Create all the tables specified above. Make underlined columns as primary key.(use number, number(m,n), varchar(n), date, time, timestamp datatypes appropriately) (Low Level)

Insert atleast 5 rows to each table. (Check [www.irctc.co.in](http://www.irctc.co.in/) website for actual data)

1. Use Interactive insertion for inserting rows to the table.

# Train:

SQL> create table Train(

* 1. Train\_number number(10),
  2. name varchar(20),source varchar(20),destination varchar(20),start\_time timestamp, 4 reach\_time timestamp,traveltime number(4,2),distance number(7,2),

5 class varchar(30),days number(10),type varchar(30), 6 constraint tno\_pk primary key(Train\_number)

7 );

Table created.

SQL> desc Train;

Name Null? Type

TRAIN\_NUMBER NOT NULL NUMBER(10) NAME VARCHAR2(20)

SOURCE VARCHAR2(20)

DESTINATION VARCHAR2(20)

START\_TIME TIMESTAMP(6)

REACH\_TIME TIMESTAMP(6)

TRAVELTIME NUMBER(4,2)

DISTANCE NUMBER(7,2)

CLASS VARCHAR2(30)

DAYS NUMBER(10)

TYPE VARCHAR2(30)

SQL> insert into train values(&train\_number,'&name','&source','&destination', 2 '&start\_time','&reach\_time',&traveltime,&distance,'&class',&days,'&type'

3 );

Enter value for train\_number: 11625 Enter value for name: Shatabdi Express Enter value for source: Amritsar

Enter value for destination: Delhi

old 1: insert into train values(&train\_number,'&name','&source','&destination', new 1: insert into train values(01625,'Shatabdi Express','Amritsar','Delhi',

….

1 row created.

SQL> select \* from train;

TRAIN\_NUMBER NAME SOURCE DESTINATION START\_TIME

REACH\_TIME

TRAVELTIME DISTANCE CLASS DAYS TYPE

11625 Shatabdi Express Amritsar Delhi 20-SEP-23 02.00.00.000000 AM 20-SEP-23 09.00.00.000000 AM

7 450 1A 1 Long-Distance

14981 Doronto Express Hyderabad Bangalore 15-AUG-22 05.27.30.000000 AM 17-AUG-22 08.11.00.000000 AM

6 400 EA 1 Short-Distance

# Ticket:

SQL> create table Ticket(PNR\_no number(10),Transactionid number(15),From\_station varchar(20),To\_station varchar(20),date\_of\_journey date,class varchar(30),date\_of\_booking date,total\_ticket\_fare number(20),train\_number number(20),constraint pnr\_pk primary key(PNR\_no));

Table created.

SQL> desc Ticket;

Name Null? Type

PNR\_NO NOT NULL NUMBER(10) TRANSACTIONID NUMBER(15)

FROM\_STATION VARCHAR2(20)

TO\_STATION VARCHAR2(20)

DATE\_OF\_JOURNEY DATE

CLASS VARCHAR2(30)

DATE\_OF\_BOOKING DATE

TOTAL\_TICKET\_FARE NUMBER(20)

TRAIN\_NUMBER NUMBER(20)

SQL> insert into ticket values(&pnr\_no,&Transactionid,'&from\_station','&to\_station',

2 '&date\_Of\_journey','&class','&date\_of\_booking',&total\_ticket\_fare,&train\_number

3 );

Enter value for pnr\_no: 1182300376

Enter value for transactionid: 198764522198751 Enter value for from\_station: Vellore

Enter value for to\_station: Tirupati

old 1: insert into ticket values(&pnr\_no,&Transactionid,'&from\_station','&to\_station', new 1: insert into ticket values(1182300376,198764522198751,'Vellore','Tirupati',

1 row created.

SQL> select \* from ticket;

PNR\_NO TRANSACTIONID FROM\_STATION TO\_STATION DATE\_OF\_J CLASS DATE\_OF\_B TOTAL\_TICKET\_FARE TRAIN\_NUMBER

1182300376 1.9876E+14 Vellore Tirupati 04-DEC-19 2A 01-DEC-19

300 05430

5234109753 9.8070E+14 Amritsar Delhi 20-SEP-23 1A 17-JAN-23

600 01625

# Passenger:

SQL> create table passenger(PNR\_no number(10),Serial\_no varchar(8), 2 Name varchar(30),age number(3),Reservation\_status varchar(20),

3 constraint pnr\_fk foreign key(PNR\_no) references Ticket (PNR\_no), 4 constraint serno\_pk primary key(Serial\_no)

5 );

Table created.

