

DBMS Mini-Project

Online Airline Reservation System

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1. Aim: -

The Airline Reservation System (ARS) is a software application which aims to assist an airline with transactions related to making ticket reservations, which includes booking, reserving, cancelling and rescheduling tickets. From the viewpoint of the airlines the system provides the following: -

- i. The system should minimize repetitive work done by the system administrator and reservation clerks.
- ii. The system should maintain customer information in case of emergency.
- iii. The system should minimize the number of vacant seats on a flight and maximize flight capacity utilization.
- iv. The system should reduce effort and frustration for travellers in scheduling a trip, especially by reducing the search effort for the flight they need to take.
- v. The system should make it easy for travellers to check the ticket status or make changes to their trip.

2. Need for Online Ticket Reservation: -

The manual system of booking seats is slow and results into booking conflicts, vacant seats in some planes and it is hard to quickly obtain customer information in case of emergency. On the other hand, the online process of airline ticket reservation, booking and airline management minimizes the errors resulting from manual system operations.

3. Entities and Attributes: -

a) Passenger (customer): The person who is booking

- i. **P_ID**
- ii. First_name:
- iii. Last_name
- iv. Passport_no
- v. P_age
- vi. E_mail
- vii. Residence
- viii. Phone_no
- ix. Relative_phone_no

b) Journey Details: Details of journey

- i. **Journey_ID**
- ii. Meal
- iii. Other_info

c) Ticket Details: Details of ticket

- i. **Ticket_no**
- ii. Journey_ID
- iii. Fair
- iv. Class
- v. Status

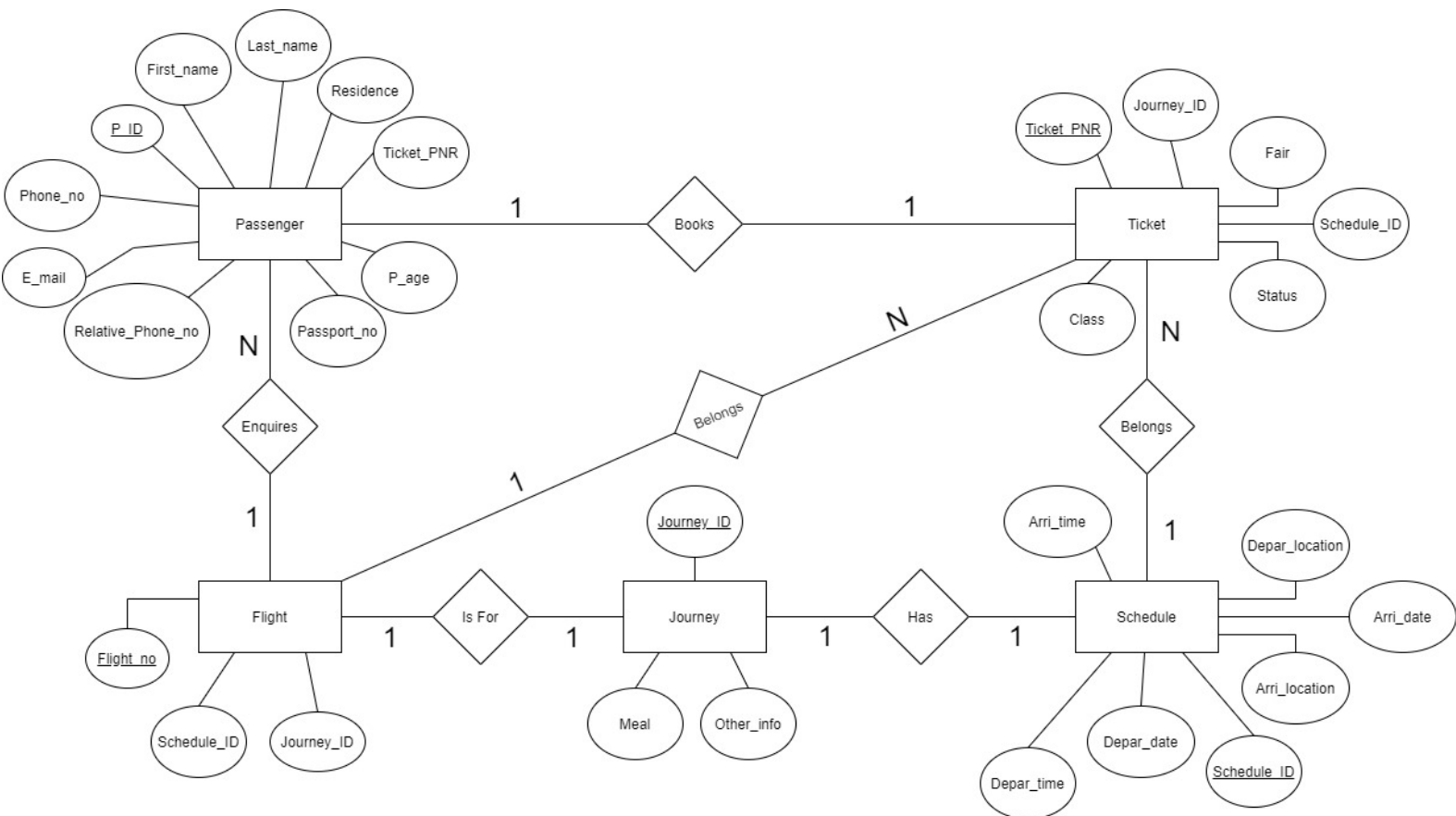
d) Schedule: Details of journey schedule

