DBMS Mini Project Airport Management System

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Short Description and Scope of the Project

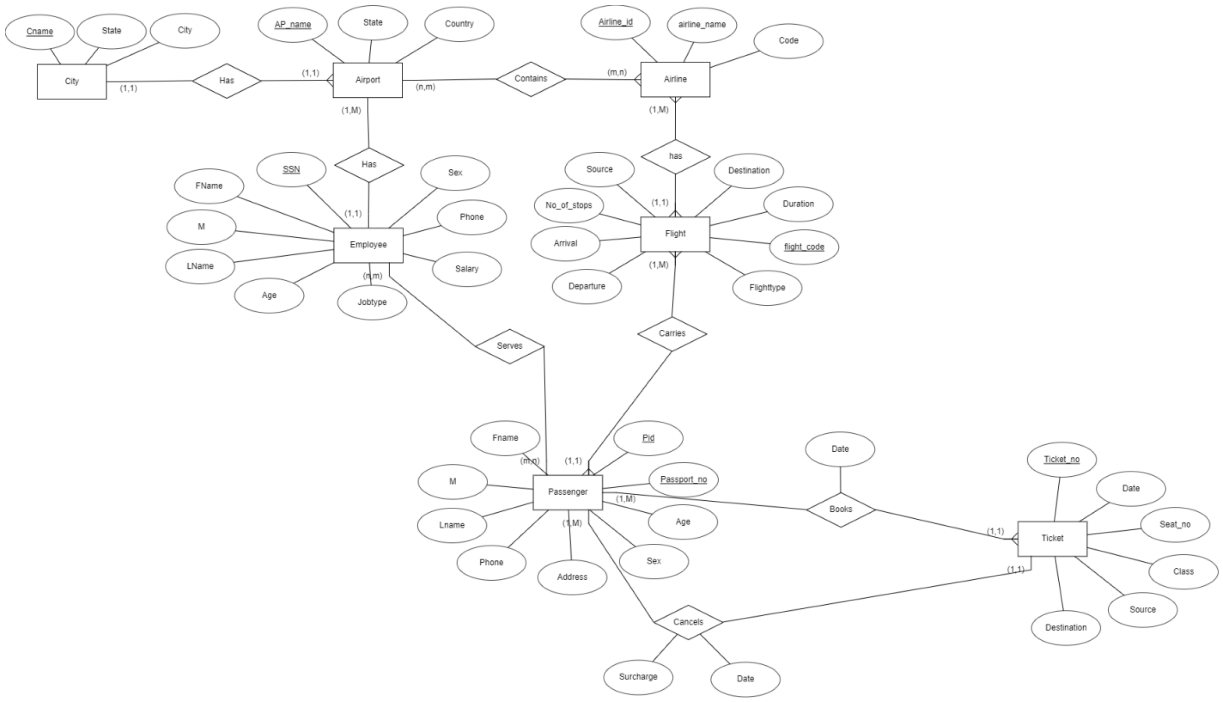
Airport Management System:

This project is a database that deals with the management and handling of an airport and its customers, employees, air traffic passing through it, etc. The system provides a broad overview of underlying operational factors influencing airport management.
There are 4 significant parts to the database:

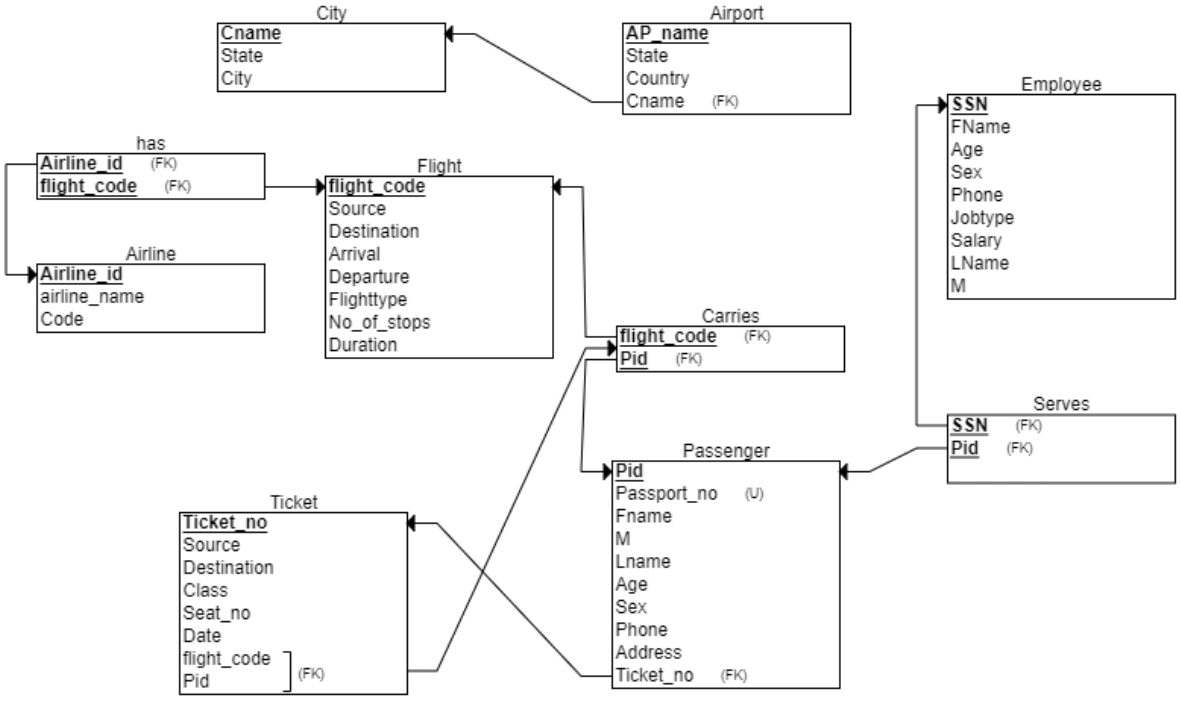
- Clients
- Employees
- Airlines
- Tickets

This project's scope is to show that a very detailed airport database can be created and managed with ease and can further be expanded upon to be applied to more operations occurring in an airport.

ER Diagram


Cname
State
City
City
(1,1)
Has
AP_name
State
Country
Airport
(1,1)
(1,M)
Contains
(n,m)
Airline_Id
airline_name
Code
Airline
(m,n)
(1,M)
Has
SSN
Sex
FName
M
LName
Age
Jobtype
Phone
Salary
Employee
(1,1)
(n,m)
has
Source
Destination
No_of_stops
Arrival
Departure
Duration
flight_code
Flighttype
Flight
(1,1)
(1,M)
Serves
Carries
Fname
Pid
M
Lname
Phone
Address
Passport_no
Age
Sex
Passenger
(m,n)
(1,1)
(1,M)
(1,M)
Date
Books
Ticket_no
Date
Seat_no
Class
Source
Destination
Ticket
(1,1)
(1,1)
Cancels
Surcharge
Date

Relational Schema



DDL statements - Building the database

Specifying the city of the airport:

```
CREATE TABLE CITY(CNAME VARCHAR(15) NOT NULL,STATE VARCHAR(15),
COUNTRY VARCHAR(30), PRIMARY KEY(CNAME));
```

