DBMS Project 2023-24

AIRPORT MANAGEMENT SYSTEM

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Submitted to:

Dr. Manisha Kaushal

Submitted by:

Garvit Jain-102216089

Pranav Jain- 102216091

1. PROJECT DESCRIPTION

Domain: Airport Management System

1.1 Requirements of the system:

➢ The system is based on airport management. Airport management system primarily deals with management of airport, airlines and passengers. The system provides broad overview of underlying operational factors that influence the airport management.

➢ The database system has the data of all commercial service airports.

➢ An airport is located in a city.

➢ All International airlines operating through various countries across the world have their offices located in all major cities and airports they cover. Hence, an airport may have many airline offices.

➢ Every airline is identified uniquely by an airline code. Airline code is a two-letter airline designator. Airline also has three-digit code which is printed on an air ticket.

Airline Code

Airline Name	IATA Airline code/IATA Designator	3-DIGIT CODE
American Airlines	AA	1
Air India Limited	AI	98
Lufthansa	LH	220
British Airways	BA	125
Qatar Airways	QR	157
Jet Airways	9W	589
Emirates	EK	176
Ethiad Airways	EY	607

Reference: http://www.iata.org/publications/Pages/code-search.aspx

➢ Airline companies serve flights.

➢ Every flight is uniquely identified by a flight code. Flight code is a combination of an airline code and four-digit number.

○ Flight takes off from one airport and lands on another airport. Therefore, most important aspect of a flight is, its source and destination. Source and destination airports are identified using an airport's IATA code.

➢ International Air Transport Airport code is simply a location identifier. IATA code is a three-letter code designating many airports across the world. These codes are prominently displayed on baggage tags and printed on an air ticket.

Airport Code

Airport Name	IATA Airport code
Louisville International Airport	SDF
Chandigarh International Airport	IXC
Dallas/Fort Worth International Airport	DFW
Indira Gandhi International Airport	DEL
Chhatrapati Shivaji International Airport	BOM
San Francisco International Airport	SFO
Frankfurt Airport	FRA
George Bush Intercontinental Airport	IAH
John F. Kennedy International Airport	JFK
Tampa International Airport	TPA

Reference: http://www.iata.org/publications/Pages/code-search.aspx

- o Flight has an arrival time, departure time, duration. Flight has three types of classes- business, economy and first class.
- o Flight can be of two types such non-stop flight and a connecting flight.
- o Connecting flight is a flight which takes intermediate stop and changes a flight possibly change of an airline. But we are assuming that connecting flight does not change a flight that is at each stop, after layover time gets over, passengers aboard the same flight
- ➢ Flight serves passengers. Flight carries passengers from source to destination.
- ➢ A passenger is uniquely identified by a passenger id and a passport number.
  - o Every passenger has details such as name, address, age, sex, phone.
- ➢ For a passenger to travel by a flight, he needs a ticket. A ticket or air ticket is used to confirm that an individual has reserved a seat on a flight. With the ticket, a passenger is allowed to board the flight.
  - o An air ticket has information such as the passenger's name, the issuing airline, ticket number, source, destination, journey date, seat no, class, fare.
  - o Ticket number is the combination of airline's 3-digit code, 4-digit form number, 6-digit serial number.

Date	Description		
Saturday 01-Feb-14	American Airlines Flight: AA1511 Class: Economy Class Status Confirmed	Departure: Dallas/Fort Worth Intl Apt Time: 10:30AM (01-Feb-14) Aircraft: Boeing 737-800	Arrival: Fort Lauderdale/Hollywood Intl Apt, Terminal 3 Time: 2:10PM (01-Feb-14) Flight Duration: 0240 Baggage Allowance: 0PC

LAST NAME/First Name(s)	Ticket Type	Ticket Number	Airline Ref	Your Ref
SMITH LISA	Electronic Ticket	001 1234567890	EUJQNR	YIP4A7

- ➢ Hence, depending on airline, source, destination, journey date and most importantly class, which a passenger chooses fare or price of an air ticket is determined.
- ➢ A passenger can book one or multiple tickets. The day on which he books an air ticket is a booking date. Similarly, a passenger can cancel one or multiple tickets. The day on which he cancels an air ticket is cancellation date and there will be a surcharge that a passenger has to pay after cancelling a ticket.
- ➢ Every airport has employees working for it.
  - o Every employee is identified by SSN. Every employee has an information such name, address, phone, age, sex, salary.
  - o Employees in the role of administrative support, engineer, traffic controller and airport authority work at the airport.
  - o Every airline needs administrative support staff to keep the office running smoothly. The different positions include secretaries, data entry workers, receptionists, communications and PR specialists and human resources department.
  - o There are different types of engineers who work specifically with information technologies, electronics, flight structure, environmental regulations, etc.
  - o Traffic Monitor works in different shifts such as day or night.
  - o There are different positions that airport authorities might work at such as manager, attendee, assistant, pilot, etc.
- ➢ Employees working in the role of administrative support may help passengers with various tasks such as booking a flight ticket, solving passenger's questions, etc.

Assumptions:

- ➢ We are not considering privately managed airports. We are only considering publicly owned airports.
  Several Categories of airports:

  (1) Commercial Service airport

    These are publicly owned airports that serve aircrafts which provide scheduled passenger service.

  (2) Cargo Service airports

    These airports serve aircrafts carrying cargo only

    Reference: http://www.noisequest.psu.edu/aboutairports-typesofairports.html

- ➢ The system is designed only for international flights.
- ➢ A city has at most one international airport.
- ➢ For Connecting flights, flight and airline remains same at layover stops
- ➢ There are different types of jobs available at the airport. For simplicity our system considers a few jobs only.

