PROJECT OVERVIEW:

Developing a **Railway Database Management System** in Oracle SQL, this project involves developing a databased to manage various aspects of a railway system, including trains, station, routes, passenger detail, tickets booking. Here a structured approach to building a project.

DATABASE SCHEMA:

The database will consist of the following tables

1.PASSENGERS

- ➢ **Passenger_id (Primary_key)**
- ➢ **First_name**
- ➢ **Last_name**
- ➢ **Gender**
- ➢ **Age**
- ➢ **Mobile_number**
- ➢ **DOB**

2.STATION

- ➢ **Station_id (Primary_key)**
- ➢ **Station_name**
- ➢ **Location**

3.TRAIN

- ➢ **Train_id (Primary_key)**
- ➢ **Train_name**
- ➢ **Train_type**

4.ROUTES

- ➢ **Route_id (Primary_key)**
- ➢ **Train_id (Foreign_key)**
- ➢ **Station_id (Foreign_Key)**

➢ Arraival_time

5.TICKETS

➢ **Ticket_id (Primary_Key)**
➢ **Passenger_id (Foreign_key)**
➢ **Train_id(Foreign_key)**
➢ **Source_station_id (Foreign_key)**
➢ **Destination_station_id(Foreign_key)**
➢ **Travel_date**
➢ **Booking_date**
➢ **Seat_number**
➢ **Class**
➢ **Fare**

Table Creation: Using SQL statements to create a table

Table 1:

```
CREATE TABLE passengers (
    passenger_id    NUMBER PRIMARY KEY,
    first_name      VARCHAR2(25),
    last_name       VARCHAR2(25),
    gender          CHAR(2),
    age             NUMBER,
    mobile_number   NUMBER(10),
    dob             DATE
);
```

```
Name            Null?       Type
------------    --------    ------------
PASSENGER_ID    NOT NULL    NUMBER
FIRST_NAME      NOT NULL    VARCHAR2(25)
LAST_NAME       NOT NULL    VARCHAR2(25)
GENDER                      CHAR(2)
AGE                         NUMBER(38)
MOBILE_NUMBER               NUMBER(10)
DOB                         DATE
```

Table 2:

```sql
CREATE TABLE station (
    station         NUMBER(5) PRIMARY KEY,
    station_name    VARCHAR2(25) NOT NULL,
    location        VARCHAR2(25)
);
```

```
Name           Null?     Type
-----------    --------  ------------
STATION_ID     NOT NULL  NUMBER(5)
STATION_NAME   NOT NULL  VARCHAR2(25)
LOCATION                 VARCHAR2(25)
```

Table 3:

```sql
CREATE TABLE train (
    train_id        NUMBER(38) PRIMARY KEY,
    train_name      VARCHAR2(25) NOT NULL,
    train_type      VARCHAR2(25)
);
```

```
Name          Null?     Type
----------    --------  ------------
TRAIN_ID      NOT NULL  NUMBER(38)
TRAIN_NAME    NOT NULL  VARCHAR2(25)
TRAIN_TYPE              VARCHAR2(25)
```

Table 4:

```
CREATE TABLE routes(
    routes_id       NUMBER(5) NOT NULL,
    train_id        NUMBER(38),
    station_id      NUMBER,
    arrival_time    TIMESTAMP,
    constraint tra_routes_fk foreign key ( train_id ) references train ( train_id ),
    constraint sta_routes_fk foreign key ( station_id ) references station ( station_id ));
```

Name	Null?	Type
ROUTES_ID	NOT NULL	NUMBER(5)
TRAIN_ID		NUMBER(38)
STATION_ID		NUMBER
ARRAIVAL_TIME		TIMESTAMP(6)

Table 5:

```
create table tickets(
    ticket_id NUMBER(38) primary key,
    passenger_id NUMBER,
    train_id INT,
    source_station_id NUMBER,
    destinatio_station_id
    NUMBER, travel_date DATE,
    booking_date DATE,
    seat_number NUMBER(20),
    class VARCHAR2(25),
    fare NUMBER(10)
    );
```

```
Name                           Null?      Type
----------------------------   --------   ------------
TICKET_ID                      NOT NULL   NUMBER(38)
PASSENGER_ID                              NUMBER
TRAIN_ID                                  NUMBER(38)
SOURCE_STATION_ID                         NUMBER
DESTINATION_STATION_ID                    NUMBER(5)
TRAVEL_DATE                               DATE
BOOKING_DATE                              DATE
SEAT_NUMBER                               NUMBER(38)
CLASS                                     VARCHAR2(10)
FARE                                      NUMBER
```

DATA INSERTION:

