Department of Computer Science and Engineering

Course code : CSE- 2201

Database Management Systems-I

2nd year 2nd Semester

Project Based lab on

Railway Management System

Submitted By

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Railway Management System

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Abstract

The Railway Management System facilitates the passengers to book tickets through agents as well as collect information regarding their booking status.The aim of this project is to design and develop a database maintaining the records of different trains, stations, passengers and agents. Furthermore, this project demonstrates Entity Relationship Diagram and Schema Diagram based on railway database reservation system. Examples of some SQL queries to retrieve data from rail management database have also been provided. Lastly, I have deduced xyz from abc and proved normalisation of the same.

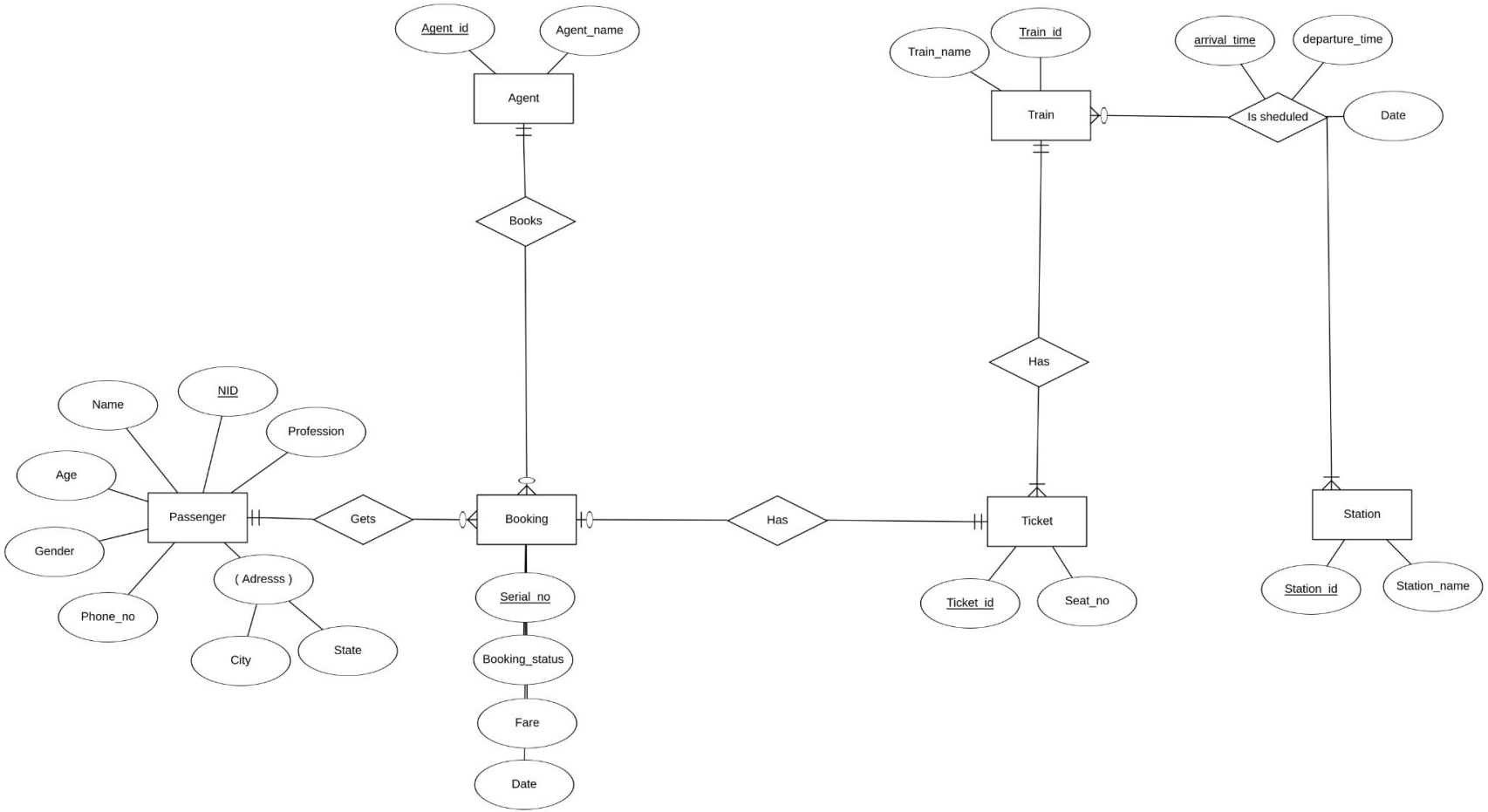
Project Description

- The main purpose of maintaining database of Railway management system is to reduce the manual errors involved in the booking and cancellation of tickets and make it convenient for the agents or passengers to check details of their tickets. It also retrieves data of passengers and makes it available for railway authority whenever required. Due to automation, many loopholes that exist in the manual maintenance of the records can be removed. The speed of obtaining and processing the data will be fast. For future expansion, the proposed system can be web enabled so that passengers can make various enquiries about trains between stations. Owing to different kinds of problems rising from manual maintenance, misinformed or misguided passengers often find themselves in difficult situations. To solve this problem, a database has been designed which includes passenger details, trains and their station details.