Airport details:

```
CREATE TABLE AIRPORT(AP_NAME VARCHAR(100) NOT NULL,STATE
VARCHAR(15), COUNTRY VARCHAR(30),CNAME VARCHAR(15),
PRIMARY KEY(AP_NAME),FOREIGN KEY(CNAME) REFERENCES CITY(CNAME)
ON DELETE CASCADE);
```

Airline details:

```
CREATE TABLE AIRLINE(AIRLINEID VARCHAR(3) NOT NULL,AL_NAME
VARCHAR(50),THREE_DIGIT_CODE VARCHAR(3), PRIMARY KEY(AIRLINEID));

CREATE TABLE CONTAINS(AIRLINEID VARCHAR(3) NOT NULL,AP_NAME
VARCHAR(100) NOT NULL, PRIMARY KEY(AIRLINEID, AP_NAME),
FOREIGN KEY(AIRLINEID) REFERENCES AIRLINE(AIRLINEID) ON DELETE
CASCADE,
FOREIGN KEY(AP_NAME) REFERENCES AIRPORT(AP_NAME) ON DELETE
CASCADE);

CREATE TABLE FLIGHT(FLIGHT_CODE VARCHAR(10) NOT NULL,SOURCE
VARCHAR(3),DESTINATION VARCHAR(3),ARRIVAL VARCHAR(10),
DEPARTURE VARCHAR(10),STATUS VARCHAR(10),DURATION
VARCHAR(30),FLIGHTTYPE VARCHAR(10),LAYOVER_TIME VARCHAR(30),
NO_OF_STOPS INT,AIRLINEID VARCHAR(3),
PRIMARY KEY(FLIGHT_CODE),
FOREIGN KEY(AIRLINEID) REFERENCES AIRLINE(AIRLINEID) ON DELETE
CASCADE);
```

Employee details:

```
CREATE TABLE EMPLOYEE1(SSN INT NOT NULL,FNAME VARCHAR(20),M
VARCHAR(1),LNAME VARCHAR(20),ADDRESS VARCHAR(100),
PHONE INT,AGE INT,SEX VARCHAR(1),JOBTYPE VARCHAR(30),ASTYPE
VARCHAR(30),ETYPE VARCHAR(30),SHIFT VARCHAR(20),
POSITION VARCHAR(30),AP_NAME VARCHAR(100),
PRIMARY KEY(SSN),
FOREIGN KEY(AP_NAME) REFERENCES AIRPORT(AP_NAME) ON DELETE
CASCADE);
```

```
CREATE TABLE EMPLOYEE2(JOBTYPE VARCHAR(30) NOT NULL,SALARY INT,
PRIMARY KEY(JOBTYPE));
```

Ticket details:

```
CREATE TABLE TICKET1(TICKET_NUMBER INT NOT NULL,SOURCE
VARCHAR(3),DESTINATION VARCHAR(3),DATE_OF_BOOKING
DATE,DATE_OF_TRAVEL DATE,
SEATNO VARCHAR(5),CLASS VARCHAR(15),DATE_OF_CANCELLATION DATE,PID
INT,PASSPORTNO VARCHAR(10),
FOREIGN KEY(PID, PASSPORTNO) REFERENCES PASSENGER1(PID,
PASSPORTNO) ON DELETE CASCADE);

CREATE TABLE TICKET2(DATE_OF_BOOKING DATE NOT NULL,SOURCE
VARCHAR(3) NOT NULL,DESTINATION VARCHAR(3) NOT NULL,
CLASS VARCHAR(15) NOT NULL,PRICE INT,
PRIMARY KEY(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS));


CREATE TABLE TICKET3(DATE_OF_CANCELLATION DATE NOT
NULL,SURCHARGE INT,
PRIMARY KEY(DATE_OF_CANCELLATION));
```

Passenger details:

```
CREATE TABLE PASSENGER1(PID INT NOT NULL,PASSPORTNO VARCHAR(10)
NOT NULL,
PRIMARY KEY(PID, PASSPORTNO));

CREATE TABLE PASSENGER2(PASSPORTNO VARCHAR(10) NOT NULL,FNAME
VARCHAR(20),M VARCHAR(1),LNAME VARCHAR(20),ADDRESS VARCHAR(100),
PHONE INT,AGE INT,SEX VARCHAR(1),
PRIMARY KEY(PASSPORTNO));

CREATE TABLE PASSENGER3
(PID INT NOT NULL,FLIGHT_CODE VARCHAR(10),
PRIMARY KEY(PID),
FOREIGN KEY(FLIGHT_CODE) REFERENCES FLIGHT(FLIGHT_CODE) ON
DELETE CASCADE);
```

Populating the Database

Following are 1 example each of data inserted into each table in the database:

```
INSERT INTO CITY (CNAME, STATE, COUNTRY)
VALUES('Frankfurt','Hesse','Germany');

INSERT INTO AIRPORT (AP_NAME, STATE, COUNTRY, CNAME) VALUES('San Francisco International Airport','California', 'United States','San Francisco');

INSERT INTO AIRLINE (AIRLINEID, AL_NAME, THREE_DIGIT_CODE)
VALUES('LH','Lufthansa', '220');

INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('AA','San Francisco International Airport');

INSERT INTO FLIGHT(FLIGHT_CODE, SOURCE, DESTINATION, ARRIVAL, DEPARTURE, STATUS, DURATION, FLIGHTTYPE, LAYOVER_TIME, NO_OF_STOPS, AIRLINEID)
VALUES('EY1234','JFK','TPA','19:20','20:05','On-time','16hrs','Connecting',5,2,'EY');

INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(1,'A1234568');


INSERT INTO
PASSENGER2(PASSPORTNO,FNAME,M,LNAME,ADDRESS,PHONE,AGE,SEX)
VALUES('B9876541','ANKITA','V','AHIR','3456 VIKAS APTS, APT 102,DOMBIVLI, INDIA',8080367280,26,'F');

INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(3,'9W2334');

INSERT INTO EMPLOYEE1(SSN, FNAME, M, LNAME, ADDRESS, PHONE, AGE, SEX, JOBTYPE, ASTYPE, ETYPE, SHIFT, POSITION, AP_NAME)
VALUES (666884444,'SHELDON','A','COOPER','345 CHERRY PARK, HESSE,GERMANY',1254678903, 55, 'M','TRAFFIC MONITOR','','NIGHT','','','Frankfurt Airport');

INSERT INTO EMPLOYEE2(JOBTYPE, SALARY)VALUES('TRAFFIC MONITOR',80000);
```

```
INSERT INTO TICKET1(TICKET_NUMBER, SOURCE, DESTINATION,
DATE_OF_BOOKING, DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO,
CLASS, PID, PASSPORTNO)
VALUES(2206543545545,'BOM','DFW','11-NOV-16','','12-FEB-17','43B','ECONOMY',6,'
B8765430');

INSERT INTO TICKET2(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS,
PRICE)
VALUES('21-AUG-16','IAH','DEL','BUSINESS',200000);

INSERT INTO TICKET3(DATE_OF_CANCELLATION, SURCHARGE)
VALUES('10-DEC-16',75000);
```

Join Queries

1.Display first name, last name, address and passenger id of all passengers:

Query:

SELECT passenger1.pid,passenger2.fname,passenger2.lname,passenger2.address FROM passenger1 INNER JOIN passenger2 ON passenger1.passportno = passenger2.passportno;

Output Screenshot:

```
MariaDB [pes1ug20cs450]>
                    select passenger1.pid,passenger2.fname,passenger2.lname,passenger2.address from passenger1 inner join passenger2 on passenger1.passportno = passenger2.passportno;
+-----+-----------+---------+-----------------------------------------+
| pid | fname     | lname   | address                                 |
+-----+-----------+---------+-----------------------------------------+
|   1 | ALEN      | SMITH   | 2230 NORTHSIDE, APT 11, ALBANY, NY      |
|   2 | ANKITA    | AHIR    | 3456 VIKAS APTS, APT 102,DOMBIVLI, INDIA |
|   3 | KHYATI    | MISHRA  | 7820 MCCALLUM COURTS, APT 234, AKRON, OH |
|   4 | ANKITA    | PATIL   | 7720 MCCALLUM BLVD, APT 1082, DALLAS, TX |
|   5 | TEJASHREE | PANDIT  | 9082 ESTAES OF RICHARDSON, RICHARDSON, TX |
|   6 | LAKSHMI   | SHARMA  | 1110 FIR HILLS, APT 903, AKRON, OH      |
|   7 | AKHILESH  | JOSHI   | 345 CHATHAM COURTS, APT 678, MUMBAI, INDIA |
|   8 | MANAN     | LAKHANI | 5589 CHTHAM REFLECTIONS, APT 349 HOUSTON, TX |
|   9 | KARAN     | MOTANI  | 4444 FRANKFORD VILLA, APT 77, GUILDERLAND, NY |
|  10 | ROM       | SOLANKI | 7720 MCCALLUM BLVD, APT 2087, DALLAS, TX |
|  11 | John      | GATES   | 1234 BAKER APTS, APT 59, HESSE, GERMANY |
|  12 | SARA      | GOMES   | 6785 SPLITSVILLA, APT 34, MIAMI, FL     |
|  13 | ALIA      | BHAT    | 548 MARKET PLACE, SAN Francisco, CA     |
|  14 | JOHN      | SMITH   | 6666 ROCK HILL, APT 2902, TAMPA, FL     |
|  15 | RIA       | GUPTA   | 3355 PALENCIA, APT 2065, MUMBAI, INDIA  |
+-----+-----------+---------+-----------------------------------------+
15 rows in set (0.000 sec)
```

2.Display all valid airlines and all the possible airports each of them can travel to.

Query:

SELECT DISTINCT airline.AL_NAME, airline.three_digit_code,contains.ap_name FROM airline INNER JOIN contains ON airline.airlineid = contains.airlineid;

Output:

```
MariaDB [pes1ug20cs450]> select distinct airline.AL_NAME, airline.three_digit_code,contains.ap_name from airline inner join contains on airline.airlineid = contains.airlineid;
+------------------+-----------------+----------------------------------------+
| AL_NAME          | three_digit_code | ap_name                                |
+------------------+-----------------+----------------------------------------+
| American Airlines | 001             | George Bush Intercontinental Airport   |
| American Airlines | 001             | John F. Kennedy International Airport  |
| American Airlines | 001             | Louisville International Airport       |
| American Airlines | 001             | San Francisco International Airport    |
| American Airlines | 001             | Tampa International Airport            |
| Air India Limited | 098             | Chandigarh International Airport       |
| Air India Limited | 098             | Chhatrapati Shivaji International Airport |
| Air India Limited | 098             | Dallas/Fort Worth International Airport |
| Air India Limited | 098             | George Bush Intercontinental Airport   |
| Air India Limited | 098             | Indira GandhiInternational Airport     |
| British Airways   | 125             | Chandigarh International Airport       |
| British Airways   | 125             | Chhatrapati Shivaji International Airport |
| British Airways   | 125             | Frankfurt Airport                      |
| British Airways   | 125             | John F. Kennedy International Airport  |
| British Airways   | 125             | San Francisco International Airport    |
| Lufthansa         | 220             | Chhatrapati Shivaji International Airport |
| Lufthansa         | 220             | Dallas/Fort Worth International Airport |
| Lufthansa         | 220             | Frankfurt Airport                      |
| Lufthansa         | 220             | John F. Kennedy International Airport  |
| Lufthansa         | 220             | San Francisco International Airport    |
| Qatar Airways     | 157             | Chhatrapati Shivaji International Airport |
| Qatar Airways     | 157             | Dallas/Fort Worth International Airport |
| Qatar Airways     | 157             | John F. Kennedy International Airport  |
| Qatar Airways     | 157             | Louisville International Airport       |
| Qatar Airways     | 157             | Tampa International Airport            |
+------------------+-----------------+----------------------------------------+
25 rows in set (0.001 sec)
```

3. List employee details and the salary they receive according to their job.

Query:

SELECT e1.ssn,e1.fname,e1.lname,e2.salary FROM employee1 as e1 INNER JOIN employee2 as e2 ON e1.jobtype = e2.jobtype;

Output:

```
MariaDB [pes1ug20cs450]> select e1.ssn,e1.fname,e1.lname,e1.jobtype,e2.salary from employee1 as e1 inner join employee2 as e2 on e1.jobtype = e2.jobtype;
+-----------+----------+---------+-----------------------+--------+
| ssn       | fname    | lname   | jobtype               | salary |
+-----------+----------+---------+-----------------------+--------+
| 123456789 | LINDA    | GOODMAN | ADMINISTRATIVE SUPPORT |  50000 |
| 125478909 | PRATIK   | GOMES   | TRAFFIC MONITOR       |  80000 |
| 324567897 | ADIT     | DESAI   | TRAFFIC MONITOR       |  80000 |
| 333445555 | JOHNY    | PAUL    | ADMINISTRATIVE SUPPORT |  50000 |
| 453453453 | RAJ      | SHARMA  | AIRPORT AUTHORITY     |  90000 |
| 666884444 | SHELDON  | COOPER  | TRAFFIC MONITOR       |  80000 |
| 888665555 | SHUBHAM  | GUPTA   | ADMINISTRATIVE SUPPORT |  50000 |
| 987654321 | SHERLOCK | HOLMES  | TRAFFIC MONITOR       |  80000 |
| 987987987 | NIKITA   | PAUL    | ENGINEER              |  70000 |
| 999887777 | JAMES    | BOND    | ENGINEER              |  70000 |
+-----------+----------+---------+-----------------------+--------+
10 rows in set (0.001 sec)
```

4.Find out which employees serve which customer and list both their full names.