- i. **Schedule_ID**
- ii. Depar_location
- iii. Arri_location
- iv. Depar_time
- v. Arri_time
- vi. Journey_ID

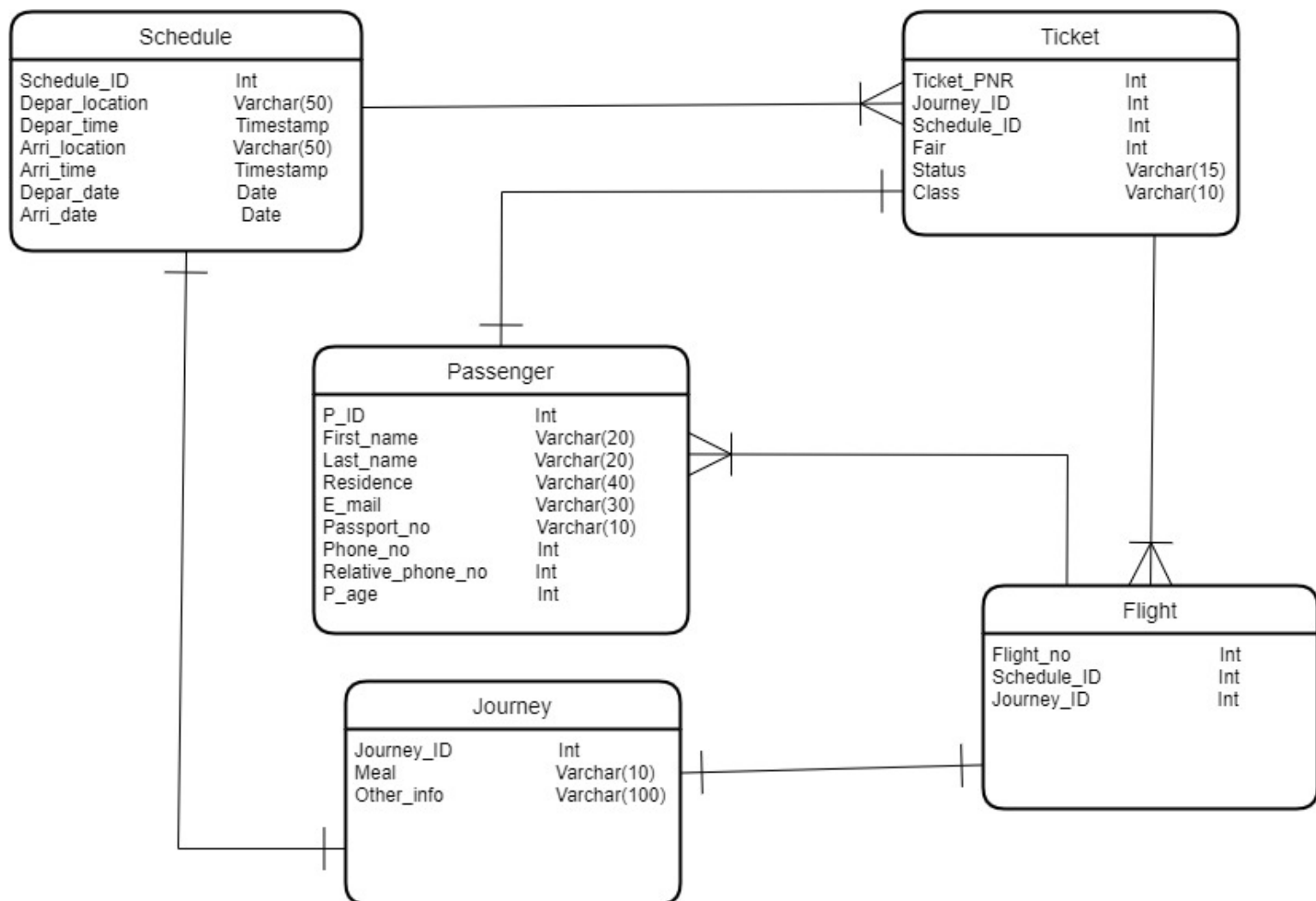
e) Flight Details: Details of flight

- i. **Flight_no**
- ii. Journey_ID
- iii. Schedule_ID

4. ER Diagram: -



5. Relational Schema: -



6. Implementation on SQL Server: -

- Code for creating tables on SQL Server: -

```
Create table passenger
(P_ID numeric(10) not null,
First_Name Varchar(20) not null,
Last_Name Varchar(20) not null,
P_age numeric(3),
Residence Varchar(40) not null,
Phone_no Numeric(10) not null,
Relative_phone_no numeric(10),
Email_Address varchar(20) not null,
Passport_no varchar(10) not null,
```

```

Ticket_PNR varchar(10),
constraint passenger_up unique (passport_no),
constraint passenger_pk primary key (P_ID)
);
Create table Schedule
(
Schedule_Id numeric(10) not null,
Depar_location varchar(50) not null,
Depar_date Date not null,
Depar_time time not null,
Arri_location Varchar(50) not null,
Arri_date date not null,
Arri_time time not null,
constraint schedule_pk primary key (schedule_ID)
);
Create table Journey
(
Journey_Id numeric(10) not null,
Meal varchar(10) not null,
Other_info Varchar(100),
constraint journey_pk primary key (Journey_ID)
);
Create table Ticket
(
Ticket_PNR Varchar(10) not null,
Journey_Id numeric(10) not null,
Schedule_ID numeric(10) not null,
Fair int not null,
Class Varchar(10) not null,
Status Varchar(15) not null,
constraint ticket_pk primary key (ticket_PNR)
);
Create table Flight
(
Flight_no varchar(5) not null,
Schedule_id numeric(10) not null,
Journey_id numeric(10) not null,
constraint Flight_pk primary key (flight_no)
);

```

- Code for Inserting Values into the table: -

```

INSERT INTO Passenger
(P_ID,First_Name,Last_Name,P_age,Residence,Phone_no,Relative_ph
ne_no,Email_Address, Passport_no,Ticket_PNR)
VALUES
(6458972345,'Vaibhav','Rawal',17,'Delhi',5674328896,6314895627,'
