

RAILWAY MANAGEMENT SYSTEM

-Database Management Project

- Made by

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- Here are the Queries to retrieve the data from the relational schema from which you can understand our project more easily and deeply .*
- We have also provided you with the description of all the tables used in database.*

Tables

	Tables_in_railway
►	coaches
	fare
	passenger
	person
	phone_no
	seat
	station
	stopage
	ticket
	train
	user

Person

	Field	Type	Null	Key	Default	Extra
►	Adhaar_no	decimal(12,0)	NO	PRI	NULL	
	Fame	varchar(10)	NO		NULL	
	Mname	varchar(10)	YES		NULL	
	Lname	varchar(10)	YES		NULL	
	Sex	char(6)	NO		NULL	
	DOB	date	NO		NULL	

User

	Field	Type	Null	Key	Default	Extra
►	Adhaar_no	decimal(12,0)	YES	MUL	NULL	
	user_id	varchar(10)	NO	PRI	NULL	

Phone_no

	Field	Type	Null	Key	Default	Extra
►	Adhaar_no	decimal(12,0)	NO	PRI	NULL	
	Mobile_no	decimal(decimal(10,0))		PRI	NULL	

Train

	Field	Type	Null	Key	Default	Extra
▶	Train_no	decimal(10,0)	NO	PRI	NULL	
	name	varchar(10)	YES		NULL	
	type	varchar(10)	YES		NULL	
	status	varchar(10)	YES		NULL	

Station

	Field	Type	Null	Key	Default	Extra
▶	pincode	decimal(6,0)	NO	PRI	NULL	
	city_name	char(15)	YES		NULL	
	No_of_platforms	decimal(2,0)	YES		NULL	

Stopage

	Field	Type	Null	Key	Default	Extra
▶	Train_no	decimal(10,0)	NO	PRI	NULL	
	pincode	decimal(6,0)	NO	PRI	NULL	
	arrival_time	time	YES		NULL	
	departure_time	time	YES		NULL	
	date_of_arrival	date	YES		NULL	

Coaches

	Field	Type	Null	Key	Default	Extra
▶	Train_no	decimal(10,0)	NO	PRI	NULL	
	coach_no	decimal(2,0)	NO	PRI	NULL	
	type	varchar(10)	YES		NULL	
	total_seats	decimal(3,0)	YES		NULL	
	seats_left	decimal(3,0)	YES		NULL	

Seat

	Field	Type	Null	Key	Default	Extra
▶	Train_no	decimal(10,0)	NO	PRI	NULL	
	coach_no	decimal(2,0)	NO	PRI	NULL	
	seat_no	decimal(3,0)	NO	PRI	NULL	

Ticket

	Field	Type	Null	Key	Default	Extra
▶	Ticket_no	varchar(10)	NO	PRI	NULL	
	Train_no	decimal(10,0)	NO	MUL	NULL	
	Froom	decimal(6,0)	NO		NULL	
	Too	decimal(6,0)	NO		NULL	
	Coach_no	decimal(2,0)	NO		NULL	
	seat_no	decimal(3,0)	NO		NULL	
	travel_date	date	NO		NULL	
	No_of_passengers	decimal(2,0)	YES		1	DEFAULT_GENERATED
	payment_id	varchar(10)	NO	UNI	NULL	
	status	varchar(10)	NO		NULL	
	Platform_no	decimal(2,0)	NO		NULL	

Passenger

	Field	Type	Null	Key	Default	Extra
▶	Ticket_no	varchar(10)	YES	MUL	NULL	
	Adhaar_no	decimal(12,0)	YES	MUL	NULL	
	Passenger_id	varchar(10)	NO	PRI	NULL	

Fare

	Field	Type	Null	Key	Default	Extra
▶	Train_no	decimal(10,0)	NO	PRI	NULL	
	Froom	decimal(6,0)	NO	PRI	NULL	
	Too	decimal(6,0)	NO	PRI	NULL	
	Rupees	decimal(5,0)	YES		NULL	