- This project aims to design and develop a database maintaining the records of booking information of different passengers, and schedules of different trains at different stations. The record of booking contains all the bookings that took place so far, where it contains the unique serial number of each booking, the IDs of agents who have booked the ticket/s, passengers' NIDs, ticket IDs, date of booking and ticket booking status -- whether it is confirmed or canceled. Booked tickets can also be cancelled, for which the unique serial no of booking and the ticket ID have to be provided. Accordingly, a ticket will be cancelled and the corresponding record will be deleted as well. Additionally, full details of the passenger and agent can easily be found if necessary. In the scheduled section, arrival and departure details of any train, such as the time of arrival/departure or the arrival/departure station, can be found. Since the reservation system has a large amount of data, it was not feasible to develop a the case study of the whole and prepare documentation of that level. Therefore, a small sample case study has been created for demonstration.

Entities	Attributes
1. Agent	• **Agent_id** • Agent name
2. Passenger	• **Nid** • Name • Gender • State • City • Age • Phone_no • Profession
3. Ticket	• **Ticket_id** • Train_id • Seat_no
4. Train	• **Train_id** • Train_name
5. Station	• **Station_id** • Station_name

Entities	Attributes
6- Booking	• **Serial_no** • Ticket_id • Nid • Agent's_id • Fare • Status • Date
7- Is_scheduled	• **Arrival_time** • Departure_time • Date • Station_id • Train_id