Inserting sample data in passengers table:

```sql
insert into passengers values(seq_pass_1.nextval,'Mila','Richardson','F',24,139483,'23-05-2017');
insert into passengers values(seq_pass_1.nextval,'Nora','Howard','F',27,139782,'21-02-2003');
insert into passengers values(seq_pass_1.nextval,'Tyler','Cox','M',23,1393492,'10-04-2019');
insert into passengers values(seq_pass_1.nextval,'Brandon','Cooper','M',29,135492,'16-03-2016');
insert into passengers values(seq_pass_1.nextval,'Ela','Rivera','F',28,139490,'19-08-2017');
insert into passengers values(seq_pass_1.nextval,'Justin','Bailey','F',20,1394943,'19-04-2019');
insert into passengers values(seq_pass_1.nextval,'Zeo','Murphy','M',28,139292,'29-07-2003');
insert into passengers values(seq_pass_1.nextval,'Kevin','Bell','M',20,139792,'20-02-2003');
insert into passengers values(seq_pass_1.nextval,'Luna','Morgan','F',25,13932,'26-04-2005');
insert into passengers values(seq_pass_1.nextval,'Aaron','cook','F',20,139292,'18-03-2007');
insert into passengers values(seq_pass_1.nextval,'Dylan','ROgerts','F',28,139392,'20-05-2003');
insert into passengers values(seq_pass_1.nextval,'Hannah','Morris','F',25,139292,'25-07-2015');
insert into passengers values(seq_pass_1.nextval,'Ryan','Sanchez','M',29,139432,'24-11-2016');
insert into passengers values(seq_pass_1.nextval,'Aria','Stewart','F',34,139442,'24-01-2030');
insert into passengers values(seq_pass_1.nextval,'Joshua','Collins','F',26,139442,'29-04-2010');
```

PASSENGER_ID	FIRST_NAME	LAST_NAME	GENDER	AGE	MOBILE_NUMBER	DOB
1001	John	Doe	M	20	123281	21-02-90
1002	Jane	Smith	M	23	183423	24-03-20
1003	Michel	Brown	M	23	123842	13-09-94
1004	Emily	Davis	F	23	124840	14-07-99
1005	Chrls	Wilson	F	25	299490	16-06-92
1006	Olivia	Johnson	M	31	139492	27-08-00
1007	David	Garcia	M	29	453945	29-08-00
1008	Sophia	Martinez	F	20	3953549	29-08-00
1009	James	Lee	M	26	1484732	25-08-03
1010	Isabella	Hernandez	F	29	139494	24-07-04
1011	William	Clark	M	24	139443	21-06-07
1012	Pavi	Krish	F	24	139443	21-06-07
1013	Mia	Walker	F	25	139483	24-04-09
1014	Alexender	Hall	M	27	139402	25-06-05
1015	Charlotte	Young	F	28	139392	29-03-02

Inserting data into station table:

```
insert into station values(seq_sta_3.nextval,'Theni City','Theni');
insert into station values(seq_sta_3.nextval,'kerala City','kerala');
insert into station values(seq_sta_3.nextval,'Coimbatore City','Coimbatore');
insert into station values(seq_sta_3.nextval,'Tirunelveli Central','Tirunelveli');
insert into station values(seq_sta_3.nextval,'Thanjavur Central','Thanjavur');
insert into station values(seq_sta_3.nextval,'Madurai City','Madurai');
insert into station values(seq_sta_3.nextval,'Trichy Central','Trichy');
insert into station values(seq_sta_3.nextval,'Hyderabad Central','Hyderabad');
insert into station values(seq_sta_3.nextval,'Banglore city','banglore');
insert into station values(seq_sta_3.nextval,'Chennai Central','Chennai');
```

STATION_ID	STATION_NAME	LOCATION
1	Chennai Central	Chennai
2	Banglore city	banglore
3	Hyderabad Central	Hyderabad
4	Trichy Central	Trichy
5	Madurai City	Madurai
6	Thanjavur Central	Thanjavur
7	Tirunelveli Central	Tirunelveli
8	Coimbatore City	Coimbatore
9	kerala City	kerala
10	Theni City	Theni

Inserting data into train table:

```
insert into train values(seq_train_2.nextval,'Sampoorna Kranti express','Express');
insert into train values(seq_train_2.nextval,'Mandovi express','Express');
insert into train values(seq_train_2.nextval,'palace on Wheels','Luxury');
insert into train values(seq_train_2.nextval,'Konkan kanya','Express');
insert into train values(seq_train_2.nextval,'vandhe Baharat','Luxury');
insert into train values(seq_train_2.nextval,'Tejas Baharat','Luxury');
insert into train values(seq_train_2.nextval,'Tejas Express','Express');
insert into train values(seq_train_2.nextval,'Intercity Express','Express');
insert into train values(seq_train_2.nextval,'Humsafar Express','Express');
insert into train values(seq_train_2.nextval,'Garib Rath','Economy');
insert into train values(seq_train_2.nextval,'Duronto Express','Express');
insert into train values(seq_train_2.nextval,'Rajdhani express','Express');
```