SQL QUERIES

1.Find the stations which has more than 10 platforms

`select * from station where no_of_platforms>10;`

	pincode	city_name	No_of_platforms
▶	110001	Mumbai	13
	123321	Nagpur	12
	130087	Chennai	13
	132456	Kolkata	13
	138890	Patna	19
	148809	Delhi	21
	149008	Ludhiana	15
	189091	Aurangabad	14
	199088	Meerut	12
•	NULL	NULL	NULL

2.Find passenger id of all the passengers having confirmed tickets

`select passenger_id from passenger natural join ticket where ticket.status='confirmed';`

	passenger_id
▶	PASS001
	PASS003
	PASS004
	PASS007
	PASS008
	PASS009

3.Print the details of female passengers

`select * from person natural join passenger where person.sex='Female';`

	Adhaar_no	Fame	Mname	Lname	Sex	DOB	Ticket_no	Passenger_id
▶	4	Anjali	NULL	Kandola	Female	2001-04-12	TCT004	PASS004
	7	Sonal	Abdul	Khan	Female	2003-09-20	TCT007	PASS007
	8	Seema	NULL	NULL	Female	2001-03-13	TCT008	PASS008
	9	Ridhi	NULL	Joshi	Female	2003-07-11	TCT009	PASS009

4.Count mobile numbers of all the persons

`select count(adhaar_no),adhaar_no from phone_no group by adhaar_no;`

	count(adhaar_no)	adhaar_no
▶	3	1
	3	2
	2	4
	2	5
	2	6
	1	7
	2	8

5.Print the details of trains which stops at delhi(148809)

`select * from train natural join stopage where stopage.pincode='148809';`

	Train_no	name	type	status	pincode	arrival_time	departure_time	date_of_arrival
▶	244538	Shtabdi	AC	Delay	148809	12:30:00	13:15:00	2022-04-08
	564332	Garib Rath	AC	on-time	148809	08:45:00	09:30:00	2022-04-08
	844462	Kavi Guru	Long	on-time	148809	02:45:00	03:30:00	2022-04-08
	863352	Humsafar	Special	cancelled	148809	08:45:00	09:15:00	2022-04-08

6.Find the details of train from delhi to bombay

`select train_no,name,type,status from train where train_no in(select train_no from ticket where ticket.from='148809' and ticket.too='110001');`

	train_no	name	type	status
▶	564332	Garib Rath	AC	on-time

7.List the moblie number of passenger ivan

`select mobile_no from phone_no natural join passenger where adhaar_no in (select adhaar_no from person where fame='Ivan');`

	mobile_no
▶	8528592486
	8578592766
	8824592282

8. Find the trains which are cancelled

Select * from train where status='cancelled';

	Train_no	name	type	status
▶	264336	Suvidha	AC	Cancelled
	362342	Passenger	General	cancelled
	464382	Tejas	APM	cancelled
	863352	Humsafar	Special	cancelled
*	NULL	NULL	NULL	NULL

9. Find the seats left in Garib Rath

select sum(seats_left) from coaches where train_no in(select train_no from train where name='Garib rath') group by train_no;

	sum(seats_left)
▶	90

10. Find passengers details who are travelling on 8th april

select * from person where adhaar_no in(select adhaar_no from passenger natural join ticket where travel_date='2022-04-08');

	Adhaar_no	Fame	Mname	Lname	Sex	DOB
▶	1	Ivan	Nelson	Bayross	Male	2002-04-12
	2	Aditya	Kumar	Garg	Male	2002-11-13
	3	Ankit	NULL	Jha	Male	2003-06-04
	4	Anjali	NULL	Kandola	Female	2001-04-12
	5	Dipanshu	Choudhary	NULL	Male	2002-02-02
	7	Sonal	Abdul	Khan	Female	2003-09-20
	8	Seema	NULL	NULL	Female	2001-03-13
	9	Ridhi	NULL	Joshi	Female	2003-07-11
★	NULL	NULL	NULL	NULL	NULL	NULL

11.Find the city with maximum number of platforms

`select pincode,city_name,max(no_of_platforms) from station ;`

	pincode	city_name	max(no_of_platforms)
▶	110001	Mumbai	21

12.Find the persons who is user and passenger both

`select * from person where adhaar_no in (select adhaar_no from user natural join passenger);`