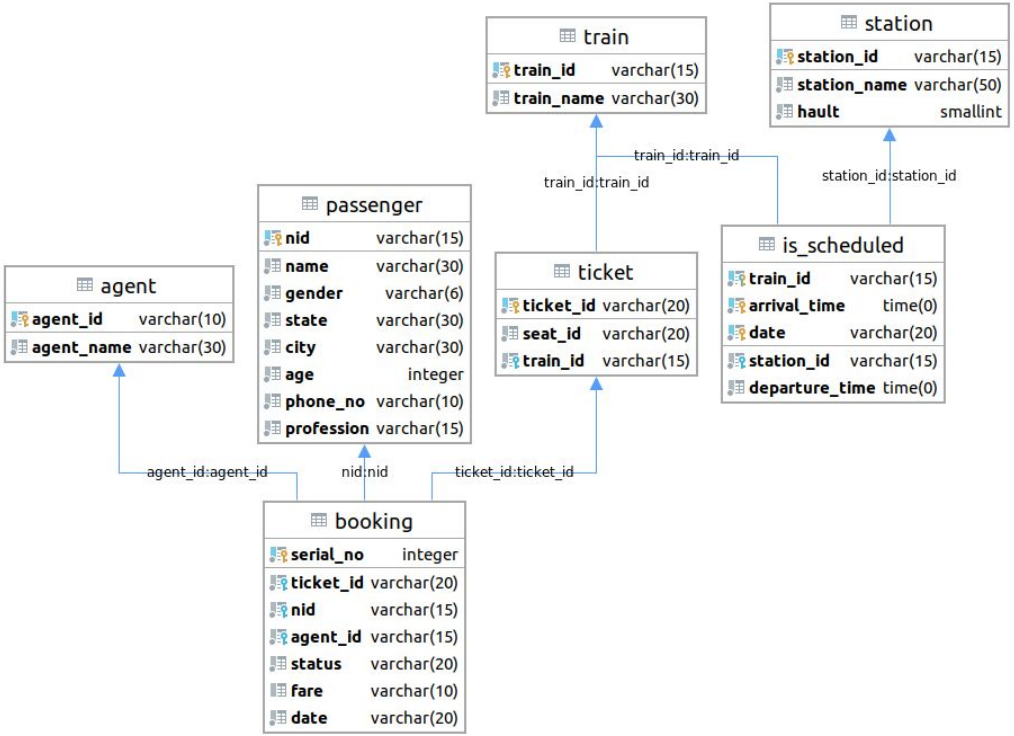
Entity Relationship (ER) Diagram



Final List of Relationships

1.	One to one →	• Between $Booking_{mandatory}$ and $Ticket_{optional}$
2.	One to many →	• Between $Agent_{optional}$ and $Booking_{mandatory}$ • Between $Passenger_{optional}$ and $Booking_{mandatory}$ • Between $Train_{mandatory}$ and $Ticket_{mandatory}$
3.	Many to many →	• Between $Train_{mandatory}$ and $Station_{optional}$

Schema Diagram



Create Table Queries

#Create Table Agent

```
CREATE TABLE Agent(
   Agent_id   int NOT NULL ,
   Agent_name varchar(30) NOT NULL ,
   PRIMARY KEY (Agent_id)
);
```

#Create Table Train

```
CREATE TABLE Train(
Train_id varchar(15) NOT NULL ,
Train_name varchar(30) NOT NULL ,
PRIMARY KEY (Train_id)
);
```

#Create Table Station

```
CREATE TABLE Station(
Station_id varchar(15) NOt NULL ,
Station_name varchar(50) NOT NULL,
HAULT int2 NOT NULL ,
  PRIMARY KE(Station_id)
);
```

#Create Table Passenger

```
CREATE TABLE Passenger(
   NID  varchar(15) NOT NULL,
   Name     varchar(30) NOT NULL ,
   Gender     varchar(6) NOT NULL,
   State    varchar(30) NOT NULL ,
   City     varchar(30) NOT NULL ,
   Age      int  NOT NULL ,
   Phone_no     varchar(10) NOT NULL ,
   Profession  varchar(15) NOT NULL ,
   PRIMARY KEY (NID)
);
```

#Create Table Booking

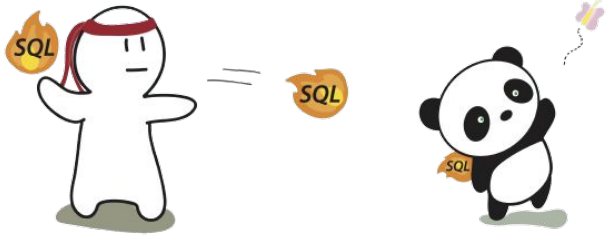
```
CREATE TABLE Booking(
  Serial_no int NOT NULL ,
  Ticket_id   varchar(20) NOT NULL ,
  NID  varchar(15) NOT NULL,
  Agent_id int NOT NULL,
  Status  varchar(20) NOT NULL ,
  Fare   int,
  date     varchar(20) NOT NULL ,
  PRIMARY KEY (Serial_no),
  FOREIGN KEY (NID) REFERENCES Passenger(NID),
   FOREIGN KEY(Agent_id) REFERENCES Agent(Agent_id),
  );
```

#Create Table To_Be_Scheduled

```
CREATE TABLE Is_Scheduled(
 Station_id varchar(15) NOT NULL ,
 Train_id  varchar(15) NOT NULL ,
 Departure_time   time(0)  NOT NULL ,
 Arrival_time   time(0)  NOT NULL ,
 Date     varchar(20) NOT NULL ,
   PRIMARY KE(Train_id,Date,Arrival_time),
  FOREIGN KE(Train_id) REFERENCES Train(Train_id),
  FOREIGN KE(Station_id) REFERENCES Station(Station_id)
  );
```

