भारतीय सूचना प्रौद्योगिकी संस्थान, भोपाल

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY, BHOPAL

(An Autonomous Institute Of National Importance under act of Parliament)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

PROJECT FILE

AIRLINES DATABASE MANAGEMENT SYSTEM

Project By

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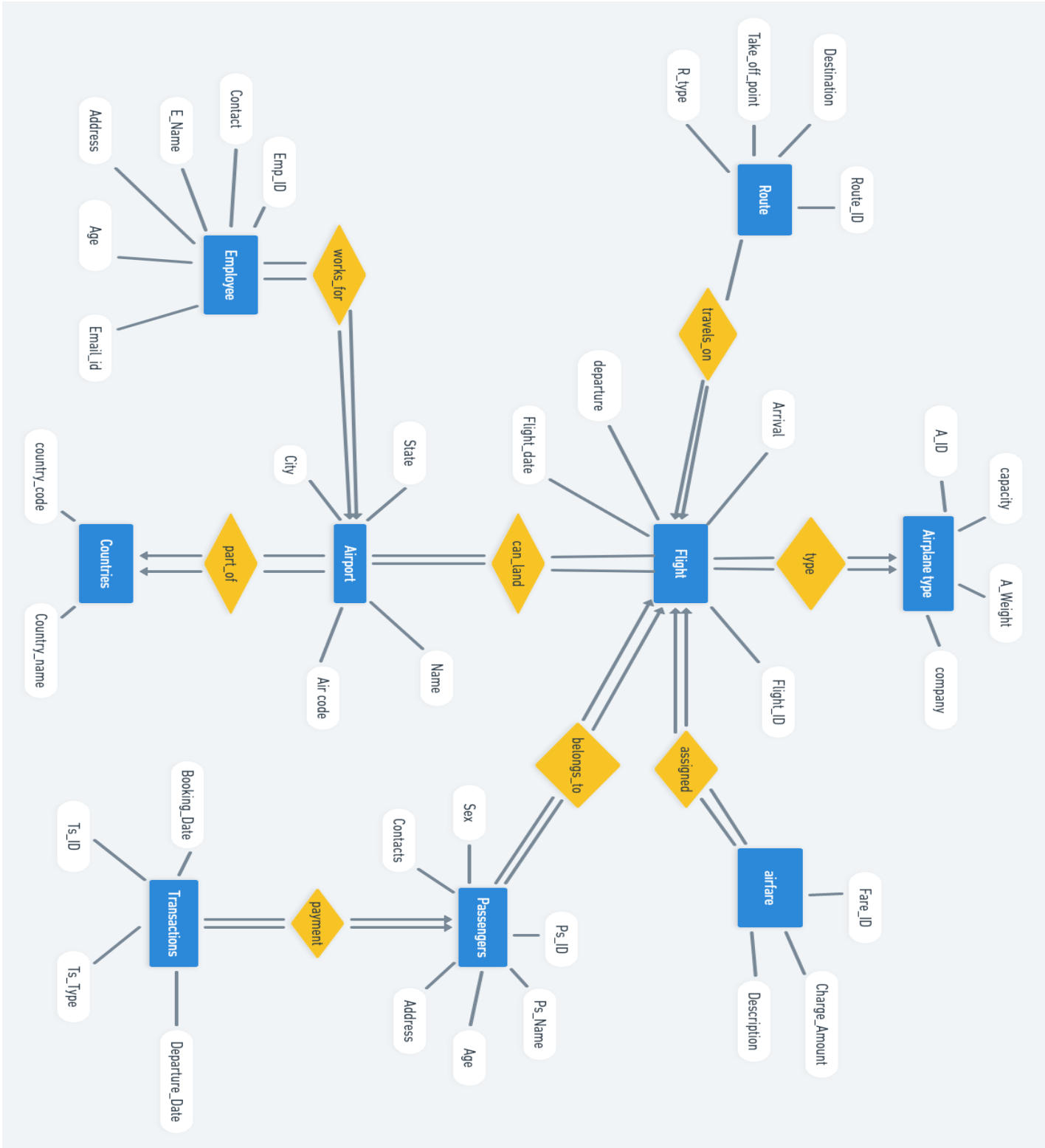Vinayak Chatterjee (20U01026)

Akshay Rahangdale (20U01038)

Description:

This project aims to manage the data for an airline company. This database holds flight details, flight schedule, passenger details and ticket records with the help of SQL.