Query:

SELECT passenger1.pid,passenger2.fname,passenger2.lname,passenger2.passportno,serves.ssn,employee1.fname,employee1.lname FROM passenger1 INNER JOIN passenger2 ON passenger1.passportno = passenger2.passportno INNER JOIN serves ON serves.pid = passenger1.pid INNER JOIN employee1 ON serves.ssn = employee1.ssn;

Output:

```
MariaDB [pes1ug20cs450]> select passenger1.pid,passenger2.fname,passenger2.lname,passenger2.passportno,serves.ssn,employee1.fname,employee1.lname from passenger1 inner join passenger2 on passenger1.passportno =
passenger2.passportno inner join serves on serves.pid = passenger1.pid inner join employee1 on serves.ssn = employee1.ssn;
+-----+---------+---------+-----------+-----------+---------+---------+
| pid | fname   | lname   | passportno | ssn       | fname   | lname   |
+-----+---------+---------+-----------+-----------+---------+---------+
|   1 | ALEN    | SMITH   | A1234568  | 123456789 | LINDA   | GOODMAN |
|   7 | AKHILESH | JOSHI  | J9801235  | 123456789 | LINDA   | GOODMAN |
|   9 | KARAN   | MOTANI  | Q1243567  | 123456789 | LINDA   | GOODMAN |
|  15 | RIA     | GUPTA   | R8990566  | 123456789 | LINDA   | GOODMAN |
|  10 | ROM     | SOLANKI | S1243269  | 333445555 | JOHNY   | PAUL    |
|  12 | SARA    | GOMES   | K3212322  | 333445555 | JOHNY   | PAUL    |
|   4 | ANKITA  | PATIL   | D1002004  | 888665555 | SHUBHAM | GUPTA   |
|   7 | AKHILESH | JOSHI  | J9801235  | 888665555 | SHUBHAM | GUPTA   |
|  12 | SARA    | GOMES   | K3212322  | 888665555 | SHUBHAM | GUPTA   |
|  13 | ALIA    | BHAT    | P3452390  | 888665555 | SHUBHAM | GUPTA   |
+-----+---------+---------+-----------+-----------+---------+---------+
10 rows in set (0.001 sec)
```

Aggregate Functions

1.Display the number of employees working in each field in the airport.

Query:

SELECT jobtype, count(*) FROM employee1 GROUP BY jobtype;

Output:

```
MariaDB [pes1ug20cs450]> select jobtype, count(*) from employee1 group by jobtype;
+-------------------------+----------+
| jobtype                 | count(*) |
+-------------------------+----------+
| ADMINISTRATIVE SUPPORT  |        3 |
| AIRPORT AUTHORITY       |        1 |
| ENGINEER                |        2 |
| TRAFFIC MONITOR         |        4 |
+-------------------------+----------+
4 rows in set (0.001 sec)
```

2.Display the flight details of the longest flight of each type

Query:

SELECT flight_code,flighttype,duration FROM flight INNER JOIN (SELECT flighttype as ft,max(duration) as maxd FROM flight GROUP BY flighttype) as f1 ON flight.flighttype = f1.ft AND flight.duration = f1.maxd;

Output:

```
MariaDB [pes1ug20cs450]> select flight_code,flighttype,duration from flight inner join (select flighttype as ft,max(duration) as maxd from flight group by flighttype) as f1 on flight.flighttype = f1.ft and flight.duration = f1.maxd;
+-------------+------------+----------+
| flight_code | flighttype | duration |
+-------------+------------+----------+
| 9W2334      | Direct     | 23hrs    |
| BA3056      | Connecting | 29hrs    |
| EK3456      | Non-stop   | 30hrs    |
+-------------+------------+----------+
3 rows in set (0.001 sec)
```

3.Show the average age per sex of all passengers who are majors(>=18yrs).

Query:

SELECT sex, AVG(age) FROM passenger2 WHERE age > 17 GROUP BY sex;

Output:

```
MariaDB [pes1ug20cs450]> select sex,avg(age) from passenger2 where age > 17 group by sex;
+------+----------+
| sex  | avg(age) |
+------+----------+
| F    |  27.0000 |
| M    |  39.2000 |
+------+----------+
2 rows in set (0.001 sec)
```

4.Display all unique carriers that are flying.

Query:

SELECT COUNT (distinct airlineid) FROM flight;

Output:

```
MariaDB [pes1ug20cs450]> select count(distinct airlineid) from flight;
+--------------------------+
| count(distinct airlineid) |
+--------------------------+
|                        8 |
+--------------------------+
1 row in set (0.000 sec)
```

Set Operations

1.Select all employees who are either engineers or traffic monitors:

Query: SELECT ssn,fname,jobtype FROM employee1 WHERE jobtype="Traffic Monitor" UNION SELECT ssn,fname,jobtype FROM employee1 WHERE jobtype="engineer";

```
MariaDB [pes1ug20cs450]> select ssn,fname,jobtype from employee1 where jobtype="Traffic Monitor" union select ssn,fname,jobtype from employee1 where jobtype="engineer";
+-----------+---------+-----------------+
| ssn       | fname   | jobtype         |
+-----------+---------+-----------------+
| 125478909 | PRATIK  | TRAFFIC MONITOR |
| 324567897 | ADIT    | TRAFFIC MONITOR |
| 666884444 | SHELDON | TRAFFIC MONITOR |
| 987654321 | SHERLOCK| TRAFFIC MONITOR |
| 987987987 | NIKITA  | ENGINEER        |
| 999887777 | JAMES   | ENGINEER        |
+-----------+---------+-----------------+
6 rows in set (0.002 sec)
```

2.Select all flights that are direct flights without any stopping in between.

Query: SELECT * FROM flight where no_of_stops=0 INTERSECT SELECT * FROM flight WHERE flighttype="direct";

```
MariaDB [pes1ug20cs450]> SELECT * FROM flight where no_of_stops=0 INTERSECT SELECT * FROM flight WHERE flighttype="direct";
+-------------+--------+-------------+----------+-----------+---------+----------+------------+--------------+-------------+-----------+
| FLIGHT_CODE | SOURCE | DESTINATION | ARRIVAL  | DEPARTURE | STATUS  | DURATION | FLIGHTTYPE | LAYOVER_TIME | NO_OF_STOPS | AIRLINEID |
+-------------+--------+-------------+----------+-----------+---------+----------+------------+--------------+-------------+-----------+
| 9W2334      | IAH    | DEL         | 23:00:00 | 13:45:00  | On-time | 23hrs    | Direct     | 0            |           0 | 9W        |
+-------------+--------+-------------+----------+-----------+---------+----------+------------+--------------+-------------+-----------+
1 row in set (0.001 sec)
```

3.Select all economy class tickets to Delhi.

Query: SELECT * FROM ticket1 where destination="DEL" INTERSECT SELECT * FROM ticket1 WHERE class="economy";

```
MariaDB [pes1ug20cs450]> SELECT * FROM ticket1 where destination="DEL" INTERSECT SELECT * FROM ticket1 WHERE class="economy";
+---------------+--------+-------------+-----------------+----------------+--------+---------+----------------------+------+------------+
| TICKET_NUMBER | SOURCE | DESTINATION | DATE_OF_BOOKING | DATE_OF_TRAVEL | SEATNO | CLASS   | DATE_OF_CANCELLATION | PID  | PASSPORTNO |
+---------------+--------+-------------+-----------------+----------------+--------+---------+----------------------+------+------------+
|    2147483647 | FRA    | DEL         | 0000-00-00      | 0000-00-00     | 57F    | ECONOMY | 0000-00-00           |   11 | E3277889   |
|    2147483647 | FRA    | DEL         | 0000-00-00      | 0000-00-00     | 55C    | ECONOMY | 0000-00-00           |   14 | W7543336   |
+---------------+--------+-------------+-----------------+----------------+--------+---------+----------------------+------+------------+
2 rows in set (0.002 sec)
```