#Create Table Ticket

```
CREATE TABLE Ticket(
   Ticket_id   varchar(20) NOT NULL ,
   Seat_id varchar(20) NOT NULL ,
   Train_id  varchar(15) NOT NULL ,
   PRIMARY KEY (Ticket_id),
   FOREIGN KEY (Train_id) REFERENCES Train (Train_id)
);
```



#Insert into Table Passenger


```
INSERT INTO  Passenger VALUES  ('111 501','Syed Ameer Ali','M','Kashmir','Rajbagh',48,'9906783816','Teacher'),
                       ('112_502','Syed_Jahanaara_Ameer','F','Kashmir','Rajbagh',41,'9906799816','Teacher'),
                          ('113-503','Syed Aliya Ameer','F','Kashmir','Rajbagh',10,'7006894321','Student'),
                             ('114 504','Mehak Amin','F','Kashmir','Chanapoora',21,'9906987654','Student'),
                         ('115-505','Muskaan mushtaq','F','Kashmir','Hyderpora',21,'7006578910','Student'),
                            ('116 506','Zakriya Shabir','M','Jammu','Natipora',22,'7006543219','Student'),
                              ('117_507','Mueid_Bhat','M','Jammu','Ikhrakpora',22,'8807676743','Student'),
                              ('118 508','Imran Khan','M','Jammu','Ikhrajpora',22,'9906573213','Teacher'),
                              ('119 509','Hashmat Ali','M','Delhi','Nizamuddin',22,'9905673413','Doctor'),
                                ('120 510','Umer Latif','M','Jammu','Natipora',22,'9906978713','Teacher'),
                           ('121  511','Rahat Khurshid','F','Jammu','Nawakadal',22,'9906976521','Teacher'),
                              ('122-512','Adnaan_frooq','M','Delhi','Nizamuddin',21,'7006578910','Doctor'),
                                   ('123 513','Rashid Ali','M','Delhi','Agra',41,'7006555219','Engineer'),
                                ('124 514','Sameer Hamdani','M','Delhi','Agra',41,'9907676233','Engineer'),
                             ('125 515','Imran Zahid','M','Jammu','Ikhrajpora',41,'9906573213','Engineer'),
                                     ('126 516','Ashmeen','F','Delhi','Gudgaon',41,'9902974712','Doctor'),
                                ('127_517','Mehreen','M','Jammu','Ikhrajpora',22,'9906573213','Engineer'),
                                ('128 518','Tahmid Ali','M','Delhi','Nizamuddin',48,'9905673413','Doctor'),
                           ('129 519','Sameena Nasir','F','Kashmir','Chanapoora',21,'7006987654','Student'),
                            ('130-520','Mehar mushtaq','F','Kolkatta','Ichapur',21,'9906578910','Engineer'),
                                 ('131 521','Ritu Kaur','F','Kolkatta','Shibpur',48,'7006676743','Doctor'),
                                ('132_522','Meenakshi','F','Kolkatta','Shibpur',48,'7006573213','Teacher'),
                              ('133 523','Kaur Amita','M','Kolkatta','Ichapur',22,'9906543219','Engineer'),
                                   ('134 524','Nayeem','M','Kolkatta','Ichapur',54,'8806342154','Engineer'),
                             ('135 525','Hayat Hamdani','F','Kolkatta','Shibpur',76,'7006789213','Doctor'),
                                          ('136 526','Rafid','M','Delhi','Agra',7,'7006676743','Student'),
                                    ('137_527','Noman','M','Jammu','Natipora',5,'7006573213','Student'),
                                  ('138 528','Tahrim','M','Kashmir','Nowhatta',9,'9906543219','Student'),
                                          ('139 529','Adnan','M','Delhi','Agra',8,'8806342154','Student'),
                                   ('140 530','Turno','M','Kolkatta','Shibpur',6,'7006789213','Student'),
                                   ('141 531','Tuba','F','Mumbai','Kapadianagar',32,'700632145','Nurse'),
                                  ('142_532','Tasnim','F','Mumbai','Indiranagar',56,'7006875432','Nurse'),
                                ('143 533','Prodipto','M','Mumbai','Indiranagar',6,'7006343154','Student'),
                                   ('144 534','Imu','M','Mumbai','Kapadianagar',5,'880643215','Student'),
                                  ('145 535','Tareq','M','Mumbai','Indiranagar',31,'7006111232','Actor'),
                                    ('146 536','Rizwan','M','Jammu','Natipora',34,'8806343434','Actor'),
                                ('147_537','Robiul','M','Kolkatta','Madhunagar',43,'8806454545','Driver'),
                                          ('148 538','ela','F','Delhi','Agra',36,'8806565656','Scientist'),
                                    ('149 539','tahmid','M','Delhi','Agra',46,'8806676767','Scientist');
```