2. ENTITIES

CITY

CNAME	STATE	COUNTRY

AIPORT

AP_NAME	STATE	COUNTRY

AIRLINE

AIRLINEID	AL_NAME	THREE_DIGIT_CODE

FLIGHT

FLIGHT_CODE	SOURCE	DESTINATION	ARRIVAL	DEPARTURE	STATUS	DURATION	FLIGHTTYPE
LAYOVER_TIME	NO_OF_STOPS						

PASSENGER

PID	PASSPORTNO	FNAME	M	LNAME	ADDRESS	PHONE	AGE	SEX

TICKET

TICKET_NUMBER	SOURCE	DESTINATION	DATE_OF_TRAVEL	SEATNO	CLASS	PRICE

EMPLOYEE

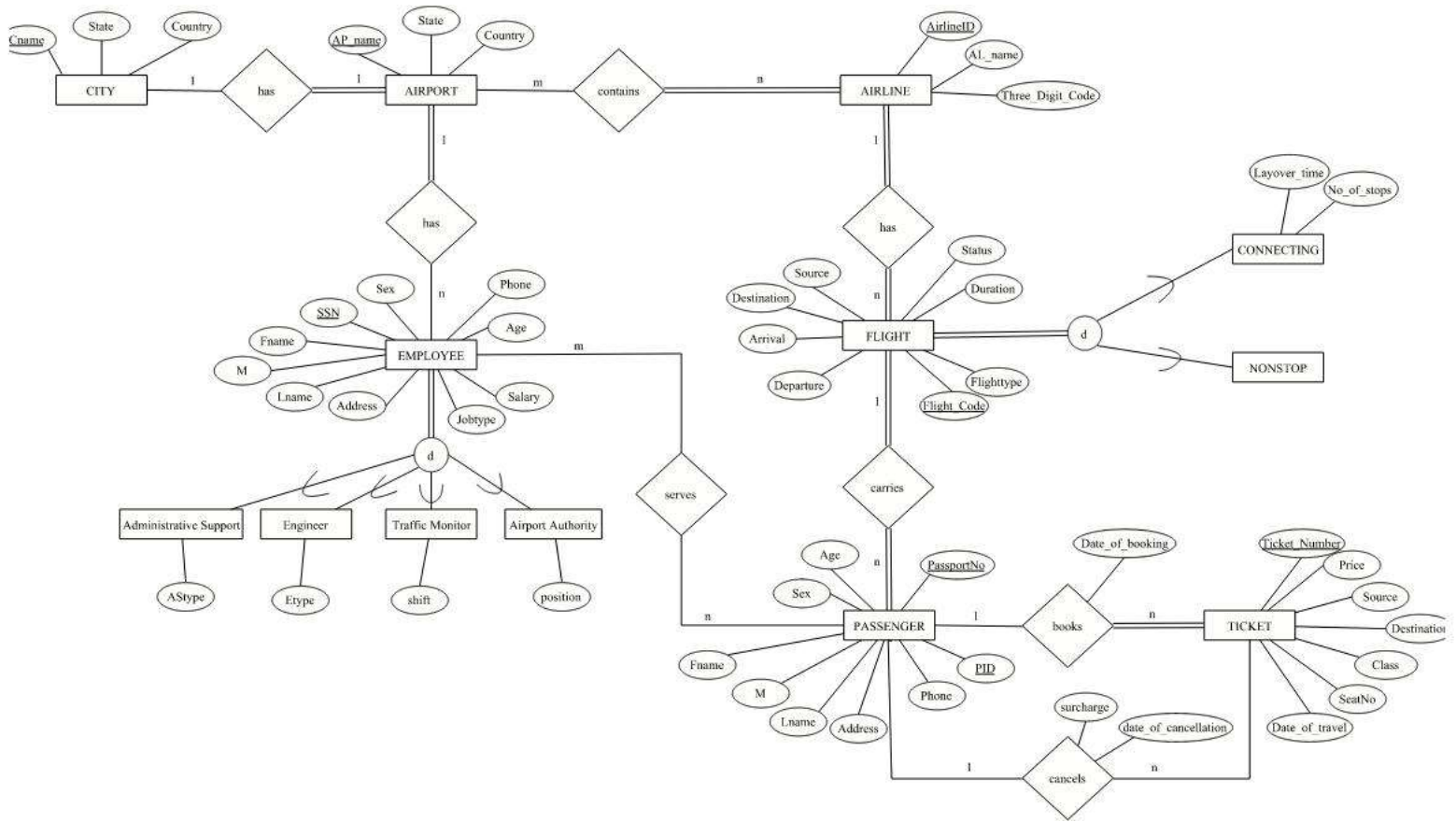| SSN	FNAME	M	LNAME	ADDRESS	PHONE	AGE	SEX	JOBTYPE	SALARY

3. ER DIAGRAM

Figure 1: Airport Management System ER Diagram

4. ER DIAGRAM

ER diagram contains following relationships

Entity 1	Name of the Relationship	Entity 2	Cardinality
City	has	Airport	1:1
Airport	contains	Airline	m : n
Airport	has	Employee	1 : n
Airline	has	Flight	1 : n
Flight	carries	Passengers	1 : n
Employee	serves	Passengers	m : n
Passenger	books	Ticket	1 : n
Passenger	cancels	Ticket	1 : n

Type of the binary relationship	Relationships in the system
one-to-one	(1 A city has only one airport.
one-to-many	(1) An airline has multiple flights, that is many flights belong to the same airline company. (2) A flight carries many passengers. (3) A passenger can book one or more tickets. (4) A passenger can cancel one or more tickets.
many-to-many	All International airlines operating through various countries across the world have their offices located in all major cities and airports they cover. Hence, an airport may have many airline offices.

6. NORMALIZATION RULES ON DATABASE

FUNCTIONAL DEPENDECIES	
PASSPORTNO -> FNAME, M, LNAME, ADDRESS, PHONE, AGE, SEX	Violates 2NF
PID -> FLIGHT_CODE	Violates 2NF
DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS -> PRICE	Violates 3NF
DATE_OF_CANCELLATION -> SURCHARGE	Violates 3NF
JOBTYPE -> SALARY	Violates 3NF

ER to Tables

TABLES DERIVED FROM ER AND AFTER NORMALIZING
CITY (CNAME, STATE, COUNTRY)   AIRPORT (AP_NAME, STATE, COUNTRY, CNAME)   AIRLINE (AIRLINEID, AL_NAME, THREE_DIGIT_CODE)   CONTAINS (AIRLINEID, AP_NAME)   FLIGHT (FLIGHT_CODE, SOURCE, DESTINATION, ARRIVAL, DEPARTURE, STATUS, DURATION, FLIGHTTYPE, LAYOVER_TIME, NO_OF_STOPS, AIRLINEID)   PASSENGER1 (PID, PASSPORTNO)   PASSENGER2(PASSPORTNO, FNAME, M, LNAME, ADDRESS, PHONE, AGE, SEX)   PASSENGER3 (PID, FLIGHT_CODE)   TICKET1 (TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING, DATE_OF_TRAVEL, SEATNO, CLASS, DATE_OF_CANCELLATION, PID, PASSPORTNO)   TICKET2 (DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE)   TICKET3 (DATE_OF_CANCELLATION, SURCHARGE)   EMPLOYEE1 (SSN, FNAME, M, LNAME, ADDRESS, PHONE, AGE, SEX, JOBTYPE, ASTYPE, ETYPE, SHIFT, POSITION, AP_NAME)   EMPLOYEE2(JOBTYPE, SALARY)   SERVES (SSN, PID, PASSPORTNO)

8. SQL

-- Inserting Table: CITY--

```
CREATE TABLE CITY
(CNAME VARCHAR2(15) NOT NULL,
STATE VARCHAR2(15),
COUNTRY VARCHAR(30),
PRIMARY KEY(CNAME));
```

-- Inserting values of Table: CITY--

```
INSERT INTO CITY (CNAME, STATE, COUNTRY) VALUES('Louisville','Kentucky','United States');
INSERT INTO CITY (CNAME, STATE, COUNTRY) VALUES ('Chandigarh','Chandigarh','India');
INSERT INTO CITY (CNAME, STATE, COUNTRY) VALUES ('Fort Worth','Texas','United States');
INSERT INTO CITY (CNAME, STATE, COUNTRY) VALUES('Delhi','Delhi','India');
INSERT INTO CITY (CNAME, STATE, COUNTRY) VALUES('Mumbai','Maharashtra','India');
INSERT INTO CITY (CNAME, STATE, COUNTRY) VALUES('San Francisco', 'California', 'United States');
INSERT INTO CITY (CNAME, STATE, COUNTRY) VALUES('Frankfurt','Hesse','Germany');
INSERT INTO CITY (CNAME, STATE, COUNTRY) VALUES('Houston','Texas','United States');
INSERT INTO CITY (CNAME, STATE, COUNTRY) VALUES('New York City','New York','United States');
INSERT INTO CITY (CNAME, STATE, COUNTRY) VALUES('Tampa', 'Florida', 'United States');
```

CNAME	STATE	COUNTRY
Louisville	Kentucky	United States
Chandigarh	Chandigarh	India
Fort Worth	Texas	United States
Delhi	Delhi	India
Mumbai	Maharashtra	India
San Francisco	California	United States
Frankfurt	Hesse	Germany
Houston	Texas	United States
New York City	New York	United States
Tampa	Florida	United States

-- Inserting Table: AIRPORT--

```
CREATE TABLE AIRPORT
(AP_NAME VARCHAR2(100) NOT NULL,
STATE VARCHAR2(15),
COUNTRY VARCHAR(30),
CNAME VARCHAR2(15),
PRIMARY KEY(AP_NAME),
FOREIGN KEY(CNAME) REFERENCES CITY(CNAME) ON DELETE CASCADE);
```