TRAIN_ID	TRAIN_NAME	TRAIN_TYPE
101	Cennai Express	Express
102	Bangloare Mail	Mail
103	Rajdhani express	Express
104	Duronto Express	Express
105	Garib Rath	Economy
106	Humsafar Express	Express
107	Intercity Express	Express
108	Tejas Express	Express
109	Tejas Baharat	Luxury
110	vandhe Baharat	Luxury
111	Konkan kanya	Express
112	palace on Wheels	Luxury
113	Mandovi express	Express
114	Sampoorna Kranti express	Express
115	Howrah Kranti express	Express

Inserting data into routes table:

```
insert into routes values(seq__route_4.nextval,110,5);
insert into routes values(seq__route_4.nextval,109,4);
insert into routes values(seq__route_4.nextval,108,3);
insert into routes values(seq__route_4.nextval,107,10);
insert into routes values(seq__route_4.nextval,106,9);
insert into routes values(seq__route_4.nextval,105,7);
insert into routes values(seq__route_4.nextval,104,1);
insert into routes values(seq__route_4.nextval,103,8);
insert into routes values(seq__route_4.nextval,102,6);
insert into routes values(seq__route_4.nextval,101,2);
```

ROUTES_ID	TRAIN_ID	STATION_ID	ARRAIVAL_TIME
5016	102	5	27-12-24 09:15:05.000000000 AM
5017	104	2	26-12-24 10:15:05.000000000 AM
5018	106	8	31-12-24 11:15:05.000000000 AM
5019	109	7	12-12-24 07:15:05.000000000 AM
5020	106	8	15-01-25 04:30:10.000000000 AM
5005	101	2	31-12-24 12:30:00.000000000 PM
5006	102	6	30-12-24 07:15:00.000000000 AM
5007	103	8	27-02-25 03:15:00.000000000 AM
5008	104	1	15-01-25 11:30:00.000000000 AM
5009	105	7	13-01-25 09:10:00.000000000 AM
5010	106	9	31-12-24 10:00:00.000000000 AM
5011	107	10	26-01-25 09:30:00.000000000 AM
5012	108	3	19-12-24 06:30:00.000000000 AM
5013	109	4	12-01-25 09:30:00.000000000 AM
5014	110	5	25-12-24 10:30:00.000000000 AM

Insert data into tickets table:

TICKET_ID	PASSENGER_ID	TRAIN_ID	SOURCE_STATION_ID	DESTINATION_STATION_ID	TRAVEL_DATE	BOOKING_DATE	SEAT_NUMBER	CLASS	FARE
10002	1002	101	1	2	25-12-24	23-12-24	12	AC	1000
10003	1007	102	2	1	31-12-24	20-12-24	17	NON-AC	1500
10004	1009	103	4	5	15-01-25	12-01-25	10	AC	2500
10005	1008	104	3	5	12-01-25	23-12-24	76	AC	2700
10006	1004	107	2	4	26-01-25	24-01-25	18	SLEEPER	1200
10007	1020	110	8	9	17-01-25	23-12-24	19	NON-AC	1300
10008	1021	115	2	1	31-12-24	23-12-24	14	AC	1000
10009	1035	112	7	8	15-01-25	23-12-24	20	AC	1300
10010	1022	109	8	9	17-01-25	26-12-24	34	NON-AC	900
10011	1045	104	3	5	12-01-25	29-12-24	56	SLEEPER	1500
10012	1025	103	2	7	31-12-24	20-12-24	16	AC	1800
10013	1015	114	1	2	26-01-25	20-12-24	42	SLEEPER	2000
10014	1027	114	1	2	26-01-25	20-12-24	42	NON-AC	2500
10015	1038	110	2	3	29-01-25	20-12-24	49	NON-AC	500
10016	1025	112	4	3	26-01-25	21-12-24	51	AC	2400
10018	1022	111	8	3	31-12-24	21-12-25	35	SLEEPER	1700
10019	1009	103	9	2	15-01-25	20-12-24	10	SLEEPER	2500
10020	1022	109	2	9	29-01-25	24-01-25	64	NON-AC	900

(Alter ,Update the records):

```
alter table routes add Arraival_time timestamp;
update routes set arraival_time='26-01-2025 09:30:00' where station_id=10;
update routes set arraival_time='31-12-2024 10:00:00' where station_id=9;
update routes set arraival_time='27-02-2025 03:15:00' where station_id=8;
update routes set arraival_time='19-12-2024 06:30:00' where station_id=3;
update routes set arraival_time='30-12-2024 07:15:00' where station_id=6;
update routes set arraival_time='13-01-2025 09:10:00' where station_id=7;
update routes set arraival_time='12-01-2025 09:30:00' where station_id=4;
update routes set arraival_time='15-01-2025 11:30:00' where station_id=1;
update routes set arraival_time='31-12-2024 12:30:00' where station_id=2;
```

```
alter table  tickets modify destination_station_id int;
```

```
alter table routes rename column  arraival_time  to Boarding_time;
```

```
alter table routes drop column departure_time;
alter table routes drop column Arraival_time;
```