SQL> desc passenger;

Name Null? Type

PNR\_NO NUMBER(10)

SERIAL\_NO NOT NULL VARCHAR2(8) NAME VARCHAR2(30)

AGE NUMBER(3)

RESERVATION\_STATUS VARCHAR2(20)

SQL> insert into passenger values(&pnr\_no,'&serial\_no','&name',&age, 2 '&reservation\_status');

Enter value for pnr\_no: 1174520980 Enter value for serial\_no: 3

Enter value for name: Lauryn Enter value for age: 20

SQL> select \* from passenger;

PNR\_NO SERIAL\_N NAME AGE RESERVATION\_STATUS

|  |  |  |
| --- | --- | --- |
| 1182300376 1 | Sumita | 28 Confirmed |
| 5234109753 2 | Rajesh | 37 RAC |
| 1174520980 3 | Lauryn | 20 Confirmed |

# Train route:

SQL> create table Train\_Route(Train\_no number(10),route\_no number(10), 2 station\_code varchar(3),Name varchar(20),arrival\_time timestamp,

1. depart\_time timestamp,distance number(7,2),day varchar(10),
2. constraint tno\_fk foreign key(Train\_no) references Train (Train\_number), 5 constraint rno\_pk primary key(route\_no)

6 );

Table created.

SQL> desc Train\_route;

Name Null? Type

TRAIN\_NO NUMBER(10)

ROUTE\_NO NOT NULL NUMBER(10) STATION\_CODE VARCHAR2(3)

NAME VARCHAR2(20)

ARRIVAL\_TIME TIMESTAMP(6)

DEPART\_TIME TIMESTAMP(6)

DISTANCE NUMBER(7,2)

DAY VARCHAR2(10)

SQL> insert into train\_route values(&train\_no,&route\_no,'&station\_code','&name', 2 '&arrival\_time','&depart\_time',&distance,'&day');

Enter value for train\_no: 11625 Enter value for route\_no: 210 Enter value for station\_code: ASR

Enter value for name: Amritsar Station

old 1: insert into train\_route values(&train\_no,&route\_no,'&station\_code','&name', new 1: insert into train\_route values(1625,210,'ASR','Amritsar Station',

SQL> select \* from train\_route;

TRAIN\_NO ROUTE\_NO STA NAME ARRIVAL\_TIME DEPART\_TIME DISTANCE DAY

11625 210 ASR Amritsar Station 20-SEP-23 09.00.00.000000 AM

20-SEP-23 02.00.00.000000 AM 450 1

14981 67 HYD Memorial Station 17-AUG-22 08.11.00.000000 AM

15-AUG-22 05.27.30.000000 AM 400 1

# Train Ticket Fare

SQL> create table Train\_Ticket\_fare(Train\_no number(10),class varchar(30),

2 base\_fare number(10),reservation\_charge number(10),superfast\_charge number(10), 3 other\_charge number(10),taktal\_charge number(10),service\_tax number(10),

4 constraint trno\_fk foreign key(Train\_no) references Train(Train\_number), 5 constraint class\_pk primary key(class)

6 );

Table created.

SQL> desc Train\_Ticket\_fare;

Name Null? Type

|  |  |  |
| --- | --- | --- |
| TRAIN\_NO |  | NUMBER(10) |
| CLASS | NOT NULL | VARCHAR2(30) |
| BASE\_FARE |  | NUMBER(10) |
| RESERVATION\_CHARGE |  | NUMBER(10) |
| SUPERFAST\_CHARGE |  | NUMBER(10) |
| OTHER\_CHARGE |  | NUMBER(10) |
| TAKTAL\_CHARGE |  | NUMBER(10) |

SERVICE\_TAX NUMBER(10)

SQL> insert into train\_ticket\_fare values(&train\_No,'&class',&BASE\_FARE,&RESERVATION\_CHARGE,&SUPERFAST\_CHARGE,&OTHER\_C HARGE,&TAKTAL\_CHARGE,&SERVICE\_TAX);

Enter value for train\_no: 1625 Enter value for class: EA

Enter value for base\_fare: 250

Enter value for reservation\_charge: 20

SQL> select \* from train\_ticket\_fare;