--Inserting values for Table: AIRPORT--

```
INSERT INTO AIRPORT (AP_NAME, STATE, COUNTRY, CNAME) VALUES('Louisville International
Airport','Kentucky','United States','Louisville');

INSERT INTO AIRPORT (AP_NAME, STATE, COUNTRY, CNAME) VALUES('Chandigarh International
Airport','Chandigarh','India','Chandigarh');


INSERT INTO AIRPORT (AP_NAME, STATE, COUNTRY, CNAME) VALUES('Dallas/Fort Worth International
Airport','Texas','United States','Fort Worth');

INSERT INTO AIRPORT (AP_NAME, STATE, COUNTRY, CNAME) VALUES('Indira GandhiInternational
Airport','Delhi','India','Delhi');


INSERT INTO AIRPORT (AP_NAME, STATE, COUNTRY, CNAME) VALUES('Chhatrapati Shivaji International
Airport','Maharashtra','India','Mumbai');


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

INSERT INTO AIRPORT (AP_NAME, STATE, COUNTRY, CNAME) VALUES('Frankfurt
Airport','Hesse','Germany','Frankfurt');


INSERT INTO AIRPORT (AP_NAME, STATE, COUNTRY, CNAME) VALUES('George Bush Intercontinental
Airport','Texas','United States','Houston');


INSERT INTO AIRPORT (AP_NAME, STATE, COUNTRY, CNAME) VALUES('John F. Kennedy International
Airport','New York','United States','New York City');


INSERT INTO AIRPORT (AP_NAME, STATE, COUNTRY, CNAME) VALUES('Tampa International
Airport','Florida', 'United States','Tampa');
```

AP_NAME	STATE	COUNTRY	CNAME
Louisville International Airport	Kentucky	United States	Louisville
Chandigarh International Airport	Chandigarh	India	Chandigarh
Dallas/Fort Worth International Airport	Texas	United States	Fort Worth
Indira GandhiInternational Airport	Delhi	India	Delhi
Chhatrapati Shivaji International Airport	Maharashtra	India	Mumbai
San Francisco International Airport	California	United States	San Francisco
Frankfurt Airport	Hesse	Germany	Frankfurt
George Bush Intercontinental Airport	Texas	United States	Houston
John F. Kennedy International Airport	New York	United States	New York City
Tampa International Airport	Florida	United States	Tampa

-- Inserting Table: AIRLINE--

CREATE TABLE AIRLINE
(AIRLINEID VARCHAR(3) NOT NULL,
AL_NAME VARCHAR2(50),
THREE_DIGIT_CODE VARCHAR(3),
PRIMARY KEY(AIRLINEID));

-- Inserting values for Table: AIRLINE --

INSERT INTO AIRLINE (AIRLINEID, AL_NAME, THREE_DIGIT_CODE) VALUES('AA','American Airlines','001');
INSERT INTO AIRLINE (AIRLINEID, AL_NAME, THREE_DIGIT_CODE) VALUES('AI','Air India Limited','098');
INSERT INTO AIRLINE (AIRLINEID, AL_NAME, THREE_DIGIT_CODE) VALUES('LH','Lufthansa', '220');
INSERT INTO AIRLINE (AIRLINEID, AL_NAME, THREE_DIGIT_CODE) VALUES('BA','British Airways','125');
INSERT INTO AIRLINE (AIRLINEID, AL_NAME, THREE_DIGIT_CODE) VALUES('QR','Qatar Airways','157');
INSERT INTO AIRLINE (AIRLINEID, AL_NAME, THREE_DIGIT_CODE) VALUES('9W','Jet Airways','589');
INSERT INTO AIRLINE (AIRLINEID, AL_NAME, THREE_DIGIT_CODE) VALUES('EK','Emirates','176');
INSERT INTO AIRLINE (AIRLINEID, AL_NAME, THREE_DIGIT_CODE) VALUES('EY','Ethiad Airways','607');

AIRLINEID	AL_NAME	THREE_DIGIT_CODE
AA	American Airlines	001
AI	Air India Limited	098
LH	Lufthansa	220
BA	British Airways	125
QR	Qatar Airways	157
9W	Jet Airways	589
EK	Emirates	176
EY	Ethiad Airways	607

-- Inserting Table: CONTAINS--
CREATE TABLE CONTAINS
(AIRLINEID VARCHAR(3) NOT NULL,
AP_NAME VARCHAR2(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);

-- Inserting values into Table: CONTAINS--

INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('AA','Louisville International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('AA','John F. Kennedy International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('AA','George Bush Intercontinental Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('AA','San Francisco International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('AA','Tampa International Airport');

INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('AI','Chandigarh International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('AI','Dallas/Fort Worth International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('AI','Indira GandhiInternational Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('AI','Chhatrapati Shivaji International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('AI','George Bush Intercontinental Airport');

INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('LH','Chhatrapati Shivaji International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('LH','Frankfurt Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('LH','John F. Kennedy International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('LH','San Francisco International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('LH','Dallas/Fort Worth International Airport');

INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('BA','John F. Kennedy International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('BA','Chhatrapati Shivaji International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('BA','Chandigarh International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('BA','Frankfurt Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('BA','San Francisco International Airport');

INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('QR','Chhatrapati Shivaji International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('QR','Dallas/Fort Worth International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('QR','John F. Kennedy International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('QR','Tampa International Airport');
INSERT INTO CONTAINS (AIRLINEID, AP_NAME) VALUES('QR','Louisville International Airport');

-- Inserting Table: FLIGHT--
CREATE TABLE FLIGHT
(FLIGHT_CODE VARCHAR(10) NOT NULL,
SOURCE VARCHAR(3),
DESTINATION VARCHAR(3),
ARRIVAL VARCHAR2(10),
DEPARTURE VARCHAR2(10),

STATUS VARCHAR(10),
DURATION VARCHAR2(30),
FLIGHTTYPE VARCHAR(10),
LAYOVER_TIME VARCHAR2(30),
NO_OF_STOPS INT,
AIRLINEID VARCHAR(3),
PRIMARY KEY(FLIGHT_CODE),
FOREIGN KEY(AIRLINEID) REFERENCES AIRLINE(AIRLINEID) ON DELETE CASCADE);

-- Inserting values into Table: FLIGHT—

INSERT INTO FLIGHT(FLIGHT_CODE, SOURCE, DESTINATION, ARRIVAL, DEPARTURE, STATUS, DURATION, FLIGHTTYPE, LAYOVER_TIME, NO_OF_STOPS, AIRLINEID)
VALUES('AI2014','BOM','DFW','02:10','03:15','On-time','24hr','Connecting',3,1,'AI');

INSERT INTO FLIGHT(FLIGHT_CODE, SOURCE, DESTINATION, ARRIVAL, DEPARTURE, STATUS, DURATION, FLIGHTTYPE, LAYOVER_TIME, NO_OF_STOPS, AIRLINEID)
VALUES('QR2305','BOM','DFW','13:00','13:55','Delayed','21hr','Non-stop',0,0,'QR');

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 FLIGHT(FLIGHT_CODE, SOURCE, DESTINATION, ARRIVAL, DEPARTURE, STATUS, DURATION, FLIGHTTYPE, LAYOVER_TIME, NO_OF_STOPS, AIRLINEID)
VALUES('LH9876','JFK','BOM','05:50','06:35','On-time','18hrs','Non-stop',0,0,'LH');

INSERT INTO FLIGHT(FLIGHT_CODE, SOURCE, DESTINATION, ARRIVAL, DEPARTURE, STATUS, DURATION, FLIGHTTYPE, LAYOVER_TIME, NO_OF_STOPS, AIRLINEID)
VALUES('BA1689','FRA','DEL','10:20','10:55','On-time','14hrs','Non-stop',0,0,'BA');

INSERT INTO FLIGHT(FLIGHT_CODE, SOURCE, DESTINATION, ARRIVAL, DEPARTURE, STATUS, DURATION, FLIGHTTYPE, LAYOVER_TIME, NO_OF_STOPS, AIRLINEID)
VALUES('AA4367','SFO','FRA','18:10','18:55','On-time','21hrs','Non-stop',0,0,'AA');

INSERT INTO FLIGHT(FLIGHT_CODE, SOURCE, DESTINATION, ARRIVAL, DEPARTURE, STATUS, DURATION, FLIGHTTYPE, LAYOVER_TIME, NO_OF_STOPS, AIRLINEID)
VALUES('QR1902','IXC','IAH','22:00','22:50','Delayed','28hrs','Non-stop',5,1,'QR');