Schema:

➢ Airplane_type(A_ID, Capacity, A_weight, Company)
➢ Route (Route_ID, Destination,Take_Off_point,R_type)
➢ Flight (Flight_ID, Departure, Arrival, Flight_date,)
➢ AirFare (Fare_ID, Charge_Amount, Description)
➢ Passengers (Ps_ID, Name, Address, Age, Sex, Contacts)
➢ Employees (Emp_ID, Name, Address ,Age, Email_ID, Contacts)
➢ Transactions(TS_ID, Booking_Date, Departure_Date,Type,Emp_ID*,Ps_ID*, Flight_ID*, Charge_Amount*)
➢ Countries(Country_code, Country_Name)
➢ Airport(Air_Code, Air_Name, City, State)

Entity Relationship Diagram:

Relational Model:

- Airplane_type (<u>A_ID</u>, Capacity, A_weight, Company)
-
- Route (<u>Route_ID</u>, Destination,Take_Off_point,R_type)
-
- Flight (<u>Flight_ID</u>, Departure, Arrival, Flight_date, A_ID*)
-
- AirFare (<u>Fare_ID</u>, Charge_Amount, Description, Flight_ID*)
-
- Passengers (<u>Ps_ID</u>, Name, Address, Age, Sex, Contacts, Flight_ID*)

- Employees (<u>Emp_ID,</u> Name, Address ,Age, Email_ID, Contacts, Air_Code*)

- Transactions (<u>TS_ID</u> , Booking_Date, Departure_Date, Type, Emp_ID*, Ps_ID*, Flight_ID*, Charge_Amount*)

- Countries (Country_code, Country_Name)

- Airport (Air_Code, Air_Name, City, State, Country_code*)

- Can_Land (Air_Code*, Flight_ID*)

- Travels_on (Route_ID*, Flight_ID*)

Create Table:

```sql
CREATE TABLE Airplane_type(
    A_ID INT,
    Capacity INT,
    A_weight INT,
    Company VARCHAR(15),
    PRIMARY KEY(A_ID)
);
 CREATE TABLE Route(
    Route_ID INT,
    Take_Off_point VARCHAR(15),
    Destination VARCHAR(15),
    R_type VARCHAR(15),
    PRIMARY KEY(Route_ID)
);
CREATE TABLE Flight(
    Flight_ID VARCHAR(15),
    Departure VARCHAR(30),
    Arrival VARCHAR(30),
    Flight_date DATE,
    A_ID INT,
    PRIMARY KEY(Flight_ID),
    FOREIGN KEY (A_ID) REFERENCES Airplane_type(A_ID)
);

CREATE TABLE AirFare(
    Fare_ID INT,
    Charge_Amount INT,
    Description VARCHAR(25),