TRAIN\_NO CLASS BASE\_FARE RESERVATION\_CHARGE SUPERFAST\_CHARGE OTHER\_CHARGE TAKTAL\_CHARGE SERVICE\_TAX

-

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 12300 EV | 300 | 20 | 10 | 16 | 34 | 16 |
| 12755 1A | 200 | 19 | 17 | 34 | 12 | 10 |
| 11625 EA | 250 | 20 | 34 | 10 | 4 | 10 |

SQL> select \* from passenger;

PNR\_NO SERIAL\_N NAME AGE RESERVATION\_STATUS

|  |  |  |
| --- | --- | --- |
| 1182300376 1 | Sumita | 28 Confirmed |
| 5234109753 2 | Rajesh | 37 RAC |
| 1174520980 3 | Lauryn | 20 Confirmed |
| 1198326700 4 | Ruhan | 18 Waitlisted |

Question 2. Write simple DDL/DML Queries to

1. Remove all the rows from Passenger table permanently. SQL> truncate table passenger;

Table truncated.

1. Change the name of the Passenger table to Passenger\_Details. SQL> rename Passenger to Passenger\_Details;

Table renamed.

SQL> select \* from passenger\_details;

PNR\_NO SERIAL\_N NAME AGE RESERVATION\_STATUS

|  |  |  |
| --- | --- | --- |
| 5234109753 3 | Jayalata | 78 Confirmed |
| 1098452132 4 | Suresh | 67 Waitlisted |
| 1182300376 10 | Mahira | 22 Waitlisted |

1. List all train details.

SQL> select \* from train;

TRAIN\_NUMBER NAME SOURCE DESTINATION START\_TIME REACH\_TIME TRAVELTIME DISTANCE CLASS DAYS TYPE

11625 Shatabdi Express Amritsar Delhi 20-SEP-23 02.00.00.000000 AM 20-SEP-23 09.00.00.000000 AM

7 450 1A 1 Long-Distance

14981 Doronto Express Hyderabad Bangalore 15-AUG-22 05.27.30.000000 AM 17-AUG-22 08.11.00.000000 AM

1. 400 EA 1 Short-Distance
2. List all passenger details.

SQL> select \* from passenger\_details;

no rows selected

1. Give a list of trains in ascending order of number. SQL> select \* from train order by train\_number;

TRAIN\_NUMBER NAME SOURCE DESTINATION START\_TIME REACH\_TIME TRAVELTIME DISTANCE CLASS DAYS TYPE

11625 Shatabdi Express Amritsar Delhi 20-SEP-23 02.00.00.000000 AM 20-SEP-23 09.00.00.000000 AM

1. 450 1A 1 Long-Distance

12300 Charminar Express Rajkot Dhanbaad 19-NOV-22 02.23.10.000000 AM 21-NOV-22 03.30.00.000000 AM

48.2 923.3 EV 3 Long-Distance

12755 Rajdhani Express Bombay Kovalam 02-JUN-23 08.00.50.000000 AM 03-JUN-23 07.20.00.000000 AM

21 800 1A 2 Long-Distance

1. List the senior citizen passenger details.

SQL> select \* from passenger\_details where age>=60;

PNR\_NO SERIAL\_N NAME AGE RESERVATION\_STATUS

|  |  |  |
| --- | --- | --- |
| 5234109753 3 | Jayalata | 78 Confirmed |
| 1098452132 8 | Suresh | 67 Waitlisted |

1. List the station names where code starts with 'M'. SQL> select name from train\_route

2 where station\_code like ('M%');

NAME

Mumbai Station

1. List the train details within a range of numbers.

SQL> select \* from train where train\_number between 20000 AND 50000;

TRAIN\_NUMBER NAME SOURCE DESTINATION START\_TIME

REACH\_TIME

TRAVELTIME DISTANCE CLASS DAYS TYPE

12300 Charminar Express Rajkot Dhanbaad 19-NOV-22 02.23.10.000000 AM 21-NOV-22 03.30.00.000000 AM

48.2 923.3 EV 3 Long-Distance

12755 Rajdhani Express Bombay Kovalam 02-JUN-23 08.00.50.000000 AM 03-JUN-23 07.20.00.000000 AM

21 800 1A 2 Long-Distance

14981 Doronto Express Hyderabad Bangalore 15-AUG-22 05.27.30.000000 AM 17-AUG-22 08.11.00.000000 AM

6 400 EA 1 Short-Distance

1. Change the superfast charge value in train fare as zero, if it is null. SQL> update train\_ticket\_fare set superfast\_charge=0

2 where superfast\_charge=NULL;

0 rows updated.