INSERT INTO FLIGHT(FLIGHT_CODE, SOURCE, DESTINATION, ARRIVAL, DEPARTURE, STATUS, DURATION, FLIGHTTYPE, LAYOVER_TIME, NO_OF_STOPS, AIRLINEID)

VALUES('BA3056','BOM','DFW','02:15','02:55','On-time','29hrs','Connecting',3,1,'BA');

INSERT INTO FLIGHT(FLIGHT_CODE, SOURCE, DESTINATION, ARRIVAL, DEPARTURE, STATUS, DURATION, FLIGHTTYPE, LAYOVER_TIME, NO_OF_STOPS, AIRLINEID)
VALUES('EK3456','BOM','SFO','18:50','19:40','On-time','30hrs','Non-stop',0,0,'EK');

INSERT INTO FLIGHT(FLIGHT_CODE, SOURCE, DESTINATION, ARRIVAL, DEPARTURE, STATUS, DURATION, FLIGHTTYPE, LAYOVER_TIME, NO_OF_STOPS, AIRLINEID)
VALUES('9W2334','IAH','DEL','23:00','13:45','On-time','23hrs','Direct',0,0,'9W');

-- Inserting Table: PASSENGER1--

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

-- Inserting values in table: PASSENGER1--
INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(1,'A1234568');
INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(2,'B9876541');
INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(3,'C2345698');
INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(4,'D1002004');
INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(5,'X9324666');
INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(6,'B8765430');
INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(7,'J9801235');
INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(8,'A1122334');
INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(9,'Q1243567');
INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(10,'S1243269');
INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(11,'E3277889');
INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(12,'K3212322');
INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(13,'P3452390');
INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(14,'W7543336');
INSERT INTO PASSENGER1(PID, PASSPORTNO) VALUES(15,'R8990566');

-- Inserting Table: PASSENGER2--

CREATE TABLE PASSENGER2
(PASSPORTNO VARCHAR(10) NOT NULL,
FNAME VARCHAR2(20),
M VARCHAR(1),
LNAME VARCHAR2(20),
ADDRESS VARCHAR2(100),
PHONE INT,

```
AGE INT,
SEX VARCHAR(1),
PRIMARY KEY(PASSPORTNO));
```

--Inserting VALUES IN TABLE: PASSENGER2--
```
INSERT INTO PASSENGER2(PASSPORTNO,FNAME,M,LNAME,ADDRESS,PHONE,AGE,SEX)
VALUES('A1234568','ALEN','M','SMITH','2230 NORTHSIDE, APT 11, ALBANY, NY',8080367290,30,'M');

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 PASSENGER2(PASSPORTNO,FNAME,M,LNAME,ADDRESS,PHONE,AGE,SEX)
VALUES('C2345698','KHYATI','A','MISHRA','7820 MCCALLUM COURTS, APT 234, AKRON,
OH',8082267280,30,'F');

INSERT INTO PASSENGER2(PASSPORTNO,FNAME,M,LNAME,ADDRESS,PHONE,AGE,SEX)
VALUES('D1002004','ANKITA','S','PATIL','7720 MCCALLUM BLVD, APT 1082, DALLAS,
TX',9080367266,23,'F');

INSERT INTO PASSENGER2(PASSPORTNO,FNAME,M,LNAME,ADDRESS,PHONE,AGE,SEX)
VALUES('X9324666','TEJASHREE','B','PANDIT','9082 ESTAES OF RICHARDSON, RICHARDSON,
TX',9004360125,28,'F');

INSERT INTO PASSENGER2(PASSPORTNO,FNAME,M,LNAME,ADDRESS,PHONE,AGE,SEX)
VALUES('B8765430','LAKSHMI','P','SHARMA','1110 FIR HILLS, APT 903, AKRON, OH',7666190505,30,'F');

INSERT INTO PASSENGER2(PASSPORTNO,FNAME,M,LNAME,ADDRESS,PHONE,AGE,SEX)
VALUES('J9801235','AKHILESH','D','JOSHI','345 CHATHAM COURTS, APT 678, MUMBAI,
INDIA',9080369290,29,'M');

INSERT INTO PASSENGER2(PASSPORTNO,FNAME,M,LNAME,ADDRESS,PHONE,AGE,SEX)
VALUES('A1122334','MANAN','S','LAKHANI','5589 CHTHAM REFLECTIONS, APT 349 HOUSTON,
TX',9004335126,25,'F');

INSERT INTO PASSENGER2(PASSPORTNO,FNAME,M,LNAME,ADDRESS,PHONE,AGE,SEX)
VALUES('Q1243567','KARAN','M','MOTANI','4444 FRANKFORD VILLA, APT 77, GUILDERLAND,
NY',9727626643,22,'M');

INSERT INTO PASSENGER2(PASSPORTNO,FNAME,M,LNAME,ADDRESS,PHONE,AGE,SEX)
VALUES('S1243269','ROM','A','SOLANKI','7720 MCCALLUM BLVD, APT 2087, DALLAS,
TX',9004568903,60,'M');

INSERT INTO PASSENGER2(PASSPORTNO,FNAME,M,LNAME,ADDRESS,PHONE,AGE,SEX)
VALUES('E3277889','John','A','GATES','1234 BAKER APTS, APT 59, HESSE,
GERMANY',9724569986,10,'M');
```

```
INSERT INTO PASSENGER2(PASSPORTNO,FNAME,M,LNAME,ADDRESS,PHONE,AGE,SEX)
VALUES('K3212322','SARA','B','GOMES','6785 SPLITSVILLA, APT 34, MIAMI, FL',9024569226,15,'F');

INSERT INTO PASSENGER2(PASSPORTNO,FNAME,M,LNAME,ADDRESS,PHONE,AGE,SEX)
VALUES('P3452390','ALIA','V','BHAT','548 MARKET PLACE, SAN Francisco, CA',9734567800,10,'F');

INSERT INTO PASSENGER2(PASSPORTNO,FNAME,M,LNAME,ADDRESS,PHONE,AGE,SEX)
VALUES('W7543336','JOHN','P','SMITH','6666 ROCK HILL, APT 2902, TAMPA, FL',4624569986,55,'M');

INSERT INTO PASSENGER2(PASSPORTNO,FNAME,M,LNAME,ADDRESS,PHONE,AGE,SEX)
VALUES('R8990566','RIA','T','GUPTA','3355 PALENCIA, APT 2065, MUMBAI, INDIA',4724512343,10,'M');
```

-- Inserting Table: PASSENGER3--

```
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);
```

-- Inserting values into Table: PASSENGER3--

```
INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(1,'AI2014');
INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(2,'LH9876');
INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(3,'9W2334');
INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(4,'QR1902');
INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(5,'EY1234');
INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(6,'BA3056');
INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(7,'9W2334');
INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(8,'AA4367');
INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(9,'QR1902');
INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(10,'EK3456');
INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(11,'BA1689');
INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(12,'QR1902');
INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(13,'AI2014');
INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(14,'BA1689');
INSERT INTO PASSENGER3(PID, FLIGHT_CODE) VALUES(15,'QR2305');
```

-- Inserting Table: EMPLOYEE1—

```
CREATE TABLE EMPLOYEE1
(SSN INT NOT NULL,
FNAME VARCHAR2(20),
M VARCHAR(1),
LNAME VARCHAR2(20),
```

```sql
ADDRESS VARCHAR2(100),
PHONE INT,
AGE INT,
SEX VARCHAR(1),
JOBTYPE VARCHAR2(30),
ASTYPE VARCHAR2(30),
ETYPE VARCHAR2(30),
SHIFT VARCHAR2(20),
POSITION VARCHAR2(30),
AP_NAME VARCHAR2(100),
PRIMARY KEY(SSN),
FOREIGN KEY(AP_NAME) REFERENCES AIRPORT(AP_NAME) ON DELETE CASCADE);
```