4.Select all female passengers who don’t have passport number starting with ‘B’

Query: SELECT * FROM passenger2 where sex="F" EXCEPT SELECT * FROM passenger2 WHERE passportno like "B%";

```
MariaDB [pes1ug20cs450]> SELECT * FROM passenger2 where sex="F" EXCEPT SELECT * FROM passenger2 WHERE passportno like "B%";
+------------+-----------+------+---------+-----------------------------------------------+------------+------+------+
| PASSPORTNO | FNAME     | M    | LNAME   | ADDRESS                                       | PHONE      | AGE  | SEX  |
+------------+-----------+------+---------+-----------------------------------------------+------------+------+------+
| A1122334   | MANAN     | S    | LAKHANI | 5589 CHTHAM REFLECTIONS, APT 349 HOUSTON, TX | 2147483647 |   25 | F    |
| C2345698   | KHYATI    | A    | MISHRA  | 7820 MCCALLUM COURTS, APT 234, AKRON, OH      | 2147483647 |   30 | F    |
| D1002004   | ANKITA    | S    | PATIL   | 7720 MCCALLUM BLVD, APT 1082, DALLAS, TX      | 2147483647 |   23 | F    |
| K3212322   | SARA      | B    | GOMES   | 6785 SPLITSVILLA, APT 34, MIAMI, FL           | 2147483647 |   15 | F    |
| P3452390   | ALIA      | V    | BHAT    | 548 MARKET PLACE, SAN Francisco, CA           | 2147483647 |   10 | F    |
| X9324666   | TEJASHREE | B    | PANDIT  | 9082 ESTAES OF RICHARDSON, RICHARDSON, TX     | 2147483647 |   28 | F    |
+------------+-----------+------+---------+-----------------------------------------------+------------+------+------+
6 rows in set (0.004 sec)
```

Functions and Procedures

Create a Function and Procedure. State the objective of the function / Procedure. Run and display the results.

Procedure for Details of all employees in ascending order of their ssn:

Query:

```
DELIMITER $$
CREATE PROCEDURE OrderEmployeeSSN()
BEGIN
SELECT ssn,fname,lname,address FROM employee1 order by ssn asc;
END;$$
```

Output:

```
CALL `OrderEmployeeSSN`();
```

Execution results of routine `OrderEmployeeSSN`

ssn	fname	lname	address
123456789	LINDA	GOODMAN	731 Fondren, Houston, TX
125478909	PRATIK	GOMES	334 VITRUVIAN PARK, ALBANY, NY
324567897	ADIT	DESAI	987 SOMNATH, CHANDIGARH, INDIA
333445555	JOHNY	PAUL	638 Voss, Houston, TX
453453453	RAJ	SHARMA	345 FLOYDS, MUMBAI,INDIA
666884444	SHELDON	COOPER	345 CHERRY PARK, HESSE,GERMANY
888665555	SHUBHAM	GUPTA	567 CHANDANI CHOWK, DELHI, INDIA
987654321	SHERLOCK	HOLMES	123 TOP HILL, SAN Francisco,CA
987987987	NIKITA	PAUL	110 SYNERGY PARK, DALLAS,TX
999887777	JAMES	BOND	3321 Castle, Spring, TX

Function to extract the total flight duration from the arrival and departure dates in seconds.

Query:

```
DELIMITER //
CREATE FUNCTION no_of_hours(date1 time,date2 time) RETURNS int DETERMINISTIC
BEGIN
```

```
RETURN select abs(timestampdiff(minute,date1,date2));
END
//DELIMITER;
```

Output:

```
MariaDB [pes1ug20cs450]> select flight_code,flighttype,no_of_years(arrival,departure) as dur from flight;
+-------------+------------+------+
| flight_code | flighttype | dur  |
+-------------+------------+------+
| 9W2334      | Direct     |  555 |
| AA4367      | Non-stop   |   45 |
| AI2014      | Connecting |   65 |
| BA1689      | Non-stop   |   35 |
| BA3056      | Connecting |   40 |
| EK3456      | Non-stop   |   50 |
| EY1234      | Connecting |   45 |
| LH9876      | Non-stop   |   45 |
| QR1902      | Non-stop   |   50 |
| QR2305      | Non-stop   |   55 |
+-------------+------------+------+
10 rows in set (0.001 sec)

MariaDB [pes1ug20cs450]>
```

Triggers and Cursors

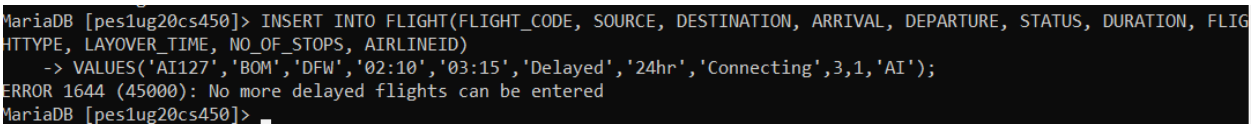
Create a Trigger and a Cursor. State the objective. Run and display the results.

1.Create a trigger to stop insertion of more delayed flights into the main flight table in order to prevent a backlog of flights.

Query:

```
DELIMITER $$
CREATE OR REPLACE TRIGGER DELAYEDFLIGHTS
BEFORE INSERT
ON FLIGHT FOR EACH ROW
BEGIN
DECLARE msg VARCHAR(255);
SET msg = ('No more delayed flights can be entered');

IF new.STATUS ='delayed' THEN


SIGNAL SQLSTATE '45000'
SET MESSAGE_TEXT = msg;
END IF;
END
$$
DELIMITER;
```

Output:



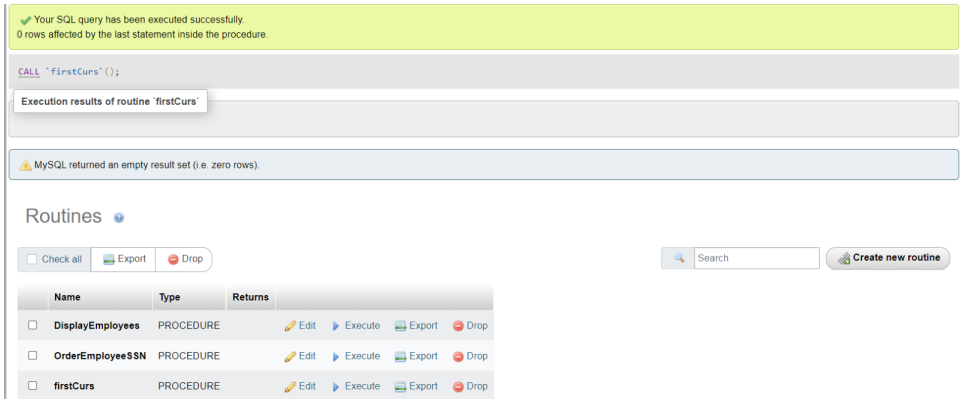
2.Create a cursor to store customer name and address in a separate table.