    Flight_ID VARCHAR(15),
    PRIMARY KEY(Fare_ID),
    FOREIGN KEY (Flight_ID) REFERENCES Flight(Flight_ID)
);

CREATE TABLE Passengers(
    Ps_ID INT,
    Ps_Name VARCHAR(20),
    Address VARCHAR(50),
    Age INT,
    Sex VARCHAR(1),
    Contacts VARCHAR(10),
    Flight_ID VARCHAR(15),
    PRIMARY KEY(Ps_ID),
    FOREIGN KEY (Flight_ID) REFERENCES Flight(Flight_ID)
);
```

```sql
CREATE TABLE Countries(
    Country_code INT,
    Country_Name VARCHAR(20),
    PRIMARY KEY(Country_code)
);
CREATE TABLE Airport(
    Air_code VARCHAR(10),
    Air_Name VARCHAR(50),
    City VARCHAR(20),
    State VARCHAR(20),
    Country_code INT,
    PRIMARY KEY(Air_code),
    FOREIGN KEY (Country_code) REFERENCES Countries(Country_code)
);

CREATE TABLE Employees(
    Emp_ID INT,
    E_Name VARCHAR(20),
    Address VARCHAR(50),
    Age INT,
    Email_ID VARCHAR(20),
    Contact VARCHAR(20),
    Air_code VARCHAR(10),
    PRIMARY KEY(Emp_ID),
    FOREIGN KEY (Air_code) REFERENCES Airport(Air_code)
);

CREATE TABLE Can_Land(
    Air_code VARCHAR(10),
    Flight_ID VARCHAR(15),
    PRIMARY KEY(Air_code,Flight_ID),
    FOREIGN KEY(Air_code) REFERENCES Airport(Air_code),
    FOREIGN KEY(Flight_ID) REFERENCES Flight(Flight_ID)
);
```

```sql
CREATE TABLE Transactions(
    TS_ID INT,
    Booking_Date DATE,
    Departure_Date DATE,
    TS_Type VARCHAR(20),
    Emp_ID INT,
    Ps_ID INT,
    Flight_ID VARCHAR(15),
    Charge_Amount INT,
    PRIMARY KEY(TS_ID),
    FOREIGN KEY (Emp_ID) REFERENCES Employees(Emp_ID) ,
    FOREIGN KEY (Ps_ID) REFERENCES Passengers(Ps_ID),
    FOREIGN KEY (Flight_ID) REFERENCES Flight(Flight_ID),
    FOREIGN KEY (Charge_Amount) REFERENCES AirFare(Fare_ID)
);

CREATE TABLE Travels_on(
    Route_ID INT,
    Flight_ID VARCHAR(15),
    PRIMARY KEY(Route_ID,Flight_ID),
    FOREIGN KEY(Route_ID) REFERENCES Route(Route_ID),
    FOREIGN KEY(Flight_ID) REFERENCES Flight(Flight_ID)
);
```