-- Implementing Business Rule Using Check Constraint--
AGE OF AN EMPLOYEE WORKING FOR AN AIRPORT SHOULD NOT BE GREATER THAN 65--

```sql
ALTER TABLE EMPLOYEE1
ADD CONSTRAINT AGE_LIMIT CHECK(AGE < 65);
```

-- Example Of Violation Of Check Constraint--
```sql
INSERT INTO EMPLOYEE1(SSN, FNAME, M, LNAME, ADDRESS, PHONE, AGE, SEX, JOBTYPE, ASTYPE,
ETYPE, SHIFT, POSITION, AP_NAME)
VALUES(123456799,'RAM','M','SHARMA','731 HILL TOWN, ARLINGTON, TX',4356789365, 66,
'M','ADMINISTRATIVE SUPPORT','RECEPTIONIST','','','','Louisville International Airport');
```

-- Inserting values in table: EMPLOYEE1 --
```sql
INSERT INTO EMPLOYEE1(SSN, FNAME, M, LNAME, ADDRESS, PHONE, AGE, SEX, JOBTYPE, ASTYPE,
ETYPE, SHIFT, POSITION, AP_NAME)
VALUES(123456789,'LINDA','M','GOODMAN','731 Fondren, Houston, TX',4356789345, 35,
'F','ADMINISTRATIVE SUPPORT','RECEPTIONIST','','','','Louisville International Airport');

INSERT INTO EMPLOYEE1(SSN, FNAME, M, LNAME, ADDRESS, PHONE, AGE, SEX, JOBTYPE, ASTYPE,
ETYPE, SHIFT, POSITION, AP_NAME)
VALUES(333445555,'JOHNY','N','PAUL','638 Voss, Houston, TX',9834561995, 40, 'M','ADMINISTRATIVE
SUPPORT','SECRETARY','','','','Louisville International Airport');

INSERT INTO EMPLOYEE1(SSN, FNAME, M, LNAME, ADDRESS, PHONE, AGE, SEX, JOBTYPE, ASTYPE,
ETYPE, SHIFT, POSITION, AP_NAME)
VALUES(999887777,'JAMES','P','BOND','3321 Castle, Spring, TX',9834666995, 50,
'M','ENGINEER','','RADIO ENGINEER','','','Louisville International Airport');

INSERT INTO EMPLOYEE1(SSN, FNAME, M, LNAME, ADDRESS, PHONE, AGE, SEX, JOBTYPE, ASTYPE,
ETYPE, SHIFT, POSITION, AP_NAME)
VALUES(987654321,'SHERLOCK','A','HOLMES','123 TOP HILL, SAN Francisco,CA',8089654321, 47,
'M','TRAFFIC MONITOR','','','DAY','','San Francisco International Airport');
```

```
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 EMPLOYEE1(SSN, FNAME, M, LNAME, ADDRESS, PHONE, AGE, SEX, JOBTYPE, ASTYPE,
ETYPE, SHIFT, POSITION, AP_NAME)
VALUES(453453453,'RAJ','B','SHARMA','345 FLOYDS, MUMBAI,INDIA',4326789031, 35, 'M','AIRPORT
AUTHORITY','','','','MANAGER','Chhatrapati Shivaji International Airport');

INSERT INTO EMPLOYEE1(SSN, FNAME, M, LNAME, ADDRESS, PHONE, AGE, SEX, JOBTYPE, ASTYPE,
ETYPE, SHIFT, POSITION, AP_NAME)
VALUES(987987987,'NIKITA','C','PAUL','110 SYNERGY PARK, DALLAS,TX',5678904325, 33,
'F','ENGINEER','','AIRPORT CIVIL ENGINEER','','','Dallas/Fort Worth International Airport');

INSERT INTO EMPLOYEE1(SSN, FNAME, M, LNAME, ADDRESS, PHONE, AGE, SEX, JOBTYPE, ASTYPE,
ETYPE, SHIFT, POSITION, AP_NAME)
VALUES(888665555,'SHUBHAM','R','GUPTA','567 CHANDANI CHOWK, DELHI, INDIA',8566778890, 39,
'M','ADMINISTRATIVE SUPPORT','DATA ENTRY WORKER','','','','Indira GandhiInternational Airport');

INSERT INTO EMPLOYEE1(SSN, FNAME, M, LNAME, ADDRESS, PHONE, AGE, SEX, JOBTYPE, ASTYPE,
ETYPE, SHIFT, POSITION, AP_NAME)
VALUES(125478909,'PRATIK','T','GOMES','334 VITRUVIAN PARK, ALBANY, NY',4444678903, 56,
'M','TRAFFIC MONITOR','','DAY','','','John F. Kennedy International Airport');

INSERT INTO EMPLOYEE1(SSN, FNAME, M, LNAME, ADDRESS, PHONE, AGE, SEX, JOBTYPE, ASTYPE,
ETYPE, SHIFT, POSITION, AP_NAME)
VALUES(324567897,'ADIT','P','DESAI','987 SOMNATH, CHANDIGARH, INDIA',2244658909, 36,
'M','TRAFFIC MONITOR','','DAY','','','Chandigarh International Airport');
```

-- Inserting Table: EMPLOYEE2 --

```
CREATE TABLE EMPLOYEE2
(JOBTYPE VARCHAR2(30) NOT NULL,
SALARY INT,
PRIMARY KEY(JOBTYPE));
```

--INSERTING VALUES INTO TABLE: EMPLOYEE2 --
```
INSERT INTO EMPLOYEE2(JOBTYPE, SALARY)VALUES('ADMINISTRATIVE SUPPORT',50000);
INSERT INTO EMPLOYEE2(JOBTYPE, SALARY)VALUES('ENGINEER',70000);
INSERT INTO EMPLOYEE2(JOBTYPE, SALARY)VALUES('TRAFFIC MONITOR',80000);
INSERT INTO EMPLOYEE2(JOBTYPE, SALARY)VALUES('AIRPORT AUTHORITY',90000);
```

-- Inserting Table: SERVES --

```sql
CREATE TABLE SERVES
(SSN INT NOT NULL,
PID INT NOT NULL,
PASSPORTNO VARCHAR(10) NOT NULL,
PRIMARY KEY(SSN, PID, PASSPORTNO),
FOREIGN KEY(SSN) REFERENCES EMPLOYEE1(SSN) ON DELETE CASCADE,
FOREIGN KEY(PID, PASSPORTNO) REFERENCES PASSENGER1(PID, PASSPORTNO) ON DELETE CASCADE);
```

-- INSERTING VALUES INTO TABLE: SERVES --

```sql
INSERT INTO SERVES(SSN, PID, PASSPORTNO) VALUES(123456789,1,'A1234568');
INSERT INTO SERVES(SSN, PID, PASSPORTNO) VALUES(123456789,15,'R8990566');
INSERT INTO SERVES(SSN, PID, PASSPORTNO) VALUES(123456789,9,'Q1243567');
INSERT INTO SERVES(SSN, PID, PASSPORTNO) VALUES(888665555,4,'D1002004');
INSERT INTO SERVES(SSN, PID, PASSPORTNO) VALUES(888665555,13,'P3452390');
INSERT INTO SERVES(SSN, PID, PASSPORTNO) VALUES(333445555,10,'S1243269');
INSERT INTO SERVES(SSN, PID, PASSPORTNO) VALUES(333445555,12,'K3212322');
INSERT INTO SERVES(SSN, PID, PASSPORTNO) VALUES(888665555,12,'K3212322');
INSERT INTO SERVES(SSN, PID, PASSPORTNO) VALUES(123456789,7,'J9801235');
INSERT INTO SERVES(SSN, PID, PASSPORTNO) VALUES(888665555,7,'J9801235');
```