vaibhav@gmail.com','D568749125','PNQ001');
INSERT INTO Passenger
(P_ID,First_Name,Last_name,P_age,Residence,Phone_no,Relative_ph
ne_no,Email_Address,Passport_no,Ticket_PNR)
VALUES
(6458972346,'Ram','Sharma',16,'Mumbai',6314895627,2467831435,'ra
m@gmail.com','E364785521','PNQ002');
INSERT INTO Passenger
(P_ID,First_Name,Last_name,P_age,Residence,Phone_no,Relative_ph
ne_no,Email_Address,Passport_no,Ticket_PNR)
VALUES
(6458972347,'Sham','Sharma',30,'Mumbai',2467831596,9875546258,'s
ham@gmail.com','F578942451','PNQ003');
INSERT INTO Passenger
(P_ID,First_Name,Last_name,P_age,Residence,Phone_no,Relative_ph
ne_no,Email_Address,Passport_no,Ticket_PNR)
VALUES
(6458972348,'Raghav','Yadav',35,'Indore',6489521374,9865421374,'
raghav@gmail.com','G246458713','PNQ004');
INSERT INTO Passenger
(P_ID,First_Name,Last_name,P_age,Residence,Phone_no,Relative_ph
ne_no,Email_Address,Passport_no,Ticket_PNR)
VALUES
(6458972349,'Rishab','Mathur',30,'Delhi',9547623815,9658423614,'
rishab@gmail.com','H341578426','PNQ005');

INSERT INTO Schedule (Schedule_Id, Deapar_location, Deapar_date,
Deapar_time, Arri_location, Arri_date, Arri_time)
VALUES (201, 'Delhi', '2021-10-25', '06:30:00', 'Dubai', '2021-
10-25', '9:00:00');
INSERT INTO Schedule (Schedule_Id, Deapar_location, Deapar_date,
Deapar_time, Arri_location, Arri_date, Arri_time)
VALUES (202, 'Dubai', '2021-10-26', '10:30:00', 'Delhi', '2021-
10-25', '12:00:00');
INSERT INTO Schedule (Schedule_Id, Deapar_location, Deapar_date,
Deapar_time, Arri_location, Arri_date, Arri_time)
VALUES (203, 'Delhi', '2021-10-26', '06:30:00', 'New York',
'2021-10-27', '2:00:00');
INSERT INTO Schedule (Schedule_Id, Deapar_location, Deapar_date,
Deapar_time, Arri_location, Arri_date, Arri_time)
VALUES (204, 'New York', '2021-10-28', '12:30:00', 'Delhi',
'2021-10-29', '14:00:00');
INSERT INTO Schedule (Schedule_Id, Deapar_location, Deapar_date,
Deapar_time, Arri_location, Arri_date, Arri_time)