1. List the passenger names whose tickets are not confirmed.

SQL> select name from passenger\_details where reservation\_status like 'Waitlisted';

NAME

Suresh Mahira

1. List the base\_fare of all AC coaches available in each train.

SQL> select base\_fare from train\_ticket\_fare where class='1A' or class='2A'

2 or class='3A' ;

BASE\_FARE

200

670

300

1. Find the ticket details where transaction id is not known. SQL> select \* from ticket where transactionid=NULL;

no rows selected

1. Use interactive update for updating the seat no for a particular PNR NO. SQL> update passenger\_details
2. set serial\_no='&serial\_no'
3. where pnr\_no='&pnr\_no';

Enter value for serial\_no: 4

old 2: set serial\_no='&serial\_no' new 2: set serial\_no='4'

Enter value for pnr\_no: 1098452132 old 3: where pnr\_no='&pnr\_no' new 3: where pnr\_no='1098452132'

1 row updated.

SQL> select \* from passenger\_details;

PNR\_NO SERIAL\_N NAME AGE RESERVATION\_STATUS

|  |  |  |
| --- | --- | --- |
| 5234109753 3 | Jayalata | 78 Confirmed |
| 1098452132 4 | Suresh | 67 Waitlisted |

1. Find the train names that are from Chennai to Mumbai, but do not have the source or destination in its name.

SQL> select name from train where source='Chennai' AND destination='Mumbai' AND name NOT LIKE ('%Chennai%') AND name NOT LIKE ('%Mumbai%');

NAME

Kaveri Expresss



Question 3. Create (Alter table to add constraint) the necessary foreign keys by identifying the relationships in the table. (Middle Level)

1. Add a suitable constraint to train table to always have train no in the range 10001 to 99999. SQL> alter table train

2 add constraint check\_train\_number check(train\_number between 10001 AND 99999);

Table altered.

1. Add a suitable constraint for the column of station name, so that does not take duplicates. SQL> alter table train\_route

2 add constraint uniq\_code unique(station\_code);

Table altered.

1. Change the data type of arrival time, depart time (date -> timestamp or timestamp to date), and do the necessary process for updating the table with new values.

SQL> alter table train\_route modify(arrival\_time date);

Table altered.

SQL> alter table train\_route modify(depart\_time date);

Table altered.

SQL> select \* from train\_route;

TRAIN\_NO ROUTE\_NO STA NAME ARRIVAL\_T DEPART\_TI DISTANCE DAY

11625 210 ASR Amritsar Station 20-SEP-23 20-SEP-23 450 1

14981 67 HYD Memorial Station 17-AUG-22 15-AUG-22 400 1

SQL> update train\_route set route\_no=4,station\_code='ATR',name='RamDas Station' where train\_no=1625;

1 row updated.

1. Add a suitable constraint for the class column that it should take values only as 1A, 2A, 3A, SL, C. SQL> alter table train add constraint check\_cls check(class in ('1A','2A','3A','SL','C'));

alter table train add constraint check\_cls check(class in ('1A','2A','3A','SL','C'))

\*

ERROR at line 1:

ORA-02293: cannot validate (LAURYN.CHECK\_CLS) - check constraint violated After altering entity attribute values:

SQL> alter table train add constraint check\_cls check(class in ('1A','2A','3A','SL','C')); Table altered.

1. Add a not null constraint for the column distance in train\_route. SQL> alter table train\_route modify distance not null;

Table altered.

Question 4:

Use SQL PLUS functions to. (Low Level)

1. Find the passengers whose date of journey is one month from today SQL> select transactionid from ticket natural join passenger\_details where

to\_char(date\_of\_journey,'DD-MM-YY')=TO\_CHAR(ADD\_MONTHS(SYSDATE,1),'DD-MM-YY'); no rows selected

1. Print the train names in upper case.

SQL> select upper(name) from train;

UPPER(NAME)

SHATABDI EXPRESS DORONTO EXPRESS RAJDHANI EXPRESS KAVERI EXPRESS

6 rows selected.