Insert Data:

```sql
INSERT INTO Airplane_type VALUES (738,853,394,'Indigo');
INSERT INTO Airplane_type VALUES (777,800,380,'Vistara');
INSERT INTO Airplane_type VALUES (750,790,364,'AirIndia');
INSERT INTO Airplane_type VALUES (790,850,390,'SpiceJet');
INSERT INTO Airplane_type VALUES (745,770,405,'GoAir');
INSERT INTO Airplane_type VALUES (768,867,387,'AirAsia');
INSERT INTO Airplane_type VALUES (821,790,355,'TruJet');
INSERT INTO Airplane_type VALUES (785,835,410,'Alliance Air');
```

```sql
INSERT INTO Route VALUES(168806,'London','Delhi','Direct');
INSERT INTO Route VALUES(157306,'NewJersey','Mumbai','2Hr Break');
INSERT INTO Route VALUES(178916,'Washington','Jodhpur','3Hr Break');
INSERT INTO Route VALUES(324567,'Chennai','Denmark','Direct');
INSERT INTO Route VALUES(452368,'Chandigard','NewYork','3Hr Break');
INSERT INTO Route VALUES(894521,'Daman','Delhi','Direct');
INSERT INTO Route VALUES(578425,'Beijing','Punjab','Direct');
INSERT INTO Route VALUES(421523,'Hyderabad','Jammu & Kashmir','Direct');
```

```sql
INSERT INTO Flight VALUES('AI2014','2021-01-12 08:45am','2021-01-12
10:25pm','2021-01-12',738);
INSERT INTO Flight VALUES('QR2305','2020-12-26 12:05pm','2020-12-27
12:25pm','2020-12-26',777);
INSERT INTO Flight VALUES('EY1234','2021-02-10 05:00am','2021-02-10
10;30pm','2021-02-10',750);
INSERT INTO Flight VALUES('LH9876','2021-02-25 10:15am','2021-02-25
11:00pm','2021-02-25',790);
INSERT INTO Flight VALUES('BA1689','2021-03-02 2:15am','2021-03-02
10:00pm','2021-03-02',745);
INSERT INTO Flight VALUES('AA4367','2021-03-25 12:05am','2021-03-25
02:15am','2021-03-25',768);
INSERT INTO Flight VALUES('CT7812','2021-04-04 2:15pm','2021-04-04
8:00pm','2021-04-04',821);
```

```sql
INSERT INTO Flight VALUES('PF4521','2020-12-25 5:00pm','2020-12-25
10:30pm','2020-12-25',785);
INSERT INTO AirFare VALUES(1,27341,'Standard Single','AI2014');
INSERT INTO AirFare VALUES(4,34837,'Standard Return','QR2305');
INSERT INTO AirFare VALUES(2,42176,'Key Fare Single','EY1234');
INSERT INTO AirFare VALUES(3,27373,'Business Return','LH9876');
INSERT INTO AirFare VALUES(6,44592,'Advanced Purchase','BA1689');
INSERT INTO AirFare VALUES(5,8777,'Superpex Return','AA4367');
INSERT INTO AirFare VALUES(7,9578,'Standard Return','CT7812');
INSERT INTO AirFare VALUES(8,4459,'Superpex Return','PF4521');
```

```sql
INSERT INTO Passengers VALUES(1,'Steve Smith','2230 Northside,Apt
11,London',30,'M','8080367290','AI2014');
INSERT INTO Passengers VALUES(2,'Ankita Ahir','3456 Vikas Apts,Apt 102,New
Jersey',26,'F','8080367280','QR2305');
INSERT INTO Passengers VALUES(4,'Akhilesh Joshi','345 Chatam courts,Apt
678,Chennai',29,'M','9080369290','EY1234');
INSERT INTO Passengers VALUES(3,'Khyati Mishra','7820 Mccallum courts,Apt
234,Washington',30,'F','8082267280','LH9876');
INSERT INTO Passengers VALUES(5,'Rom Solanki','1234 Baker Apts,Apt
208,Chandigard',60,'M','9004568903','EY1234');
INSERT INTO Passengers VALUES(6,'Lakshmi Sharma','1110 Fir hills,Apt
90,Daman',30,'F','7666190505','AA4367');
INSERT INTO Passengers VALUES(8,'Manan Lakhani','7720 Mccallum Blvd,Apt
77,Beijing',45,'M','8124579635','CT7812');
INSERT INTO Passengers VALUES(7,'Ria Gupta','B-402,Aditya
Apt,Hyderabad',34,'F','9819414036','EY1234');
```

```sql
INSERT INTO Countries VALUES (+44,'England');
INSERT INTO Countries VALUES (+1,'USA');
INSERT INTO Countries VALUES (+91,'India');
INSERT INTO Countries VALUES (+45,'Kingdom of Denmark');
INSERT INTO Countries VALUES (+64,'New Zealand');
INSERT INTO Countries VALUES (+971,'UAE');