```

```
VALUES (205, 'Delhi', '2021-10-30', '15:30:00', 'Mumbai', '2021-10-30', '17:00:00');
```

```
INSERT INTO Journey (Journey_Id, Meal, Other_info)
```

```
VALUES (513, 'YES', 'Require Wheelchair');
```

```
INSERT INTO Journey (Journey_Id, Meal, Other_info)
```

```
VALUES (514, 'NO', NULL);
```

```
INSERT INTO Journey (Journey_Id, Meal, Other_info)
```

```
VALUES (515, 'YES', 'Require Wheelchair');
```

```
INSERT INTO Journey (Journey_Id, Meal, Other_info)
```

```
VALUES (516, 'NO', 'Require Wheelchair');
```

```
INSERT INTO Journey (Journey_Id, Meal, Other_info)
```

```
VALUES (517, 'YES', NULL);
```

```
INSERT INTO Ticket (Ticket_PNR, Journey_Id, Schedule_ID, Fair, Class, Status)
```

```
VALUES ('PNQ001', 513, 201, 25000, 'ECONOMY', 'CONFIRMED');
```

```
INSERT INTO Ticket (Ticket_PNR, Journey_Id, Schedule_ID, Fair, Class, Status)
```

```
VALUES ('PNQ002', 514, 202, 55000, 'BUSINESS', 'CONFIRMED');
```

```
INSERT INTO Ticket (Ticket_PNR, Journey_Id, Schedule_ID, Fair, Class, Status)
```

```
VALUES ('PNQ003', 513, 203, 85000, 'FIRST', 'CONFIRMED');
```

```
INSERT INTO Ticket (Ticket_PNR, Journey_Id, Schedule_ID, Fair, Class, Status)
```

```
VALUES ('PNQ004', 515, 204, 20000, 'ECONOMY', 'NOT CONFIRMED');
```

```
INSERT INTO Ticket (Ticket_PNR, Journey_Id, Schedule_ID, Fair, Class, Status)
```

```
VALUES ('PNQ005', 517, 205, 25000, 'ECONOMY', 'NOT CONFIRMED');
```

```
INSERT INTO Flight (Flight_no, Schedule_ID, Journey_ID)
```

```
VALUES ('AI407', 201, 513);
```

```
INSERT INTO Flight (Flight_no, Schedule_ID, Journey_ID)
```

```
VALUES ('AI408', 202, 514);
```

```
INSERT INTO Flight (Flight_no, Schedule_ID, Journey_ID)
```

```
VALUES ('AI409', 203, 516);
```

```
INSERT INTO Flight (Flight_no, Schedule_ID, Journey_ID)
```

```
VALUES ('AI410', 202, 517);
```

```
INSERT INTO Flight (Flight_no, Schedule_ID, Journey_ID)
```

```
VALUES ('AI411', 205, 514);
```

```
select * from passenger;
```

```
select * from schedule;
```

```
select * from Ticket;
```

```
select * from Flight;
```

```
select * from Journey;
```

