Program Project

Program ID: T5

Program Title: Introduction to AI, Data Analytics & SQL

Project Title: Railway System Database Management System

Raneem Alshaye

Maram Albalawi

Create Table Trains:

```
create table Trains (
 Train_ID number PRIMARY KEY,
 Train_Number varchar2(25),
 Speed number
);
```

Create Table Stations:

```
 create table Stations (
 Station_Code varchar2(30) PRIMARY KEY,
 Station_Name varchar2(20)
);
```

Create Table Schedules:

```
create table Schedules (
 Trip_Code varchar2(20) PRIMARY KEY,
 Departure_City varchar2(15),
 Arrival_City varchar2(35),
 Departure_Time TIMESTAMP,
 Distance number,
 Price number
);
```

Create Table Travelers

```
create table Travelers (
 Traveler_ID number PRIMARY KEY,
 Name varchar2(30),
 Phone_Number varchar2(40),
 Age number
);
```

create Table Tickets

create table Tickets (

 Ticket_ID number PRIMARY KEY,

 Travel_Date DATE,

 Trip_Code varchar2(20) REFERENCES Schedules(Trip_Code),

 Traveler_ID NUMBER REFERENCES Travelers(Traveler_ID)

);

Run All Create Table:

```
Table created.

Table created.

Table created.

Table created.

Table created.
```

Insert Trains

insert into Trains (Train_ID, Train_Number, Speed) values (100, 'SA110', 80);

insert into Trains (Train_ID, Train_Number, Speed) values (110, 'SA100', 220);

Insert Stations

insert into Stations (Station_Code, Station_Name) values ('Makk', 'Makkah');

insert into Stations (Station_Code, Station_Name) values ('Riy', 'Riyadh');

Insert Schedules

insert into Schedules (Trip_Code, Departure_City, Arrival_City, Departure_Time, Distance, Price)

values ('SA110', 'Riyadh', 'Makkah', TO_TIMESTAMP('2024-03-14 06:00:00', 'YYYY-MM-DD

HH24:MI:SS'), 800, 100);

insert into Schedules (Trip_Code, Departure_City, Arrival_City, Departure_Time, Distance, Price)

values ('SA100', 'Riyadh', 'Abha', TO_TIMESTAMP('2024-03-15 07:00:00', 'YYYY-MM-DD HH24:MI:SS'), 850, 200);

Insert Travelers

insert into Travelers (Traveler_ID, Name, Phone_Number, Age) values (101, 'Raneem Alshaye', '0553824570', 25);

insert into Travelers (Traveler_ID, Name, Phone_Number, Age) values (102, 'Maram Albalawi', '0551493327', 26);

Insert Tickets

insert into Tickets (Ticket_ID, Travel_Date, Trip_Code, Traveler_ID) values (004, TO_DATE('2024-03-14', 'YYYY-MM-DD'), 'SA100', 101);

insert into Tickets (Ticket_ID, Travel_Date, Trip_Code, Traveler_ID) values (005, TO_DATE('2024-03-15', 'YYYY-MM-DD'), 'SA110', 102);

Run All insert

```
1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

Question

1. **Retrieve all train information including train number, speed, and other relevant details.**

   Select * from Trains;

   ```
   1   Select * from Trains;
   ```

TRAIN_ID	TRAIN_NUMBER	SPEED
100	SA110	80
110	SA100	220

2. **List all stations along with their station code and name.**

   select * from Stations;

   ```
   1   select * from Stations;
   ```

STATION_CODE	STATION_NAME
Makk	Makkah
Riy	Riyadh

3. **Display the schedule for a specific trip, including departure city, arrival city, departure time, distance, and price.**

   select * from Schedules where Trip_Code = 'SA110';

TRIP_CODE	DEPARTURE_CITY	ARRIVAL_CITY	DEPARTURE_TIME	DISTANCE	PRICE
SA110	Riyadh	Makkah	14-MAR-24 06.00.00.000000 AM	800	100

   ```
   select * from Schedules
   where Trip_Code = 'SA110';
   ```

4. Show traveler information such as name, phone number, and age.

select * from Travelers;

```
select * from Travelers;
```

TRAVELER_ID	NAME	PHONE_NUMBER	AGE
101	Raneem Alshaye	0553824570	25
102	Maram Albalawi	0551493327	26

5. Retrieve ticket information for a given date, including trip number and client number.

select * from Tickets where Travel_Date = TO_DATE('2024-03-14', 'YYYY-MM-DD');

```
select * from Tickets
where Travel_Date = TO_DATE('2024-03-14', 'YYYY-MM-DD');
```

TICKET_ID	TRAVEL_DATE	TRIP_CODE	TRAVELER_ID
4	14-MAR-24	SA100	101

6. List all booked tickets for a specific client.

select * from Tickets where Traveler_ID = 102;

```
select * from Tickets where Traveler_ID = 102;
```

TICKET_ID	TRAVEL_DATE	TRIP_CODE	TRAVELER_ID
5	15-MAR-24	SA110	102

7. Display the available train schedules for a given date.

select * from Schedules where TRUNC(Departure_Time) = TO_DATE('2024-03-15', 'YYYY-MM-DD');