INSERT INTO Countries VALUES (+213,'Algeria');
INSERT INTO Countries VALUES (+55,'Brazil');
```

```sql
INSERT INTO Airport VALUES('DEL','Indira Gandhi International
Airport','Delhi','UP',+91);
INSERT INTO Airport VALUES('BOM','Chhatrapati Shivaji Maharaj International
Airport','Mumbai','Maharashtra',+91);
INSERT INTO Airport VALUES('LCY','London City Airport','Newham','London',+44);
INSERT INTO Airport VALUES('EWR','Newark Liberty International Airport','Newark','New
Jersey',+1);
INSERT INTO Airport VALUES('JFK','John F.Kennnedy International Airport','New York
City','New York',+1);
INSERT INTO Airport VALUES('CPH','Copenhagen Airport','Copenhagen','Denmark',+45);
INSERT INTO Airport VALUES('AIP','Adampur Airport','Jalandhar','Punjab',+91);
INSERT INTO Airport VALUES('IXJ','Satwari Airport','Jammu','Jammu & Kashmir',+91);
```

```sql
INSERT INTO Employees VALUES(1234,'Rekha Tiwary','202-Meeta Apt,Yogi Nagar,Mumbai'
,30,'rekha1234@gmail.com','+918530324018','DEL');

INSERT INTO Employees VALUES(3246,'John Dsouza','302-Fountain Apt,ElizaBeth Street,
Newham',26,'john2346@gmail.com','+447911123456','BOM');

INSERT INTO Employees VALUES(9321,'Sanjay Rathod','62-Patwa Apt,Pradeep Nagar,
Delhi',36,'sanjay78@gmail.com','+917504681201','LCY');

INSERT INTO Employees VALUES(8512,'Hafsa Iqmar','1023-Prajwal Apt,Newark',41,
'hafsa964@gmail.com','6465554468','EWR');

INSERT INTO Employees VALUES(7512,'Akshay Sharma','Akshay Villa,Queens
Street,Copenhagen',20,'akshay27@gmail.com','+45886443210','JFK');

INSERT INTO Employees VALUES(5123,'Lara Jen','28-Mark road,Victoria street,New York
City',31,'jenlara4@gmail.com','+448000751234','CPH');

INSERT INTO Employees VALUES(2458,'Johny Paul','45-Balaji Apt,Ajit
Nagar,Jalandar',32,'johnypaul8@gmail.com','+919785425154','AIP');

INSERT INTO Employees VALUES(4521,'Nidhi Maroliya','6-Matruchaya Apt,Park Road,
Jammu',31,'nidhi785@gmail.com','+918211954901','IXJ');
```

```sql
INSERT INTO Can_Land VALUES('DEL','AI2014');
INSERT INTO Can_Land VALUES('BOM','QR2305');
INSERT INTO Can_Land VALUES('LCY','EY1234');
INSERT INTO Can_Land VALUES('EWR','LH9876');
INSERT INTO Can_Land VALUES('JFK','BA1689');
INSERT INTO Can_Land VALUES('CPH','AA4367');
INSERT INTO Can_Land VALUES('AIP','CT7812');
INSERT INTO Can_Land VALUES('IXJ','PF4521');
```

```sql
INSERT INTO Transactions VALUES(12345678,'2021-02-21','2021-02-22','Google
Pay',1234,1,'AI2014',27341);
INSERT INTO Transactions VALUES(45612789,'2021-01-12','2021-01-14','Credit
Card',3246,2,'QR2305',34837);
INSERT INTO Transactions
VALUES(56987123,'2020-12-05','2020-12-02','Paytm',9321,4,'EY1234',42176);
INSERT INTO Transactions
VALUES(45321879,'2021-03-15','2021-03-16','PhonePe',8512,3,'LH9876',27373);
INSERT INTO Transactions
VALUES(75145863,'2021-04-22','2021-04-25','Paytm',7512,5,'EY1234',44592);
INSERT INTO Transactions
VALUES(17892455,'2021-02-05','2021-02-08','Paytm',5123,6,'AA4367',8777);
INSERT INTO Transactions
VALUES(24517852,'2021-03-06','2021-03-08','PhonePe',2458,8,'CT7812',9578);
INSERT INTO Transactions VALUES(32548525,'2021-01-20','2021-01-25','Credit
Card',4521,7,'EY1234',4459);
```

```sql
INSERT INTO Travels_on VALUES(168806,'AI2014');
INSERT INTO Travels_on VALUES(157306,'QR2305');
INSERT INTO Travels_on VALUES(178916,'EY1234');
INSERT INTO Travels_on VALUES(324567,'LH9876');
INSERT INTO Travels_on VALUES(452368,'BA1689');
INSERT INTO Travels_on VALUES(894521,'AA4367');
INSERT INTO Travels_on VALUES(578425,'CT7812');
INSERT INTO Travels_on VALUES(421523,'PF4521');
```