	Adhaar_no	Fame	Mname	Lname	Sex	DOB
▶	1	Ivan	Nelson	Bayross	Male	2002-04-12
	3	Ankit	NULL	Jha	Male	2003-06-04
	5	Dipanshu	Choudhary	NULL	Male	2002-02-02
	7	Sonal	Abdul	Khan	Female	2003-09-20
★	NULL	NULL	NULL	NULL	NULL	NULL

13.List the train number which arrive on pincode 148101

`select * from train where train_no in(select train_no from stopage where pincode='148101');`

	Train_no	name	type	status
▶	244538	Shtabdi	AC	Delay
	361739	Intercity	AC	Delay
★	NULL	NULL	NULL	NULL

14. Print all the ticket which are of garib rath

`select * from ticket where train_no in(select train_no from train where name='Garib rath');`

	Ticket_no	Train_no	From	To	Coach_no	seat_no	travel_date	No_of_passengers	payment_id	status	Platform_no
▶	TCT008	564332	148809	110001	1	12	2022-04-08	3	PI0008	CONFIRMED	3
	TCT001	564332	148809	110001	1	24	2022-04-08	4	PI0001	CONFIRMED	2
★	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

15. Find the train details from delhi having seat number 13 vacant

`select * from train where train_no in(select train_no from stopage natural join seat where seat.seat_no='13');`

	Train_no	name	type	status
▶	464832	Samparak	General	on-time
	863352	Humsafar	Special	cancelled
★	NULL	NULL	NULL	NULL

16. Check user with adhaar number 0000000001 booked ticket or not

`select ticket_no from passenger natural join user where adhaar_no='0000000001';`

	ticket_no
▶	TCT001

17. List the ticket details of passengers having coach number 1 and train number 564332

`select * from ticket natural join seat where seat.coach_no='1' and seat.train_no='564332';`

	Train_no	Coach_no	seat_no	Ticket_no	From	To	travel_date	No_of_passengers	payment_id	status	Platform_no
▶	564332	1	12	TCT008	148809	110001	2022-04-08	3	PI0008	CONFIRMED	3
	564332	1	24	TCT001	148809	110001	2022-04-08	4	PI0001	CONFIRMED	2

18. List the station of train arriving on station having pincode 148809

`select * from station natural join stopage where pincode='148809';`

	pincode	city_name	No_of_platforms	Train_no	arrival_time	departure_time	date_of_arrival
▶	148809	Delhi	21	244538	12:30:00	13:15:00	2022-04-08
	148809	Delhi	21	564332	08:45:00	09:30:00	2022-04-08
	148809	Delhi	21	844462	02:45:00	03:30:00	2022-04-08
	148809	Delhi	21	863352	08:45:00	09:15:00	2022-04-08

19. List the train that arrive on date 2022-04-08 and station pincode is 148101

`select * from station natural join stopage where pincode='148809' and date_of_arrival='2022-04-08';`

	pincode	city_name	No_of_platforms	Train_no	arrival_time	departure_time	date_of_arrival
▶	148809	Delhi	21	244538	12:30:00	13:15:00	2022-04-08
	148809	Delhi	21	564332	08:45:00	09:30:00	2022-04-08
	148809	Delhi	21	844462	02:45:00	03:30:00	2022-04-08
	148809	Delhi	21	863352	08:45:00	09:15:00	2022-04-08

20. Find the trains which are confirmed

`Select * from train where status='on-time';`

	Train_no	name	type	status
▶	342336	Intercity	General	on-time
	365352	Passenger	APM	on-time
	464832	Samparak	General	on-time
	564332	Garib Rath	AC	on-time
	564335	Superfast	Freight	on-time
	663554	Special	AC	on-time
	669434	Rajdhani	AC	on-time
	744336	Gatiman	APM	on-time
	763322	Express	AC	on-time
	844462	Kavi Guru	Long	on-time
★	NULL	NULL	NULL	NULL