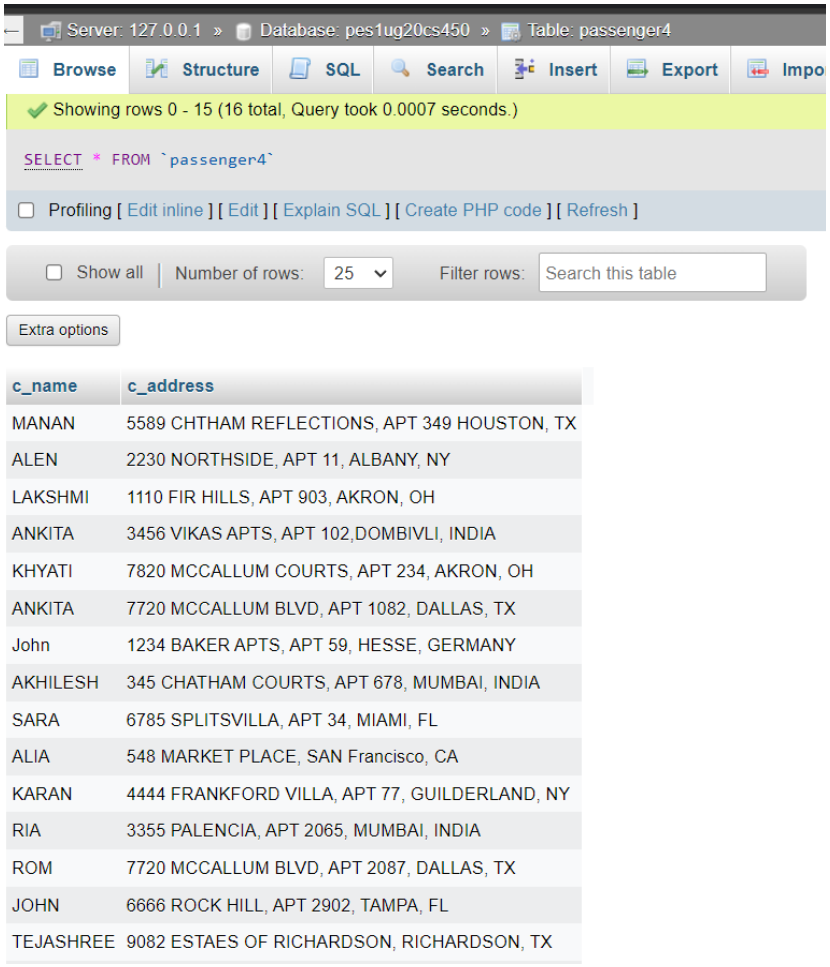
Query:

```
delimiter //
CREATE PROCEDURE firstCurs()
BEGIN
DECLARE d INT DEFAULT 0;
DECLARE c_name, c_address VARCHAR(150);

DECLARE Get_cur CURSOR FOR SELECT fname,address FROM passenger2;
DECLARE CONTINUE HANDLER FOR SQLSTATE '02000'
SET d = 1;
```

```
DECLARE CONTINUE HANDLER FOR SQLSTATE '23000'
SET d = 1;

OPEN Get_cur;
lbl: LOOP
IF d = 1 THEN
LEAVE lbl;
END IF;
IF NOT d = 1 THEN

FETCH Get_cur INTO c_name, c_address;
INSERT INTO passenger4 VALUES(c_name,c_address);
END IF;
END LOOP;

CLOSE Get_cur;
END
//
```

Output:



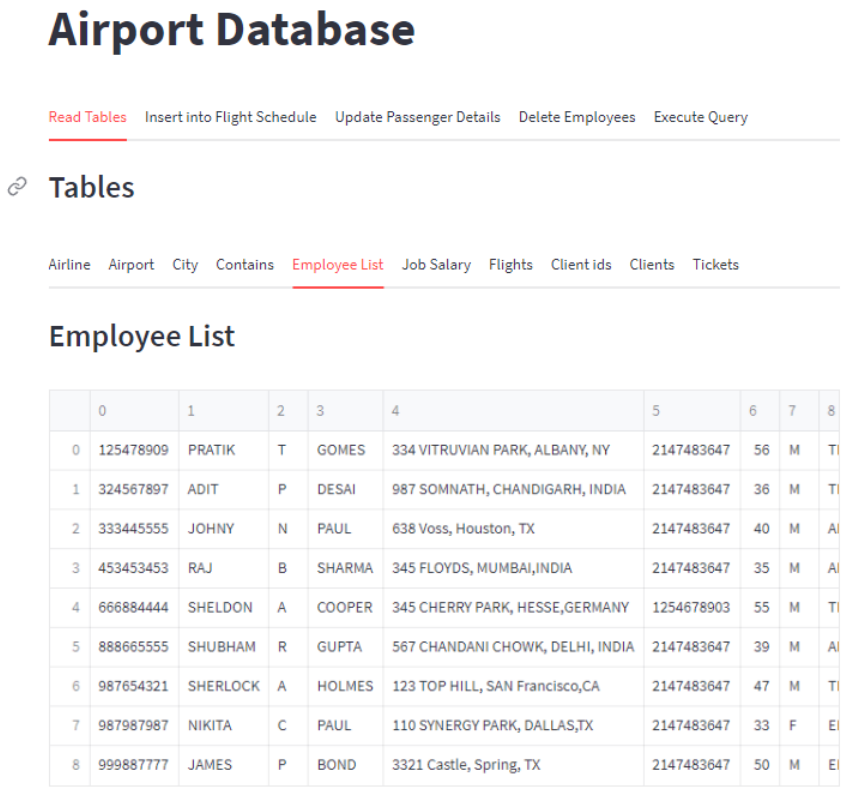


c_name	c_address
MANAN	5589 CHTHAM REFLECTIONS, APT 349 HOUSTON, TX
ALEN	2230 NORTHSIDE, APT 11, ALBANY, NY
LAKSHMI	1110 FIR HILLS, APT 903, AKRON, OH
ANKITA	3456 VIKAS APTS, APT 102,DOMBIVLI, INDIA
KHYATI	7820 MCCALLUM COURTS, APT 234, AKRON, OH
ANKITA	7720 MCCALLUM BLVD, APT 1082, DALLAS, TX
John	1234 BAKER APTS, APT 59, HESSE, GERMANY
AKHILESH	345 CHATHAM COURTS, APT 678, MUMBAI, INDIA
SARA	6785 SPLITSVILLA, APT 34, MIAMI, FL
ALIA	548 MARKET PLACE, SAN Francisco, CA
KARAN	4444 FRANKFORD VILLA, APT 77, GUILDERLAND, NY
RIA	3355 PALENCIA, APT 2065, MUMBAI, INDIA
ROM	7720 MCCALLUM BLVD, APT 2087, DALLAS, TX
JOHN	6666 ROCK HILL, APT 2902, TAMPA, FL
TEJASHREE	9082 ESTAES OF RICHARDSON, RICHARDSON, TX