Tables:

A_ID	Capacity	A_weight	Company
738	853	394	Indigo
745	770	405	GoAir
750	790	364	AirIndia
768	867	387	AirAsia
777	800	380	Vistara
785	835	410	Alliance Air
790	850	390	SpiceJet
821	790	355	TruJet
NULL	NULL	NULL	NULL

Route_ID	Take_Off_point	Destination	R_type
157306	NewJersey	Mumbai	2Hr Break
168806	London	Delhi	Direct
178916	Washington	Jodhpur	3Hr Break
324567	Chennai	Denmark	Direct
421523	Hyderabad	Jammu & Kashmir	Direct
452368	Hyderabad	NewYork	3Hr Break
578425	Beijing	Punjab	Direct
894521	Daman	Delhi	Direct
NULL	NULL	NULL	NULL

Flight_ID	Departure	Arrival	Flight_date	A_ID
AA4367	2021-03-25 12:05am	2021-03-25 02:15am	2021-03-25	768
AI2014	2021-01-12 08:45am	2021-01-12 10:25pm	2021-01-12	738
BA1689	2021-03-02 2:15am	2021-03-02 10:00pm	2021-03-02	745
CT7812	2021-04-04 2:15pm	2021-04-04 8:00pm	2021-04-04	821
EY1234	2021-02-10 05:00am	2021-02-10 10;30pm	2021-02-10	750
LH9876	2021-02-25 10:15am	2021-02-25 11:00pm	2021-02-25	790
PF4521	2020-12-25 5:00pm	2020-12-25 10:30pm	2020-12-25	785
QR2305	2020-12-26 12:05pm	2020-12-27 12:25pm	2020-12-26	777
NULL	NULL	NULL	NULL	NULL

Fare_ID	Charge_Amount	Description	Flight_ID
1	27341	Standard Single	AI2014
2	42176	Key Fare Single	EY1234
3	27373	Business Return	LH9876
4	34837	Standard Return	QR2305
5	8777	Superpex Return	AA4367
6	44592	Advanced Purchase	BA1689
7	9578	Standard Return	CT7812
8	4459	Superpex Return	PF4521
NULL	NULL	NULL	NULL

Ps_ID	Ps_Name	Address	Age	Sex	Contacts	Flight_ID
1	Steve Smith	2230 Northside,Apt 11,London	30	M	8080367290	AI2014
2	Ankita Ahir	3456 Vikas Apts,Apt 102,New Jersey	26	F	8080367280	QR2305
3	Khya Khyati Mishra	20 Mccallum courts,Apt 234,Washington	30	F	8082267280	LH9876
4	Akhilesh Joshi	345 Chatam courts,Apt 678,Chennai	29	M	9080369290	EY1234
5	Rom Solanki	1234 Baker Apts,Apt 208,Chandigard	60	M	9004568903	EY1234
6	Lakshmi Sharma	1110 Fir hills,Apt 90,Daman	30	F	7666190505	AA4367
7	Ria Gupta	B-402,Aditya Apt,Hyderabad	34	F	9819414036	EY1234
8	Manan Lakhani	7720 Mccallum Blvd,Apt 77,Beijing	45	M	8124579635	CT7812
NULL	NULL	NULL	NULL	NULL	NULL	NULL

Country_code	Country_Name
1	USA
44	England
45	Kingdom of Denmark
55	Brazil
64	New Zealand
91	India
213	Algeria
971	UAE
NULL	NULL

Air_code	Air_Name	City	State	Country_code
AIP	AIP Adampur Airport	Jalandhar	Punjab	91
BOM	Chhatrapati Shivaji Maharaj International Airport	Mumbai	Maharashtra	91
CPH	Copenhagen Airport	Copenhagen	Denmark	45
DEL	Indira Gandhi International Airport	Delhi	UP	91
EWR	Newark Liberty International Airport	Newark	New Jersey	1
IXJ	Satwari Airport	Jammu	Jammu & Kashmir	91
JFK	John F.Kennnedy International Airport	New York City	New York	1
LCY	London City Airport	Newham	London	44
NULL	NULL	NULL	NULL	NULL

Emp_ID	E_Name	Address	Age	Email_ID	Contact	Air_code
1234	Rekha Tiwary	202-Meeta Apt,Yogi Nagar,Mumbai	30	rekha1234@gmail.com	+918530324018	DEL
2458	Johny Paul	45-Balaji Apt,Ajit Nagar,Jalandar	32	johnypaul8@gmail.com	+919785425154	AIP
3246	John Dsouza	302-Fountain Apt,ElizaBeth Street, New...	26	john2346@gmail.com	+447911123456	BOM
4521	Nidhi Maroliya	6-Matruchaya Apt,Park Road, Jammu	31	nidhi785@gmail.com	+918211954901	IXJ
5123	Lara Jen	28-Mark road,Victoria street,New York ...	31	jenlara4@gmail.com	+448000751234	CPH
7512	Akshay Sharma	Akshay Villa,Queens Street,Copenhagen	20	akshay27@gmail.com	+45886443210	JFK
8512	Hafsa Iqmar	1023-Prajwal Apt,Newark	41	hafsa964@gmail.com	6465554468	EWR
9321	Sanjay Rathod	62-Patwa Apt,Pradeep Nagar, Delhi	36	sanjay78@gmail.com	+917504681201	LCY
NULL	NULL	NULL	NULL	NULL	NULL	NULL