Output: -

Results Messages										
	P_ID	First_Name	Last_Name	P_age	Residence	Phone_no	Relative_phone_no	Email_Address	Passport_no	Ticket_PNR
1	6458972345	Vaibhav	Rawal	17	Delhi	5674328896	6314895627	vaibhav@gmail.com	D568749125	PNQ001
2	6458972346	Ram	Sharma	16	Mumbai	6314895627	2467831435	ram@gmail.com	E364785521	PNQ002
3	6458972347	Sham	Sharma	30	Mumbai	2467831596	9875546258	sham@gmail.com	F578942451	PNQ003
4	6458972348	Raghav	Yadav	35	Indore	6489521374	9865421374	raghav@gmail.com	G246458713	PNQ004
5	6458972349	Rishab	Mathur	30	Delhi	9547623815	9658423614	rishab@gmail.com	H341578426	PNQ005

Results Messages							
	Schedule_Id	Depar_location	Depar_date	Depar_time	Arri_location	Arri_date	Arri_time
1	201	Delhi	2021-10-25	06:30:00.0000000	Dubai	2021-10-25	09:00:00.0000000
2	202	Dubai	2021-10-26	10:30:00.0000000	Delhi	2021-10-25	12:00:00.0000000
3	203	Delhi	2021-10-26	06:30:00.0000000	New York	2021-10-27	02:00:00.0000000
4	204	New York	2021-10-28	12:30:00.0000000	Delhi	2021-10-29	14:00:00.0000000
5	205	Delhi	2021-10-30	15:30:00.0000000	Mumbai	2021-10-30	17:00:00.0000000

Results Messages						
	Ticket_PNR	Journey_Id	Schedule_ID	Fair	Class	Status
1	PNQ001	513	201	25000	ECONOMY	CONFIRMED
2	PNQ002	514	202	55000	BUSINESS	CONFIRMED
3	PNQ003	513	203	85000	FIRST	CONFIRMED
4	PNQ004	515	204	20000	ECONOMY	NOT CONF...
5	PNQ005	517	205	25000	ECONOMY	NOT CONF...

Results Messages			
	Flight_no	Schedule_id	Journey_id
1	AI407	201	513
2	AI408	202	514
3	AI409	203	516
4	AI410	202	517
5	AI411	205	514

Results Messages			
	Journey_Id	Meal	Other_info
1	513	YES	Require Wheelchair
2	514	NO	NULL
3	515	YES	Require Wheelchair
4	516	NO	Require Wheelchair
5	517	YES	NULL

- Queries related to database: -

- Find the information of the passengers who are below 18 years.

```
select * from passenger where p_age < 18;
```

	P_ID	First_Name	Last_Name	P_age	Residence	Phone_no	Relative_phone_no	Email_Address	Passport_no	Ticket_PNR
1	6458972345	Vaibhav	Rawal	17	Delhi	5674328896	6314895627	vaibhav@gmail.com	D568749125	PNQ001
2	6458972346	Ram	Sharma	16	Mumbai	6314895627	2467831435	ram@gmail.com	E364785521	PNQ002

- Find the departure time and date of ticket PNR = PNQ002.

```
select depar_date, depar_time from schedule where
schedule_id=(select schedule_id from ticket where
ticket_PNR='PNQ002');
```

	depar_date	depar_time
1	2021-10-26	10:30:00.0000000

- Find the ticket_pnr whose ticket is not confirmed.

```
select ticket_pnr from ticket where status='NOT
CONFIRMED';
```

	ticket_pnr
1	PNQ004
2	PNQ005

- Show the passenger's name along with the class in which they will travel.

```
select passenger.First_Name as "Passenger Name",
ticket.class as "Class" from ticket inner join passenger
on passenger.Ticket_PNR=ticket.ticket_PNR;
```

	Passenger Name	Class
1	Vaibhav	ECONOMY
2	Ram	BUSINESS
3	Sham	FIRST
4	Raghav	ECONOMY
5	Rishab	ECONOMY

5. Find the name of passenger who bought the costliest ticket.

```
select passenger.First_Name as "Passenger Name" from
passenger inner join ticket on
ticket.ticket_PNR=passenger.Ticket_PNR and
ticket.fair=(select max(fair) from ticket);
```