Developing a Frontend

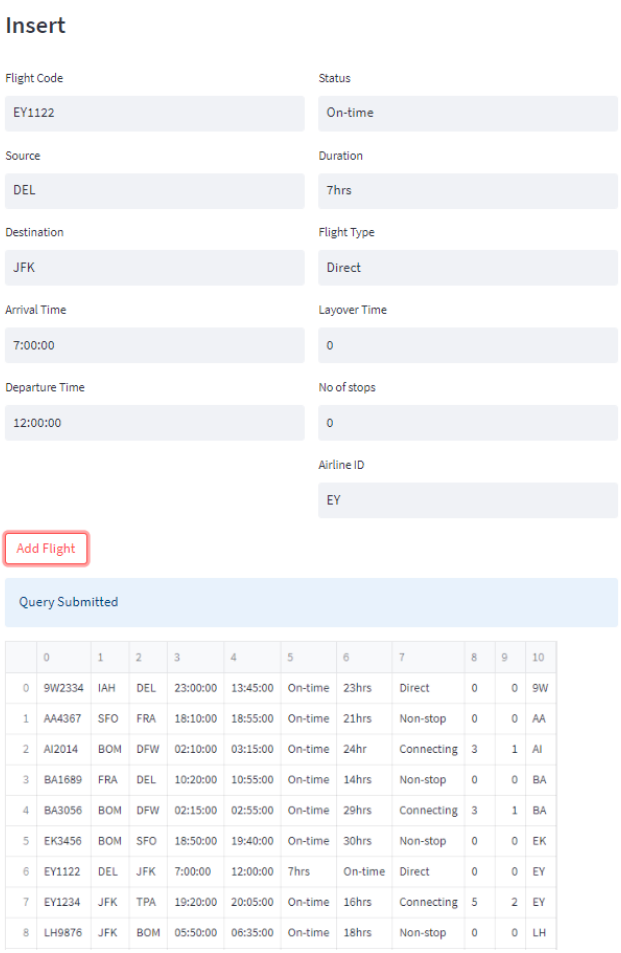
The frontend should support

1. Addition, Modification and Deletion of records from any chosen table



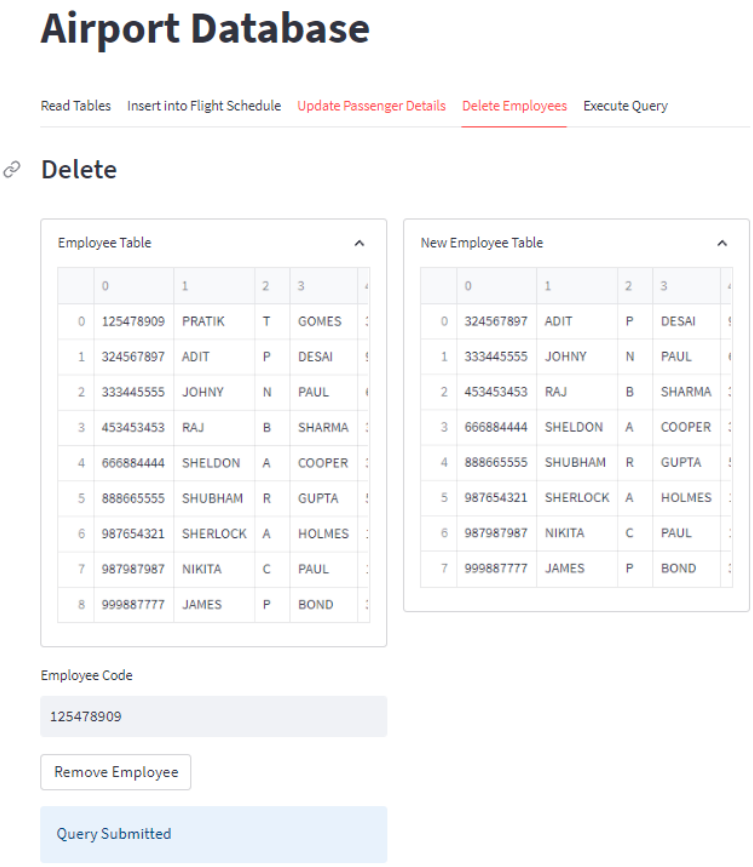
	0	1	2	3	4	5	6	7	8
0	125478909	PRATIK	T	GOMES	334 VITRUVIAN PARK, ALBANY, NY	2147483647	56	M	T
1	324567897	ADIT	P	DESAI	987 SOMNATH, CHANDIGARH, INDIA	2147483647	36	M	T
2	333445555	JOHNY	N	PAUL	638 Voss, Houston, TX	2147483647	40	M	A
3	453453453	RAJ	B	SHARMA	345 FLOYDS, MUMBAI,INDIA	2147483647	35	M	A
4	666884444	SHELDON	A	COOPER	345 CHERRY PARK, HESSE,GERMANY	1254678903	55	M	T
5	888665555	SHUBHAM	R	GUPTA	567 CHANDANI CHOWK, DELHI, INDIA	2147483647	39	M	A
6	987654321	SHERLOCK	A	HOLMES	123 TOP HILL, SAN Francisco,CA	2147483647	47	M	T
7	987987987	NIKITA	C	PAUL	110 SYNERGY PARK, DALLAS,TX	2147483647	33	F	E
8	999887777	JAMES	P	BOND	3321 Castle, Spring, TX	2147483647	50	M	E

Inserting a tuple:



	0	1	2	3	4	5	6	7	8	9	10
0	9W2334	IAH	DEL	23:00:00	13:45:00	On-time	23hrs	Direct	0	0	9W
1	AA4367	SFO	FRA	18:10:00	18:55:00	On-time	21hrs	Non-stop	0	0	AA
2	AI2014	BOM	DFW	02:10:00	03:15:00	On-time	24hr	Connecting	3	1	AI
3	BA1689	FRA	DEL	10:20:00	10:55:00	On-time	14hrs	Non-stop	0	0	BA
4	BA3056	BOM	DFW	02:15:00	02:55:00	On-time	29hrs	Connecting	3	1	BA
5	EK3456	BOM	SFO	18:50:00	19:40:00	On-time	30hrs	Non-stop	0	0	EK
6	EY1122	DEL	JFK	7:00:00	12:00:00	7hrs	On-time	Direct	0	0	EY
7	EY1234	JFK	TPA	19:20:00	20:05:00	On-time	16hrs	Connecting	5	2	EY
8	LH9876	JFK	BOM	05:50:00	06:35:00	On-time	18hrs	Non-stop	0	0	LH

Deleting a tuple:



Employee Table

	0	1	2	3
0	125478909	PRATIK	T	GOMES
1	324567897	ADIT	P	DESAI
2	333445555	JOHNY	N	PAUL
3	453453453	RAJ	B	SHARMA
4	666884444	SHELDON	A	COOPER
5	888665555	SHUBHAM	R	GUPTA
6	987654321	SHERLOCK	A	HOLMES
7	987987987	NIKITA	C	PAUL
8	999887777	JAMES	P	BOND