Air_code	Flight_ID
CPH	AA4367
DEL	AI2014
JFK	BA1689
AIP	CT7812
LCY	EY1234
EWR	LH9876
IXJ	PF4521
BOM	QR2305
NULL	NULL

Route_ID	Flight_ID
894521	AA4367
168806	AI2014
452368	BA1689
578425	CT7812
178916	EY1234
324567	LH9876
421523	PF4521
157306	QR2305
NULL	NULL

Queries:

1. Display the flight-id and Passenger name travelling by Indigo Company.

    SELECT F.Flight_ID, P.Ps_Name
     FROM Airplane_type as A, Flight as F, Passengers as P
    WHERE A.A_ID = F.A_ID AND
          F.Flight_ID = P.Flight_ID AND
          A.Company = 'Indigo';

Flight_ID	Ps_Name
AI2014	Steve Smith

2. Find the Employee-id of all employees whose name includes the substring John.

    SELECT Emp_ID, E_Name
    FROM Employees
    WHERE E_Name LIKE '%John%';

Emp_ID	E_Name
2458	Johny Paul
3246	John Dsouza

3. Find all country name with more than one airport.

```
SELECT Country_Name, count(*) as Airport_count
  FROM Airport as A,Countries as C
  WHERE A.Country_code = C.Country_code
  GROUP BY C.Country_name
  HAVING count(*) > 1;
```

Country_Name	Airport_count
India	4
USA	2

4. Find the Fare-id of those with Charge-amount between 20000 and 35000.

```
SELECT Fare_ID, Charge_Amount
 FROM AirFare
 WHERE Charge_Amount BETWEEN 20000 AND 35000 ;
```

Fare_ID	Charge_Amount
1	27341
3	27373
4	34837

5. Increase the charge-amount by 5% whose class is Superex Return.

```
UPDATE AirFare
  SET Charge_Amount = Charge_Amount * 1.05
  WHERE Description = 'Superpex Return';
```

Fare_ID	Charge_Amount	Description	Flight_ID
1	27341	Standard Single	AI2014
2	42176	Key Fare Single	EY1234
3	27373	Business Return	LH9876
4	34837	Standard Return	QR2305
5	8777	Superpex Return	AA4367
6	44592	Advanced Purchase	BA1689
7	9578	Standard Return	CT7812
8	4459	Superpex Return	PF4521

Fare_ID	Charge_Amount	Description	Flight_ID
1	27341	Standard Single	AI2014
2	42176	Key Fare Single	EY1234
3	27373	Business Return	LH9876
4	34837	Standard Return	QR2305
5	9216	Superpex Return	AA4367
6	44592	Advanced Purchase	BA1689
7	9578	Standard Return	CT7812
8	4682	Superpex Return	PF4521

6. Display All the counties that may have or may not have the Airport.

SELECT *
FROM Countries NATURAL LEFT OUTER JOIN Airport;

Country_code	Country_Name	Air_code	Air_Name	City	State
1	USA	JFK	John F.Kennnedy International Airport	New York City	New York
1	USA	EWR	Newark Liberty International Airport	Newark	New Jersey
44	England	LCY	London City Airport	Newham	London
45	Kingdom of Denmark	CPH	Copenhagen Airport	Copenhagen	Denmark
55	Brazil	NULL	NULL	NULL	NULL
64	New Zealand	NULL	NULL	NULL	NULL
91	India	IXJ	Satwari Airport	Jammu	Jammu & Kashmi
91	India	DEL	Indira Gandhi International Airport	Delhi	UP
91	India	BOM	Chhatrapati Shivaji Maharaj International Airport	Mumbai	Maharashtra
91	India	AIP	Adampur Airport	Jalandhar	Punjab
213	Algeria	NULL	NULL	NULL	NULL
971	UAE	NULL	NULL	NULL	NULL

7. Display the country-name that does not have an airport.

SELECT Country_code, Country_Name
FROM Countries
WHERE Country_code NOT IN (SELECT Country_code
FROM Airport);

country_code	country_name
55	Brazil
64	New Zealand
213	Algeria
971	UAE

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