Results Messages	
	Passenger Name
1	Sham

6. Show name, passport number, class and ticket PNR of all the passengers.

```
select passenger.first_name as "Passenger Name",
passenger.passport_no as "Passport Number", ticket.class
as "Class" ,ticket.Ticket_pnr as "Ticket PNR" from
passenger left join ticket on
Ticket.ticket_pnr=passenger.ticket_pnr order by class;
```

Results Messages				
	Passenger Name	Passport Number	Class	Ticket PNR
1	Ram	E364785521	BUSINESS	PNQ002
2	Raghav	G246458713	ECONOMY	PNQ004
3	Rishab	H341578426	ECONOMY	PNQ005
4	Vaibhav	D568749125	ECONOMY	PNQ001
5	Sham	F578942451	FIRST	PNQ003

7. List the details of customer whose phone number start with 64.

```
select * from passenger where phone_no like '64%';
```

Results Messages										
	P_ID	First_Name	Last_Name	P_age	Residence	Phone_no	Relative_phone_no	Email_Address	Passport_no	Ticket_PNR
1	6458972348	Raghav	Yadav	35	Indore	6489521374	9865421374	raghav@gmail.com	G246458713	PNQ004

8. List the details of customers whose relative's phone number start from 74.

```
select * from passenger where relative_phone_no like
'%74';
```

Results Messages										
	P_ID	First_Name	Last_Name	P_age	Residence	Phone_no	Relative_phone_no	Email_Address	Passport_no	Ticket_PNR
1	6458972348	Raghav	Yadav	35	Indore	6489521374	9865421374	raghav@gmail.com	G246458713	PNQ004

9. Find the Phone number and name of the passenger who is going to Dubai
- ```
select first_name as "Name", phone_no as "Phone Number"
from passenger where ticket_pnr=(select ticket_pnr from
ticket where schedule_id=(select schedule_id from
schedule where arri_location='Dubai'));
```

| Results |         |              | Messages |  |
|---------|---------|--------------|----------|--|
|         | Name    | Phone Number |          |  |
| 1       | Vaibhav | 5674328896   |          |  |

10. Find total number of passengers.

```
select count(P_ID) as "Number of Passengers" from
passenger;
```

| Results |                      | Messages |  |
|---------|----------------------|----------|--|
|         | Number of Passengers |          |  |
| 1       | 5                    |          |  |

11. Find the flight number going to New York.

```
select flight_no from flight where schedule_id=(select
schedule_id from schedule where Arri_location='New
York');
```

| Results |           | Messages |  |
|---------|-----------|----------|--|
|         | flight_no |          |  |
| 1       | AI409     |          |  |

12. Find the Flights coming from Dubai, before 30/10/21.

```
select flight_no from flight where schedule_id=(select
schedule_id from schedule where Depar_location='Dubai'
and depar_date<'2021-10-30');
```

| Results |           | Messages |  |
|---------|-----------|----------|--|
|         | flight_no |          |  |
| 1       | AI408     |          |  |
| 2       | AI410     |          |  |

13. Find the names of customers whose name start with letter 'R' and end with 'B'.

```
select first_name as "Passenger Name" from passenger
where first_name like 'r%B';
```

| Results |  | Messages       |  |
|---------|--|----------------|--|
|         |  | Passenger Name |  |
| 1       |  | Rishab         |  |

14. Find passengers residing in Mumbai.

```
select * from passenger where residence='Mumbai';
```

| Results |            | Messages   |           |       |           |            |                   |                |             |            |
|---------|------------|------------|-----------|-------|-----------|------------|-------------------|----------------|-------------|------------|
|         | P_ID       | First_Name | Last_Name | P_age | Residence | Phone_no   | Relative_phone_no | Email_Address  | Passport_no | Ticket_PNR |
| 1       | 6458972346 | Ram        | Sharma    | 16    | Mumbai    | 6314895627 | 2467831435        | ram@gmail.com  | E364785521  | PNQ002     |
| 2       | 6458972347 | Sham       | Sharma    | 30    | Mumbai    | 2467831596 | 9875546258        | sham@gmail.com | F578942451  | PNQ003     |

15. Find the ticket PNR of Raghav.

```
select Ticket_pnr from passenger where
first_name='Raghav';
```

| Results |  | Messages   |  |
|---------|--|------------|--|
|         |  | Ticket_pnr |  |
| 1       |  | PNQ004     |  |