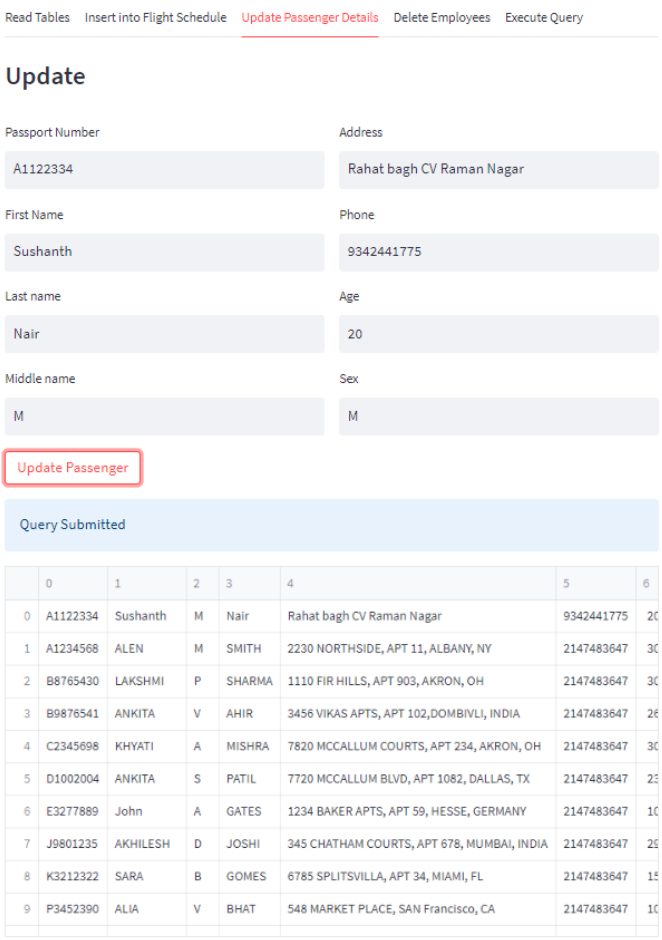
New Employee Table

	0	1	2	3
0	324567897	ADIT	P	DESAI
1	333445555	JOHNY	N	PAUL
2	453453453	RAJ	B	SHARMA
3	666884444	SHELDON	A	COOPER
4	888665555	SHUBHAM	R	GUPTA
5	987654321	SHERLOCK	A	HOLMES
6	987987987	NIKITA	C	PAUL
7	999887777	JAMES	P	BOND

Modify a table:(Modifying phone number and address for id A1122334)
Before update:

	PASSPORTNO	FNAME	M	LNAME	ADDRESS	PHONE	AGE	SEX
Edit Copy Delete	A1122334	Sushanth	M	Nair	5589 CHTHAM REFLECTIONS, APT 349 HOUSTON, TX	8951880533.	20	M
Edit Copy Delete	A1234568	ALEN	M	SMITH	2230 NORTHSIDE, APT 11, ALBANY, NY	2147483647	30	M
Edit Copy Delete	B8765430	LAKSHMI	P	SHARMA	1110 FIR HILLS, APT 903, AKRON, OH	2147483647	30	F
Edit Copy Delete	B9876541	ANKITA	V	AHIR	3456 VIKAS APTS, APT 102,DOMBIVLI, INDIA	2147483647	26	F
Edit Copy Delete	C2345698	KHYATI	A	MISHRA	7820 MCCALLUM COURTS, APT 234, AKRON, OH	2147483647	30	F
Edit Copy Delete	D1002004	ANKITA	S	PATIL	7720 MCCALLUM BLVD, APT 1082, DALLAS, TX	2147483647	23	F
Edit Copy Delete	E3277889	John	A	GATES	1234 BAKER APTS, APT 59, HESSE, GERMANY	2147483647	10	M
Edit Copy Delete	J9801235	AKHILESH	D	JOSHI	345 CHATHAM COURTS, APT 678, MUMBAI, INDIA	2147483647	29	M
Edit Copy Delete	K3212322	SARA	B	GOMES	6785 SPLITSVILLA, APT 34, MIAMI, FL	2147483647	15	F
Edit Copy Delete	P3452390	ALIA	V	BHAT	548 MARKET PLACE, SAN Francisco, CA	2147483647	10	F
Edit Copy Delete	Q1243567	KARAN	M	MOTANI	4444 FRANKFORD VILLA, APT 77, GUILDERLAND, NY	2147483647	22	M
Edit Copy Delete	R8990566	RIA	T	GUPTA	3355 PALENCIA, APT 2065, MUMBAI, INDIA	2147483647	10	M
Edit Copy Delete	S1243269	ROM	A	SOLANKI	7720 MCCALLUM BLVD, APT 2087, DALLAS, TX	2147483647	60	M
Edit Copy Delete	W7543336	JOHN	P	SMITH	6666 ROCK HILL, APT 2902, TAMPA, FL	2147483647	55	M
Edit Copy Delete	X9324666	TEJASHREE	B	PANDIT	9082 ESTAES OF RICHARDSON, RICHARDSON, TX	2147483647	28	F

After Update:



	0	1	2	3	4	5	6
0	A1122334	Sushanth	M	Nair	Rahat bagh CV Raman Nagar	9342441775	20
1	A1234568	ALEN	M	SMITH	2230 NORTHSIDE, APT 11, ALBANY, NY	2147483647	30
2	B8765430	LAKSHMI	P	SHARMA	1110 FIR HILLS, APT 903, AKRON, OH	2147483647	30
3	B9876541	ANKITA	V	AHIR	3456 VIKAS APTS, APT 102,DOMBIVLI, INDIA	2147483647	26
4	C2345698	KHYATI	A	MISHRA	7820 MCCALLUM COURTS, APT 234, AKRON, OH	2147483647	30
5	D1002004	ANKITA	S	PATIL	7720 MCCALLUM BLVD, APT 1082, DALLAS, TX	2147483647	23
6	E3277889	John	A	GATES	1234 BAKER APTS, APT 59, HESSE, GERMANY	2147483647	10
7	J9801235	AKHILESH	D	JOSHI	345 CHATHAM COURTS, APT 678, MUMBAI, INDIA	2147483647	29
8	K3212322	SARA	B	GOMES	6785 SPLITSVILLA, APT 34, MIAMI, FL	2147483647	15
9	P3452390	ALIA	V	BHAT	548 MARKET PLACE, SAN Francisco, CA	2147483647	10

2.There should be a window to accept and run any SQL statement and display the result

Execute Query

Sql code here

```
Select AP_name,country from airport;
```

Excecute code

Query Submitted

```
Select AP_name,country from airport;
```

Table

	0	1
0	Chandigarh International Airport	India
1	Chhatrapati Shivaji International Airport	India
2	Dallas/Fort Worth International Airport	United States
3	Frankfurt Airport	Germany
4	George Bush Intercontinental Airport	United States
5	Indira GandhiInternational Airport	India
6	John F. Kennedy International Airport	United States
7	Louisville International Airport	United States
8	San Francisco International Airport	United States
9	Tampa International Airport	United States

Airport Database

Read Tables | Insert into Flight Schedule | Update Passenger Details | Delete Employees | Execute Query

Execute Query

Sql code here

```
SELECT ssn,fname,jobtype FROM employee1 WHERE jobtype="Traffic Monitor" UNION SELECT
ssn,fname,jobtype FROM employee1 WHERE jobtype="engineer";
```

Excecute code

Query Submitted

```
SELECT ssn,fname,jobtype FROM employee1 WHERE jobtype="Traffic Monitor" UNION SELE
```

Table

	0	1	2
0	125478909	PRATIK	TRAFFIC MONITOR
1	324567897	ADIT	TRAFFIC MONITOR
2	666884444	SHELDON	TRAFFIC MONITOR
3	987654321	SHERLOCK	TRAFFIC MONITOR
4	987987987	NIKITA	ENGINEER
5	999887777	JAMES	ENGINEER