-- Inserting Table: TICKET1 --

```sql
CREATE TABLE TICKET1
(TICKET_NUMBER VARCHAR(13) NOT NULL,
SOURCE VARCHAR(3),
DESTINATION VARCHAR(3),
DATE_OF_BOOKING DATE,
DATE_OF_TRAVEL DATE,
SEATNO VARCHAR(5),
CLASS VARCHAR2(15),
DATE_OF_CANCELLATION DATE,
PID INT,
PASSPORTNO VARCHAR(10),
FOREIGN KEY(PID, PASSPORTNO) REFERENCES PASSENGER1(PID, PASSPORTNO) ON DELETE CASCADE);
```

-- Adding CHECK constraint on an attribute TICKET_NUMBER --
```sql
ALTER TABLE TICKET1
ADD CONSTRAINT TICKET_NO_LENGTH CHECK(LENGTH(TICKET_NUMBER)=13);
```

-- Checking Violation Of A Constraint--

```sql
INSERT INTO TICKET1(TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING,
DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO)
VALUES(00112341111221,'BOM','DFW','11-MAY-16','','15-DEC-16','32A','ECONOMY',1,'A1234568');
```

-- Inserting values into Table: TICKET1--

--INSERTING INTO TABLE: TICKET1--
INSERT INTO TICKET1(TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING, DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO) VALUES(0011234111122,'BOM','DFW','11-MAY-16','','15-DEC-16','32A','ECONOMY',1,'A1234568');

INSERT INTO TICKET1(TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING, DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO) VALUES(0984567222299,'JFK','BOM','11-JUN-16','10-DEC-16','20-DEC-16','45D','ECONOMY',2,'B9876541');

INSERT INTO TICKET1(TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING, DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO) VALUES(1768901333273,'IAH','DEL','21-AUG-16','','25-DEC-16','1A','BUSINESS',3,'C2345698');

INSERT INTO TICKET1(TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING, DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO) VALUES(5890987441464,'IXC','IAH','10-AUG-16','','12-JAN-17','20C','FIRST-CLASS',4,'D1002004');

INSERT INTO TICKET1(TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING, DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO) VALUES(1577654664266,'JFK','TPA','13-JUN-16','','10-DEC-16','54E','ECONOMY',5,'X9324666');

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 TICKET1(TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING, DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO) VALUES(7064321779737,'IAH','DEL','15-NOV-16','','25-DEC-16','27B','FIRST-CLASS',7,'J9801235');

INSERT INTO TICKET1(TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING, DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO) VALUES(1571357215116,'SFO','FRA','15-OCT-16','','18-DEC-16','34E','ECONOMY',8,'A1122334');

INSERT INTO TICKET1(TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING, DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO) VALUES(1570864987655,'IXC','IAH','12-NOV-16','','30-DEC-16','54C','ECONOMY',9,'Q1243567');

INSERT INTO TICKET1(TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING, DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO) VALUES(1579283997799,'BOM','SFO','22-JAN-16','','15-DEC-16','38A','ECONOMY',10,'S1243269');

INSERT INTO TICKET1(TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING, DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO) VALUES(1255701876107,'FRA','DEL','19-OCT-16','','31-DEC-16','57F','ECONOMY',11,'E3277889');

```
INSERT INTO TICKET1(TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING,
DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO)
VALUES(1251334499699,'IXC','IAH','20-NOV-16','','12-JAN-17','45D','ECONOMY',12,'K3212322');

INSERT INTO TICKET1(TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING,
DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO)
VALUES(1258776199490,'BOM','DFW','13-MAY-16','25-MAY-16','15-DEC-
16','37C','ECONOMY',13,'P3452390');

INSERT INTO TICKET1(TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING,
DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO)
VALUES(5891155114477,'FRA','DEL','26-JUN-16','','23-DEC-16','55C','ECONOMY',14,'W7543336');

INSERT INTO TICKET1(TICKET_NUMBER, SOURCE, DESTINATION, DATE_OF_BOOKING,
DATE_OF_CANCELLATION, DATE_OF_TRAVEL, SEATNO, CLASS, PID, PASSPORTNO)
VALUES(5893069766787,'BOM','DFW','11-AUG-16','','22-DEC-16','33F','ECONOMY',15,'R8990566');
```

-- Inserting Table: TICKET2--

```
CREATE TABLE TICKET2
(DATE_OF_BOOKING DATE NOT NULL,
SOURCE VARCHAR(3) NOT NULL,
DESTINATION VARCHAR(3) NOT NULL,
CLASS VARCHAR2(15) NOT NULL,
PRICE INT,
PRIMARY KEY(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS));
```

-- Inserting Values into: TICKET2 --

```
INSERT INTO TICKET2(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE)
VALUES('11-MAY-16','BOM','DFW','ECONOMY',95000);

INSERT INTO TICKET2(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE)
VALUES('11-JUN-16','JFK','BOM','ECONOMY',100000);

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

INSERT INTO TICKET2(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE)
VALUES('10-AUG-16','IXC','IAH','FIRST-CLASS',150000);

INSERT INTO TICKET2(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE)
VALUES('13-JUN-16','JFK','TPA','ECONOMY',98000);

INSERT INTO TICKET2(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE)
VALUES('11-NOV-16','BOM','DFW','ECONOMY',125000);
```

```sql
INSERT INTO TICKET2(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE)
VALUES('15-NOV-16','IAH','DEL','FIRST-CLASS',195000);

INSERT INTO TICKET2(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE)
VALUES('15-OCT-16','SFO','FRA','ECONOMY',170000);

INSERT INTO TICKET2(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE)
VALUES('12-NOV-16','IXC','IAH','ECONOMY',140000);

INSERT INTO TICKET2(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE)
VALUES('22-JAN-16','BOM','SFO','ECONOMY',45000);

INSERT INTO TICKET2(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE)
VALUES('19-OCT-16','FRA','DEL','ECONOMY',100000);

INSERT INTO TICKET2(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE)
VALUES('20-NOV-16','IXC','IAH','ECONOMY',120000);

INSERT INTO TICKET2(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE)
VALUES('13-MAY-16','BOM','DFW','ECONOMY',65000);

INSERT INTO TICKET2(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE)
VALUES('26-JUN-16','FRA','DEL','ECONOMY',80000);

INSERT INTO TICKET2(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS, PRICE)
VALUES('11-AUG-16','BOM','DFW','ECONOMY',98000);
```

-- Inserting Table: TICKET3 --

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

-- INSERTING VALUES INTO TABLE: TICKET3 --

```sql
INSERT INTO TICKET3(DATE_OF_CANCELLATION, SURCHARGE) VALUES('10-DEC-16',75000);
INSERT INTO TICKET3(DATE_OF_CANCELLATION, SURCHARGE) VALUES('25-MAY-16',25000);
```

Contains Table

AIRLINEID	AP_NAME
AA	George Bush Intercontinental Airport
AA	John F. Kennedy International Airport
AA	Louisville International Airport
AA	San Francisco International Airport
AA	Tampa International Airport
AI	Chandigarh International Airport
AI	Chhatrapati Shivaji International Airport
AI	Dallas/Fort Worth International Airport
AI	George Bush Intercontinental Airport
AI	Indira GandhiInternational Airport
BA	Chandigarh International Airport
BA	Chhatrapati Shivaji International Airport
BA	Frankfurt Airport

Flight Table

FLIGHT_CODE	SOURCE	DESTINATION	ARRIVAL	DEPARTURE	STATUS	DURATION	FLIGHTTYPE	LAYOVER_TIME	NO_OF_STOPS	AIRLINEID
AI2014	BOM	DFW	02:10	03:15	On-time	24hr	Connecting	3	1	AI
QR2305	BOM	DFW	13:00	13:55	Delayed	21hr	Non-stop	0	0	QR
EY1234	JFK	TPA	19:20	20:05	On-time	16hrs	Connecting	5	2	EY
LH9876	JFK	BOM	05:50	06:35	On-time	18hrs	Non-stop	0	0	LH
BA1689	FRA	DEL	10:20	10:55	On-time	14hrs	Non-stop	0	0	BA
AA4367	SFO	FRA	18:10	18:55	On-time	21hrs	Non-stop	0	0	AA
QR1902	IXC	IAH	22:00	22:50	Delayed	28hrs	Non-stop	5	1	QR
BA3056	BOM	DFW	02:15	02:55	On-time	29hrs	Connecting	3	1	BA
EK3456	BOM	SFO	18:50	19:40	On-time	30hrs	Non-stop	0	0	EK
9W2334	IAH	DEL	23:00	13:45	On-time	23hrs	Direct	0	0	9W