1. Print the passenger names with left padding character.

SQL> select lpad(name,8,'^')Pass\_names from passenger\_details;

PASS\_NAMES

Jayalata

^^Suresh

^^Mahira

^^Lauryn

^Akshita

1. Print the station codes replacing K with M.

SQL> select replace(station\_code,'K','M') from train\_route;

REP

--- ATR RJM BMB MSB

6 rows selected.

1. Translate all the LC in class column (Train\_fare) to POT and display.

SQL> select translate(class,'LC','POT') from train\_ticket\_fare;

TRANSLATE(CLASS,'LC','POT')

EV 1A EA 3A

1. Display the fare details of all trains, if any value is ZERO, print as NULL value.

SQL> Select nullif(base\_fare,0) from train\_ticket\_fare;

NULLIF(BASE\_FARE,0)

300

200

250

300

670

1. Display the pnrno and transaction id, if transaction id is null, print 'not generated'.

SQL> Select pnr\_no, nullif(transactionid,0) from ticket;

PNR\_NO NULLIF(TRANSACTIONID,0)

|  |  |
| --- | --- |
| 1182300376 | 1.9876E+14 |
| 5234109753 | 9.8070E+14 |
| 1174520980 | 8.9012E+14 |
| 1198326700 | 9.8765E+13 |
| 1098452132 | 7.7652E+14 |

1. Print the date\_of\_jounrney in the format '27th November 2010'.

SQL> select to\_char(date\_of\_journey,’ddth month yyyy’) new\_format\_date from ticket;

NEW\_FORMAT\_DATE

04th december 2019

20th september 2023

04th december 2019

02nd june 2023

19th november 2022

1. Find the maximum fare (total fare).

SQL> select max(total\_ticket\_fare) max\_total\_fare from ticket;

MAX\_TOTAL\_FARE

1200

1. Find the average age of passengers in one ticket.

SQL> select avg(age) average\_age from passenger\_details;

AVERAGE\_AGE

41.2

1. Find the maximum length of station name available in the database.

SQL> select max(length(station\_code)) max\_station\_name\_length from train\_route;

MAX\_STATION\_NAME\_LENGTH

3

1. Print the fare amount of the passengers as rounded value.

SQL> select ceil(total\_ticket\_fare) rounded\_fare from ticket;

ROUNDED\_FARE

300

600

500

1200

1. Add the column halt time to train route.

SQL> Alter table train\_route add(halt\_time number(2)); Table altered.

SQL> update train\_route set halt\_time=20 where train\_no=12755; 2 rows updated.

SQL> update train\_route set halt\_time=35 where train\_no=11625; 1 row updated.

SQL> select \* from train\_route;

TRAIN\_NO ROUTE\_NO STA NAME ARRIVAL\_T DEPART\_TI DISTANCE DAY HALT\_TIME

11625 4 ATR RamDas Station 20-SEP-23 20-SEP-23 450 1 35

14981 67 HYD Memorial Station 17-AUG-22 15-AUG-22 400 1

6 rows selected.

1. Update values to it from arrival time and depart time.

SQL> update train\_route set halt\_time=depart\_time-arrival\_time;

6 rows updated.

SQL> select \* from train\_route;

TRAIN\_NO ROUTE\_NO STA NAME ARRIVAL\_T DEPART\_TI DISTANCE DAY HALT\_TIME

11625 4 ATR RamDas Station 20-SEP-23 20-SEP-23 450 1 0

14981 67 HYD Memorial Station 17-AUG-22 15-AUG-22 400 1 2

High Level:

1. Update values to arrival time and depart time using conversion functions.

SQL> select to\_char(arrival\_time,’YYYY/MM/DD’) from train\_route;

TO\_CHAR(AR

2023/09/20

2022/08/17

2019/12/04

6 rows selected.

SQL> select to\_char(depart\_time,’YYYY/MM/DD’) from train\_route;

TO\_CHAR(DE

2023/09/20

2022/08/15

2019/12/04

6 rows selected

1. Display the arrival time, depart time in the format HH:MI (24 hours and minutes).

SQL> select to\_char(arrival\_time,’HH24:MI’) from train\_route;

TO\_CH

09:00

08:11

6 rows selected.

SQL> select to\_char(depart\_time,’HH24:MI’) from train\_route;

TO\_CH

02:00

05:27

06:00

6 rows selected.