20)  | YES  |     | NULL    |       |
| notVIP       | char(100) | YES  |     | NULL    |       |
+--------------+-----------+------+-----+---------+-------+
5 rows in set (0.00 sec)

mysql> DESCRIBE Staff Member;
ERROR 1146 (42S02): Table 'Airport.Staff' doesn't exist
mysql> DESCRIBE Staff_Member;
+--------------+---------+------+-----+---------+-------+
| Field        | Type    | Null | Key | Default | Extra |
+--------------+---------+------+-----+---------+-------+
| eid          | int(11) | NO   | PRI | NULL    |       |
| contact_info | double  | YES  |     | NULL    |       |
+--------------+---------+------+-----+---------+-------+
2 rows in set (0.00 sec)
```

SQL for At Most

```
CREATE TABLE Serves (
paid integer NOT NULL,
eid integer NOT NULL,
PRIMARY KEY (eid),
FOREIGN KEY (paid) REFERENCES Professor (paid) ON DELETE CASCADE,
FOREIGN KEY (eid) REFERENCES Course (eid)) ON DELETE CASCADE;

CREATE TABLE Passenger (
paid integer NOT NULL,
name CHAR(100),
contact_info CHAR(20),
```

```
notVIP CHAR(100),
PRIMARY KEY (paid));

CREATE TABLE Staff_Member (
eid integer NOT NULL,
contact_info real,
PRIMARY KEY (eid),
FOREIGN KEY (eid) REFERENCES Employee (eid));
```

TRIGGERS:

```
CREATE TRIGGER ins_sum BEFORE INSERT ON account
   -> FOR EACH ROW SET @sum = @sum + NEW.amount;
```

```
CREATE TRIGGER flight_status_change BEFORE UPDATE ON Flight
FOR EACH ROW
BEGIN
        status_change = New.status;
        dbms_output.put_line('Old status: ' || OLD.status);
        dbms_output.put_line('New status: ' || New.status);
END;
```

-This is the trigger for the change in status of a Flight. This trigger only occur when an admin, or any other person with the authority, changes the status of a Flight. Examples of status change are “delayed” to “on time”, vice-versa and so on. This trigger is not activated when a new Flight instances is added or deleted, as that instance cannot be found anymore, and so its status becomes irrelevant. Not having a trigger like this would mean that when a new status is added into the Flight view or table, a new instance would be created. This would mean we have the same instance of a flight entity, with just different status. This would make it confusing to the passenger looking up information about their flight. A real life scenario that shows the effect of this trigger would be when a passenger is viewing the timing of their flight, and an admin changes the status of a flight. The state of the flight instances that pertains to that specific passenger must be changed e.g., when the passenger refreshes the view of their flight, the status should change.

```
CREATE TRIGGER flight_terminal_change BEFORE UPDATE ON Flight
FOR EACH ROW
BEGIN
        terminal_change = New.status;
        dbms_output.put_line('Old terminal: ' || OLD.terminal);
```

```
        dbms_output.put_line('New terminal: ' || New.terminal);
END;
```

-This is another trigger for the Flight entity. This trigger represents the change that will occur when a terminal is changed for a flight. The real world scenario for this is when a plane has to make a change according to its landing strip and has to park at a different bay. If this trigger was not there, it would lead to problems if a new terminal was added for the same flight instances; it would lead to a duplicate of that flight instance with just different terminals. This would lead to confusion for the staffmem and passenger view, as they would not know which of the duplicate flight instances represents accurate data. A real life scenario that represents the effect of this trigger is when a passenger is going towards the terminal of their flight, A102. As they are making their way to through the airport, the admin changes the terminal of flight A102. This means that the passenger must immediately see that change in their view, and the view should refresh with the relevant flight information for the passenger.