Passenger1 Table

PID	PASSPORTNO
1	A1234568
2	B9876541
3	C2345698
4	D1002004
5	X9324666
6	B8765430
7	J9801235
8	A1122334
9	Q1243567
10	S1243269
11	E3277889
12	K3212322

Passenger2 Table

PASSPORTNO	FNAME	M	LNAME	ADDRESS	PHONE	AGE	SEX
A1234568	ALEN	M	SMITH	2230 NORTHSIDE, APT 11, ALBANY, NY	8080367290	30	M
B9876541	ANKITA	V	AHIR	3456 VIKAS APTS, APT 102,DOMBIVLI, INDIA	8080367280	26	F
C2345698	KHYATI	A	MISHRA	7820 MCCALLUM COURTS, APT 234, AKRON, OH	8082267280	30	F
D1002004	ANKITA	S	PATIL	7720 MCCALLUM BLVD, APT 1082, DALLAS, TX	9080367266	23	F
X9324666	TEJASHREE	B	PANDIT	9082 ESTAES OF RICHARDSON, RICHARDSON, TX	9004360125	28	F
B8765430	LAKSHMI	P	SHARMA	1110 FIR HILLS, APT 903, AKRON, OH	7666190505	30	F
J9801235	AKHILESH	D	JOSHI	345 CHATHAM COURTS, APT 678, MUMBAI, INDIA	9080369290	29	M
A1122334	MANAN	S	LAKHANI	5589 CHTHAM REFLECTIONS, APT 349 HOUSTON, TX	9004335126	25	F
Q1243567	KARAN	M	MOTANI	4444 FRANKFORD VILLA, APT 77, GUILDERLAND, NY	9727626643	22	M
S1243269	ROM	A	SOLANKI	7720 MCCALLUM BLVD, APT 2087, DALLAS, TX	9004568903	60	M
E3277889	John	A	GATES	1234 BAKER APTS, APT 59, HESSE, GERMANY	9724569986	10	M
K3212322	SARA	B	GOMES	6785 SPLITSVILLA, APT 34, MIAMI, FL	9024569226	15	F
P3452390	ALIA	V	BHAT	548 MARKET PLACE, SAN Francisco, CA	9734567800	10	F

Passenger3 Table:

PID	FLIGHT_CODE
1	AI2014
2	LH9876
3	9W2334
4	QR1902
5	EY1234
6	BA3056
7	9W2334
8	AA4367
9	QR1902
10	EK3456
11	BA1689
12	QR1902
13	AI2014

Employee1 Table:

SSN	FNAME	M	LNAME	ADDRESS	PHONE	AGE	SEX	JOBTYPE	ASTYPE	ETYPE	SHIFT	POSITION	AP_NAME
123456789	LINDA	M	GOODMAN	731 Fondren, Houston, TX	4356789345	35	F	ADMINISTRATIVE SUPPORT	RECEPTIONIST	–	–	–	Louisville International Airport
333445555	JOHNY	N	PAUL	638 Voss, Houston, TX	9834561995	40	M	ADMINISTRATIVE SUPPORT	SECRETARY	–	–	–	Louisville International Airport
999887777	JAMES	P	BOND	3321 Castle, Spring, TX	9834666995	50	M	ENGINEER	–	RADIO ENGINEER	–	–	Louisville International Airport
987654321	SHERLOCK	A	HOLMES	123 TOP HILL, SAN Francisco,CA	8089654321	47	M	TRAFFIC MONITOR	–	–	DAY	–	San Francisco International Airport
666884444	SHELDON	A	COOPER	345 CHERRY PARK, HESSE,GERMANY	1254678903	55	M	TRAFFIC MONITOR	–	NIGHT	–	–	Frankfurt Airport

Employee2 Table:

JOBTYPE	SALARY
ADMINISTRATIVE SUPPORT	50000
ENGINEER	70000
TRAFFIC MONITOR	80000
AIRPORT AUTHORITY	90000

Serves Table:

SSN	PID	PASSPORTNO
123456789	1	A1234568
123456789	7	J9801235
123456789	9	Q1243567
123456789	15	R8990566
333445555	10	S1243269
333445555	12	K3212322
888665555	4	D1002004
888665555	7	J9801235
888665555	12	K3212322
888665555	13	P3452390

Ticket1 Table:

TICKET_NUMBER	SOURCE	DESTINATION	DATE_OF_BOOKING	DATE_OF_TRAVEL	SEATNO	CLASS	DATE_OF_CANCELLATION	PID	PASSPORTNO
11234111122	BOM	DFW	11-MAY-16	15-DEC-16	32A	ECONOMY	-	1	A1234568
984567222299	JFK	BOM	11-JUN-16	20-DEC-16	45D	ECONOMY	10-DEC-16	2	B9876541
1768901333273	IAH	DEL	21-AUG-16	25-DEC-16	1A	BUSINESS	-	3	C2345698
5890987441464	IXC	IAH	10-AUG-16	12-JAN-17	20C	FIRST-CLASS	-	4	D1002004
1577654664266	JFK	TPA	13-JUN-16	10-DEC-16	54E	ECONOMY	-	5	X9324666
2206543545545	BOM	DFW	11-NOV-16	12-FEB-17	43B	ECONOMY	-	6	B8765430
7064321779737	IAH	DEL	15-NOV-16	25-DEC-16	27B	FIRST-CLASS	-	7	J9801235
1571357215116	SFO	FRA	15-OCT-16	18-DEC-16	34E	ECONOMY	-	8	A1122334
1570864987655	IXC	IAH	12-NOV-16	30-DEC-16	54C	ECONOMY	-	9	Q1243567
1579283997799	BOM	SFO	22-JAN-16	15-DEC-16	38A	ECONOMY	-	10	S1243269
1255701876107	FRA	DEL	19-OCT-16	31-DEC-16	57F	ECONOMY	-	11	E3277889
1251334499699	IXC	IAH	20-NOV-16	12-JAN-17	45D	ECONOMY	-	12	K3212322
1258776199490	BOM	DFW	13-MAY-16	15-DEC-16	37C	ECONOMY	25-MAY-16	13	P3452390

Ticket2 Table:

DATE_OF_BOOKING	SOURCE	DESTINATION	CLASS	PRICE
11-MAY-16	BOM	DFW	ECONOMY	95000
11-JUN-16	JFK	BOM	ECONOMY	100000
21-AUG-16	IAH	DEL	BUSINESS	200000
10-AUG-16	IXC	IAH	FIRST-CLASS	150000
13-JUN-16	JFK	TPA	ECONOMY	98000
11-NOV-16	BOM	DFW	ECONOMY	125000
15-NOV-16	IAH	DEL	FIRST-CLASS	195000
15-OCT-16	SFO	FRA	ECONOMY	170000
12-NOV-16	IXC	IAH	ECONOMY	140000
22-JAN-16	BOM	SFO	ECONOMY	45000
19-OCT-16	FRA	DEL	ECONOMY	100000
20-NOV-16	IXC	IAH	ECONOMY	120000
13-MAY-16	BOM	DFW	ECONOMY	65000

Ticket3 Table:

DATE_OF_CANCELLATION	SURCHARGE
10–DEC–16	75000
25–MAY–16	25000

Delayed Flight Table:

FLIGHT_CODE	DESTINATION	SOURCE	AIRLINEID	REPORT_TIME
AI127	DFW	BOM	AI	28–APR–24

Ticket_Price_History Table:

DATE_OF_BOOKING	SOURCE	DESTINATION	CLASS	PRICE
11–NOV–16	BOM	DFW	ECONOMY	150000

9. STORED PROCEDURE

9.1 For details of economy class passengers with destination 'DFW'

```
CREATE OR REPLACE PROCEDURE DFWECONOMYPASSENGERS AS
CURSOR ECOPASSDETAILS is
select
al.AL_NAME,fl.FLIGHT_CODE,p2.FNAME,p2.LNAME,p2.PASSPORTNO,t.CLASS,t.DATE_OF_TRAVEL,t.DESTI
NATION,t.SOURCE,t.SEATNO,t.TICKET_NUMBER from Airline al,Flight fl,PASSENGER1 p1,PASSENGER2 p2
,PASSENGER3 p3,TICKET1 t
where al.AIRLINEID = fl.AIRLINEID
and  p1.PID= p3.PID
and  p1.PASSPORTNO =p2.PASSPORTNO
and fl.FLIGHT_CODE = p3.FLIGHT_CODE
and t.PASSPORTNO = p2.PASSPORTNO
and t.CLASS='ECONOMY' and t.DESTINATION='DFW';

PASSDETAILS ECOPASSDETAILS%rowtype;

BEGIN

Open ECOPASSDETAILS ;
   LOOP
    fetch ECOPASSDETAILS into PASSDETAILS;
     EXIT WHEN ECOPASSDETAILS%NOTFOUND;
        dbms_output.put_line (PASSDETAILS.AL_NAME || ' ' || PASSDETAILS.FLIGHT_CODE || ' ' ||
        PASSDETAILS.FNAME || ' ' || PASSDETAILS.LNAME|| ' ' ||PASSDETAILS.PASSPORTNO || ' ' ||
        PASSDETAILS.CLASS || ' ' || PASSDETAILS.SOURCE || ' ' || PASSDETAILS.SEATNO || ' ' ||
        PASSDETAILS.TICKET_NUMBER);

    END LOOP;
 close ECOPASSDETAILS;
 END DFWECONOMYPASSENGERS;
```

9.2 Stored Procedure for flight details by status

```
CREATE OR REPLACE PROCEDURE FLIGHTSBYSTATUS
(IN_STATUS IN VARCHAR2) AS

CURSOR fSTATUS is
SELECT  DISTINCT F.FLIGHT_CODE ,AL.AL_NAME ,F.ARRIVAL,F.DEPARTURE,
F.SOURCE,F.DESTINATION,F.STATUS,F.FLIGHTTYPE
FROM AIRLINE AL,AIRPORT AP, FLIGHT F
WHERE AL.AIRLINEID=F.AIRLINEID
AND   F.STATUS =IN_STATUS;

FlightStatus fSTATUS%rowtype;

BEGIN
  Open fSTATUS ;
   LOOP
    fetch fSTATUS into FlightStatus;
     EXIT WHEN fSTATUS%NOTFOUND;
    DBMS_OUTPUT.PUT_LINE (FlightStatus.FLIGHT_CODE || ' ' || FlightStatus.AL_NAME || ' ' ||
FlightStatus.ARRIVAL || ' ' || FlightStatus.departure|| ' ' ||FlightStatus.Source || ' ' ||
FlightStatus.DESTINATION || ' ' || FlightStatus.STATUS || ' ' || FlightStatus.FLIGHTTYPE);

    END LOOP;
     CLOSE fSTATUS;
END FLIGHTSBYSTATUS;

 --Testing in sql developer: Oracle db--
SET SERVEROUTPUT ON
exec FLIGHTSBYSTATUS('Delayed');
-- or--
SET SERVEROUTPUT ON
exec FLIGHTSBYSTATUS('On-time');
```

10.   TRIGGERS

10.1   Trigger for, when a flight is delayed, it is logged into different tables.

```
CREATE OR REPLACE TRIGGER DELAYEDFLIGHTS
AFTER INSERT ON FLIGHT
FOR EACH ROW
DECLARE

BEGIN
        if :new.STATUS = 'Delayed'
        then
        insert into delayed_flights (FLIGHT_CODE, SOURCE, DESTINATION ,
        AIRLINEID,report_time)
        values(:new.flight_code,:new.source,:new.destination,:new.airlineid,sy
        sdate);
        end if;
        END;
--This is audit table for this trigger
CREATE TABLE "DELAYED_FLIGHTS"
        (       "FLIGHT_CODE" VARCHAR2(20 BYTE),        "DESTINATION"
        VARCHAR2(20 BYTE),        "SOURCE" VARCHAR2(20 BYTE),
        "AIRLINEID" VARCHAR2(20 BYTE),        "REPORT_TIME" DATE
        );
NSERT INTO FLIGHT(FLIGHT_CODE, SOURCE, DESTINATION, ARRIVAL, DEPARTURE,
STATUS, DURATION, FLIGHTTYPE, LAYOVER_TIME, NO_OF_STOPS, AIRLINEID)
VALUES('AI127','BOM','DFW','02:10','03:15','Delayed','24hr','Connecting',3,1,'AI');
```

10.2　　　Trigger to update TICKET_PRICE_HISTORY table when the price of the air ticket is updated in TICKET 2 table.

-- CREATING TABLE TICKET_PRICE_HISTORY--

```
CREATE TABLE TICKET_PRICE_HISTORY
(DATE_OF_BOOKING DATE NOT NULL,
SOURCE VARCHAR(3) NOT NULL,
DESTINATION VARCHAR(3) NOT NULL,
CLASS VARCHAR2(15) NOT NULL,
PRICE INT,
PRIMARY KEY(DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS));
```

-- CREATE A TRIGGER TICKET_PRICE_HISTORY --

```
  CREATE OR REPLACE TRIGGER UPDATEDSalary
  BEFORE INSERT OR UPDATE OF SALARY ON EMPLOYEE2
  FOR EACH ROW
  DECLARE
    JOBTYPE EMPLOYEE2.JOBTYPE%TYPE;
  BEGIN
    JOBTYPE := :new.JOBTYPE;
    CASE JOBTYPE
      WHEN 'Administrative Support' THEN
        :new.SALARY := :new.SALARY + (:new.SALARY * 0.10);
      WHEN 'ENGINEER' THEN
        :new.SALARY := :new.SALARY + (:new.SALARY * 0.05);
      WHEN 'TRAFFIC MONITOR' THEN
        :new.SALARY := :new.SALARY + (:new.SALARY * 0.25);
      WHEN 'AIRPORT AUTHORITY' THEN
        :new.SALARY := :new.SALARY + (:new.SALARY * 0.45);
    END CASE;
  END;
--Trigger to update 'TICKET_PRICE_HISTORY' table when the price of an air ticket is updated in
TICKET2 table –
CREATE OR REPLACE TRIGGER TICKET_PRICE_HISTORY
BEFORE UPDATE OF PRICE ON TICKET2
FOR EACH ROW
BEGIN
  INSERT INTO TICKET_PRICE_HISTORY (DATE_OF_BOOKING, SOURCE, DESTINATION, CLASS,
PRICE)
  VALUES (:OLD.DATE_OF_BOOKING, :OLD.SOURCE, :OLD.DESTINATION, :OLD.CLASS,
:OLD.PRICE);
EXCEPTION
  WHEN OTHERS THEN
    -- Handle exceptions here, e.g., log the error
    NULL;
END;
```

```
--Let's update the price or fare of an air ticket –
UPDATE TICKET2
SET PRICE = 150000
WHERE
 DATE_OF_BOOKING = DATE '2016-11-11'
AND
 SOURCE = 'BOM'
AND DESTINATION = 'DFW'
AND CLASS = 'ECONOMY';
```

CONCLUSION

In conclusion, I can state with confidence that working on this DBMS project as a student was a worthwhile learning experience. I learned more about database architecture and maintenance, as well as the value of data integrity and security, thanks to this project. I was able to use the project to apply the principles I had learned in class to a practical issue, which improved my problem-solving and practical skills. Additionally, having my classmates on a team allowed us to communicate and exchange ideas, which enhanced the quality of our final project. I now have a thorough grasp of DBMS and how it is used in Airport Management System thanks to this assignment.