```
select * from Schedules
where TRUNC(Departure_Time) = TO_DATE('2024-03-15', 'YYYY-MM-DD');
```

TRIP_CODE	DEPARTURE_CITY	ARRIVAL_CITY	DEPARTURE_TIME	DISTANCE	PRICE
SA100	Riyadh	Abha	15-MAR-24 07.00.00.000000 AM	850	200

8. Show the total number of available seats for each trip.

SELECT s.Trip_Code, s.Departure_City, s.Arrival_City, (100 - COALESCE(t.Tickets_Sold, 0)) AS Available_Seats

FROM Schedules s LEFT JOIN (select Trip_Code, COUNT(Ticket_ID) AS Tickets_Sold

FROM Tickets GROUP BY Trip_Code) t ON s.Trip_Code = t.Trip_Code;

```
SELECT s.Trip_Code, s.Departure_City, s.Arrival_City, (100 - COALESCE(t.Tickets_Sold, 0)) AS Available_Seats
FROM Schedules s LEFT JOIN ( select Trip_Code, COUNT(Ticket_ID) AS Tickets_Sold
 FROM Tickets GROUP BY Trip_Code ) t ON s.Trip_Code = t.Trip_Code;
```

TRIP_CODE	DEPARTURE_CITY	ARRIVAL_CITY	AVAILABLE_SEATS
SA110	Riyadh	Makkah	99
SA100	Riyadh	Abha	99

9-List all trips with their departure and arrival cities

select Trip_Code, Departure_City, Arrival_City from Schedules;

```
select Trip_Code, Departure_City, Arrival_City from Schedules;
```

TRIP_CODE	DEPARTURE_CITY	ARRIVAL_CITY
SA110	Riyadh	Makkah
SA100	Riyadh	Abha

10- Display the total revenue generated from ticket sales for a specific date range

select SUM((select Price from Schedules where Trip_Code = t.Trip_Code)) AS Total_Revenue

FROM Tickets t WHERE t.Travel_Date BETWEEN TO_DATE ('2024-03-14' ,'YYYY-MM-DD') AND TO_DATE ('2024-03-15' ,'YYYY-MM-DD');

```
select SUM((select Price from Schedules where Trip_Code = t.Trip_Code)) AS Total_Revenue
FROM Tickets t
WHERE t.Travel_Date BETWEEN TO_DATE ('2024-03-14' ,'YYYY-MM-DD') AND  TO_DATE ('2024-03-15' ,'YYYY-MM-DD');
```

TOTAL_REVENUE
300

11. Show the average speed of all trains.

select AVG(Speed) AS Average_Speed,Train_ID from Trains group by Train_ID ;

```
select AVG(Speed) AS Average_Speed,Train_ID from Trains
 group by Train_ID ;
```

AVERAGE_SPEED	TRAIN_ID
80	100
220	110

12. Retrieve the most popular departure and arrival cities based on the number of trips.

SELECT City, MAX(Count) AS Popular_city FROM (

  SELECT Departure_City AS City, COUNT(*) AS Count FROM Schedules

  GROUP BY Departure_City

  UNION ALL

  SELECT Arrival_City, COUNT(*)

  FROM Schedules

  GROUP BY Arrival_City)

GROUP BY City

ORDER BY Max_Count DESC

)

```
SELECT City, MAX(Count) AS Popular_city
FROM (
  SELECT Departure_City AS City, COUNT(*) AS Count
  FROM Schedules
  GROUP BY Departure_City
  UNION ALL
  SELECT Arrival_City, COUNT(*)
  FROM Schedules
  GROUP BY Arrival_City
)
GROUP BY City
ORDER BY Max_Count DESC
```

CITY	MAX_COUNT
Riyadh	2
Makkah	1
Abha	1

13. List all trips sorted by departure time.

select * from Schedules ORDER BY Departure_Time;

```
select * from Schedules ORDER BY Departure_Time;
```

TRIP_CODE	DEPARTURE_CITY	ARRIVAL_CITY	DEPARTURE_TIME	DISTANCE	PRICE
SA110	Riyadh	Makkah	14-MAR-24 06.00.00.000000 AM	800	100
SA100	Riyadh	Abha	15-MAR-24 07.00.00.000000 AM	850	200

14. Display the total distance traveled by each train.

SELECT Trains.Train_ID, Trains.Train_Number, SUM(Schedules.Distance) AS Total_Distance

FROM Trains

JOIN Schedules ON Trains.Train_Number = Schedules.Trip_Code

GROUP BY Trains.Train_ID, Trains.Train_Number;

```
SELECT Trains.Train_ID, Trains.Train_Number, SUM(Schedules.Distance) AS Total_Distance
FROM Trains
JOIN Schedules ON Trains.Train_Number = Schedules.Trip_Code
GROUP BY Trains.Train_ID, Trains.Train_Number;
```

TRAIN_ID	TRAIN_NUMBER	TOTAL_DISTANCE
100	SA110	800
110	SA100	850

15. Show the total number of tickets booked for each trip.

SELECT Trip_Code, COUNT(*) AS Total_Tickets

FROM Tickets

GROUP BY Trip_Code

```
SELECT Trip_Code, COUNT(*) AS Total_Tickets
FROM Tickets
GROUP BY Trip_Code
```

TRIP_CODE	TOTAL_TICKETS
SA110	1
SA100	1