21. Find the ticket details with more than 4 passengers

`select * from ticket where no_of_passengers>4;`

DOMAIN CALCULUS

- 1) Find train no. from delhi to bombay having fare <2000.
 $\{ \langle t \rangle \mid \exists b, c, d (\langle t, b, c, d \rangle \in \text{Fare} \wedge d < 2000 \wedge b = \text{'Delhi'} \wedge c = \text{'Bombay'}) \}$
- 2) Find ticket_no having more than 4 passengers.
 $\{ \langle t \rangle \mid \langle t, a, b, c, d, e, f, g, h, i, j \rangle \in \text{Ticket} \wedge g > t \}$
- 3) List the pincode and cities which have only one platform.
 $\{ \langle p, c \rangle \mid \langle p, c, n \rangle \in \text{station} \wedge n = 1 \}$
- 4) List the mobile number whose Fname is Ankit.
 $\{ \langle m \rangle \mid \exists a (\langle a, m \rangle \in \text{Phone_No} \wedge \langle a, b, c, d, e, f \rangle \in \text{Person} \wedge F = \text{'Ankit'}) \}$
- 5) Find the arrival and departure time of train no= '12345', pin code='148101'.
 $\{ \langle a, d \rangle \mid \langle t, p, a, d, e \rangle \in \text{stopage} \wedge t = \text{'12340'} \wedge p = \text{'148101'} \}$
- 6) List train no. which are cancelled.
 $\{ \langle t \rangle \mid \langle t, n, p, s \rangle \in \text{train_no} \wedge s = \text{'cancelled'} \}$
- 7) List all female passengers.
 $\{ \langle f, m, l \rangle \mid \exists a ((\langle a, f, m, l, s, d \rangle) \in \text{person}) \wedge \langle s = \text{'female'} \rangle \wedge \langle a, p, t \rangle \in \text{passenger}) \}$
- 8) Find train_no which have AC coaches and have seats left>50.
 $\{ \langle t \rangle \mid \exists (t, s, a, b, d) \in \text{coaches} \wedge c = \text{'ac'} \wedge d > 50 \}$
- 9) Find name and type of train_no='786520'
 $\{ \langle n, p \rangle \mid \langle t, n, p, s \rangle \in \text{train_no} \wedge \text{train_no} = \text{'786420'} \}$
- 10) Find no. of platform on pincode='201304'
 $\{ \langle n \rangle \mid \langle p, c, n \rangle \in \text{station} \wedge p = \text{'201304'} \}$

TUPLE CALCULUS

1)List all train detail whose fair is greater than 1000

$\{t \mid \exists s \in \text{Fair} (t[\text{train_no}] = s[\text{train_no}] \wedge s[\text{rupees}] > 1000) \wedge \exists u \in \text{Train} (t[\text{train_no}] = u[\text{train_no}]) \}$

2)List all train details which goes from jalandhar to delhi

$\{t \mid \exists s \in \text{Ticket} (t[\text{train_no}] = s[\text{train_no}]) \}$

3)Find the details of trains in which seat left is zero

$(t \mid \exists s \in \text{coaches} (S[\text{Train_no}] = t[\text{train_no}] \wedge S[\text{Seats_left}] = 0) \wedge (\exists U \in \text{train} (U[\text{train_no}] = t[\text{train_no}])) \}$

4)List trains which are cancelled

$\{t \mid \exists t \in \text{train} (t[\text{status}] = \text{cancelled}) \}$

5)Find the aadhar number and passenger_id of passenger whose payment id is VK18IN

$\{t \mid \exists s \in \text{ticket} (s[\text{ticket_no}] = t[\text{ticket_no}] \wedge s[\text{ticket_no}] = \text{VK18N}) \wedge \exists U \in \text{passenger} (U[\text{ticket_no}] = t[\text{ticket_no}]) \}$

6)Find the station which have more than 4 platform

$\{t \mid \exists t \in \text{station} (t[\text{no_of_platform}] > 4) \}$

7)Find the passenger whose age is below 10

$\{t \mid \exists s \in \text{passenger} (t[\text{aadhar_no}] = s[\text{aadhar_no}] \wedge \exists U \in \text{person} (U[\text{aadhar_no}] = S[\text{aadhar_no}] \wedge U[\text{curr_Date} - \text{Dob}]$

8)Find the details of ticket which are confirmed

$\{t \mid \exists t \in \text{ticket} (t[\text{status}] = \text{confirmed}) \}$

9)Find the details train arriving on pincode 201304

$(t \mid \exists t \in \text{stopages} (t[\text{pincode}] = 213040) \wedge t[\text{date_of_arrival}] = \text{8th April}) \}$

10)List all person whose gender is female

$\{t \mid \exists t \in \text{Person} (t[\text{sex}] = \text{female}) \}$

Relational Algebra

1) Find the Passenger_Id and User_Id of passengers.

