

Railway System Database Management System

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Creating tables

```
create table trains(  
    train_number number,  
    train_speed number,  
    max_seats number,  
    constraint pk_trains primary key (train_number)  
);  
  
create table stations(  
    station_code number,  
    station_name varchar2(50),  
    constraint pk_stations primary key (station_code)  
);  
  
create table schedules(  
    trip_code number,  
    train_id number,  
    departure_city varchar2(50),  
    arrival_city varchar2(50),  
    departure_time timestamp,  
    distance float,  
    price float,  
    constraint pk_trips primary key (trip_code),  
    constraint fk_trips_train_id foreign key (train_id)  
        references trains (train_number)  
);
```

```
create table travelers(  
    traveler_id number,  
    name varchar2(20),  
    phone_number varchar2(20),  
    age number,  
    constraint pk_travelers primary key (traveler_id)  
);  
  
create table tickets(  
    trip_number number,  
    client_number number,  
    ticket_date date,  
    constraint pk_tickets primary key (trip_number, client_number),  
    constraint fk_tickets_trip_number foreign key (trip_number)  
        references schedules (trip_code),  
    constraint fk_tickets_client_number foreign key (client_number)  
        references travelers (traveler_id)  
);
```

Inserting values

```
insert into trains (train_number, train_speed, max_seats) values (1001, 120, 500);  
insert into trains (train_number, train_speed, max_seats) values (1002, 160, 350);  
insert into trains (train_number, train_speed, max_seats) values (1003, 100, 200);
```

```
insert into stations (station_code, station_name) values (101, 'Riyadh Central Station');  
insert into stations (station_code, station_name) values (102, 'Jeddah Station');  
insert into stations (station_code, station_name) values (103, 'Dammam Station');
```

```
insert into trips (trip_code, train_id, departure_city, arrival_city, departure_time, distance,  
price) values (2001, 1001, 'Riyadh', 'Jeddah', TO_TIMESTAMP('2024-03-15 08:00:00', 'YYYY-MM-DD  
HH24:MI:SS'), 900, 250.00);  
insert into trips (trip_code, train_id, departure_city, arrival_city, departure_time, distance,  
price) values (2002, 1002, 'Jeddah', 'Dammam', TO_TIMESTAMP('2024-03-16 10:00:00', 'YYYY-MM-DD  
HH24:MI:SS'), 600, 180.00);  
insert into trips (trip_code, train_id, departure_city, arrival_city, departure_time, distance,  
price) values (2003, 1003, 'Dammam', 'Riyadh', TO_TIMESTAMP('2024-03-17 14:00:00', 'YYYY-MM-DD  
HH24:MI:SS'), 900, 250.00);
```

Inserting values

```
insert into travelers (traveler_id, name, phone_number, age) values (3001, 'Ali Hassan',  
'+966551234567', 35);  
insert into travelers (traveler_id, name, phone_number, age) values (3002, 'Fatima Ahmed',  
'+966519876543', 28);  
insert into travelers (traveler_id, name, phone_number, age) values (3003, 'Omar Mohammed',  
'+966501239876', 42);
```

```
insert into tickets (trip_number, client_number, ticket_date) values (2001, 3001, TO_DATE('2024-03-13',  
'YYYY-MM-DD'));  
insert into tickets (trip_number, client_number, ticket_date) values (2002, 3002, TO_DATE('2024-03-14',  
'YYYY-MM-DD'));  
insert into tickets (trip_number, client_number, ticket_date) values (2001, 3003, TO_DATE('2024-03-12',  
'YYYY-MM-DD'));
```


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

```
select * from trains;
```

TRAIN_NUMBER	TRAIN_SPEED	MAX_SEATS
1001	120	500
1002	160	350
1003	100	200

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

```
select * from stations;
```

STATION_CODE	STATION_NAME
101	Riyadh Central Station
102	Jeddah Station
103	Dammam Station

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

```
select departure_city, arrival_city, departure_time, distance, price  
from schedules  
where trip_code = 2001;
```

DEPARTURE_CITY	ARRIVAL_CITY	DEPARTURE_TIME	DISTANCE	PRICE
Riyadh	Jeddah	15-MAR-24 08.00.00.000000 AM	900	250

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

```
select * from travelers;
```

TRAVELER_ID	NAME	PHONE_NUMBER	AGE
3001	Ali Hassan	+966551234567	35
3002	Fatima Ahmed	+966519876543	28
3003	Omar Mohammed	+966501239876	42

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

```
select * from tickets  
where ticket_date = TO_DATE('12/MAR/2024','dd/mon/yyyy');
```

TRIP_NUMBER	CLIENT_NUMBER	TICKET_DATE
2001	3003	12-MAR-24

6. List all booked tickets for a specific client.

```
select t.* from tickets t  
inner join travelers tr on t.client_number = tr.traveler_id  
where tr.name = 'Ali Hassan';
```

TRIP_NUMBER	CLIENT_NUMBER	TICKET_DATE
2001	3001	13-MAR-24

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

```
select s.departure_city, s.arrival_city, s.departure_time, s.distance, s.price
from schedules s
where trunc(s.departure_time) = to_timestamp('15/MAR/2024','dd/mon/yyyy');
```

DEPARTURE_CITY	ARRIVAL_CITY	DEPARTURE_TIME	DISTANCE	PRICE
Riyadh	Jeddah	15-MAR-24 08.00.00.000000 AM	900	250

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

```
select s.trip_code, t.max_seats
from schedules s
inner join trains t on s.train_id = t.train_number;
```

TRIP_CODE	MAX_SEATS
2001	500
2002	350
2003	200

9. List all trips with their corresponding departure and arrival cities.

```
select trip_code, departure_city, arrival_city
from schedules;
```

TRIP_CODE	DEPARTURE_CITY	ARRIVAL_CITY
2001	Riyadh	Jeddah
2002	Jeddah	Dammam
2003	Dammam	Riyadh

SUM(PRICE)

```
select sum(price)
from schedules
where trunc(departure_time) > to_date('15/MAR/2024','dd/mon/yyyy')
and trunc(departure_time) < to_date('18/MAR/2024','dd/mon/yyyy');
```

AVG(TRAIN_SPEED)

126.666666666666666666666666666667

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

```
select stats_mode(departure_city), stats_mode(arrival_city)
from schedules;
```

STATS_MODE(DEPARTURE_CITY)

STATS_MODE (ARRIVAL_CITY)

Dammam

Dammam

13. List all trips sorted by departure time.

```
select *  
from schedules  
order by departure_time;
```

TRIP_CODE	TRAIN_ID	DEPARTURE_CITY	ARRIVAL_CITY	DEPARTURE_TIME	DISTANCE	PRICE
2001	1001	Riyadh	Jeddah	15-MAR-24 08.00.00.000000 AM	900	250
2002	1002	Jeddah	Dammam	16-MAR-24 10.00.00.000000 AM	600	180
2003	1003	Dammam	Riyadh	17-MAR-24 02.00.00.000000 PM	900	250

14. Display the total distance traveled by each train.

```
select t.train_number, sum(s.distance)  
from trains t  
inner join schedules s on t.train_number = s.train_id  
group by t.train_number;
```

TRAIN_NUMBER	SUM(S.DISTANCE)
1001	900
1002	600
1003	900

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

```
select s.trip_code, count(*)  
from schedules s  
inner join tickets t on s.trip_code = t.trip_number  
group by s.trip_code;
```

TRIP_CODE	COUNT(*)
2001	2
2002	1

Thank you for listening!