→ $\pi_{\text{Passenger_Id}, \text{User_Id}} (\sigma_{\text{Passenger.Aadhar_No}=\text{User.Aadhar_No}} (\text{Passenger} * \text{User}))$

2) Find type of seats and seat left for train departing after 4:00 Pm.

→ $\pi_{\text{Type}, \text{Seats_Left}} (\text{COACHES}) (\sigma_{\text{Departure_Time} > '4:00'} (\text{STOPAGE})) \bowtie_{\text{Stopage.Train_No}=\text{Coaches.Train_No}}$

3) Find the name of the person whose age is less than 15.

→ $\pi_{\text{F_Name}, \text{M_Name}, \text{L_Name}} (\text{PERSON}) (\sigma_{\text{year}(\text{current_date}) - \text{year}(\text{DOB}) < 15} (\text{PERSON}))$

4) Find Train no and status of all trains.

→ $\pi_{\text{Train_No}, \text{Status}} (\text{TRAIN})$

5) Find the Ticket No of passenger whose platform no is 5.

→ $\pi_{\text{Ticket_No}} (\text{TICKET}) (\sigma_{\text{Platform_No} = 5} (\text{TICKET}))$

6) Find the city name & no of platforms where a train is arriving at 1:00 PM.

→ $\pi_{\text{City_Name}, \text{No_Of_Platform}} (\text{STATION}) (\sigma_{\text{Arrival_Time} = '13:00'} (\text{STOPAGE})) \bowtie_{\text{Stopage.Pincode}=\text{Station.Pincode}}$

7) Find the Train No and its arrival and departure station having ticket rupees >1000.

→ $\pi_{\text{Train_No}, \text{from}, \text{To}} (\text{FARE}) (\sigma_{\text{Rupees} > 1000} (\text{FARE}))$

8) Retrieve the train_no. with no vacancy.

→ $\pi_{\text{Train_No}} (\text{COACHES}) (\sigma_{\text{seats_left}=0} (\text{COACHES}))$

9) Find the date of arrival of train no '123'.

→ $\pi_{\text{Date_Of_Arrival}} (\text{STOPAGE}) (\sigma_{\text{Train_No}=123} (\text{STOPAGE}))$

10) Find the fname of person having age <10 and age >70.

→ $\text{Result1} \leftarrow \pi_{\text{F_Name}} (\text{PERSON}) (\sigma_{\text{Age} < 10} (\text{PERSON}))$
 $\text{Result2} \leftarrow \pi_{\text{F_Name}} (\text{PERSON}) (\sigma_{\text{Age} > 70} (\text{PERSON}))$
 $\text{Result} \leftarrow \text{Result1} \cup \text{Result2}$

11) Retrieve the pincode and city name with no. of platforms greater than 3.

→ $\pi_{\text{Pincode}, \text{city}} (\text{STATION}) (\sigma_{\text{no.of_platforms} > 3} (\text{STATION}))$

12) Retrieve the aadhar no. and the ticket no. of passenger whose passenger id is 23455234.

→ $\pi_{\text{aadhar_no}, \text{ticket_no}} (\text{PASSENGER}) (\sigma_{\text{passenger_id}=23455234} (\text{PASSENGER}))$

13) Find details of train who passes by pincode -144801.

→ $\pi_{\text{Train_No}, \text{Name}, \text{Type}, \text{Status}} (\text{TRAIN}) (\sigma_{\text{Pincode}=144801} (\text{STOPAGE})) \bowtie_{\text{Stopage.Train_No}=\text{Train.Train_No}}$

14) Find the Userid of Aadhar No '2478767587'.

→ $\pi_{\text{User_Id}} (\text{USER}) (\sigma_{\text{Aadhar_No}='2478767587'} (\text{USER}))$

15) Find Passenger Id and Status of all passengers.

→ $\Pi_{\text{Passenger_Id, Status}}$ (PASSENGER)