Insert into table queries

#Insert into Table Agent

```
INSERT INTO  Agent VALUES        (1500,'Nashmin Nawar'),(1550,'Naima Hasan'),(1590,'Tahmid Imtiaz'),
                                 (1600,'Tahmid Mahin'),(1650,'Imran Zahid'),(1690,'Azwad Hossain'),
                          (1700,'Fawwaz_Amin'),(1750,'Abdullah'),(1800,'Jahir_Monon'),(1850,'Kabbo');
```

#Insert into Table Station

```
INSERT INTO  Station VALUES ('555201','Srinagar station',2),('555202','Jammu station',5),
                            ('555203','New Delhi station',7),('555204','Howrah station',9),
                            ('555205','Sealdah station',11),('555206','Kulgam station',14),
                            ('555207','Jammu stattion',2),('555208','Srinagar station',5),
                            ('555209','New Delhi station',7),('555210','Howrah station',9),
                            ('555211','Sealdah station',1),('555212','Kulgam station',14);
```

#Insert into Table Ticket

```
INSERT INTO Ticket VALUES       ('A 1111','A 11','82801'),('B 1112','B 12','82812'),('C 1113','C 13','82823'),
                                ('D 1114','D 14','82834'),('E 1115','E 15','82801'),('F 1116','F 16','82801'),
                                ('G 1117','G 17','82801'),('H 1118','H 18','82801'),('I 1119','I 19','82801'),
                                ('A 2115','A 15','82845'),('B 2116','B 16','82856'),('C 2117','C 17','82801'),
                                ('D 2118','D 18','82812'),  ('E 2119','E 19','82812'),('F 2120','F 2O','82813'),
                                ('G 2121','G 21','82812'),('H 2122','H 22','82813'),('I 2123','I 23','82812'),
                                ('A 3119','A 19','82823'),('B 3120','B 20','82845'),('C 3121','C 21','82845'),
                                ('D 3122','D 22','82856'),('E 3123','E 23','82823'),('F 3124','F 24','82824'),
                                ('G 3125','G 25','82823'),('H 3126','H 26','82824'),('I 3127','I 27','82823'),
                                ('A 4123','A 23','82812'),('B 4124','B 24','82813'),('C 4125','C 25','82824'),
                                ('D 4126','D 26','82835'),('E 4127','E 27','82834'),('F 4128','F 28','82835'),
                                ('G 4129','G 29','82834'),('H 4130','H 30','82835'),('I 4131','I 31','82834'),
                                ('A 4127','A 27','82846'),('B 4128','B 28','82857'),('C 4129','C 29','82812'),
                                ('D 4130','D 30','82813'),('E 4131','E 31','82812'),('F 4132','F 32','82801'),
                                ('G 4133','G 33','82812'),('H 4134','H 34','82801'),('I 4135','I 35','82812'),
                                ('A 5131','A 31','82824'),('B 5132','B 32','82835'),('C 5133','C 33','82846'),
                                ('D 5134','D 34','82857'),('E 5134','E 35','82801'),('F 5134','F 36','82835'),
                                ('G 5134','G 37','82801'),('H 5134','H 38','82834'),('I 5134','I 39','82801');
```

#Insert into Train Table

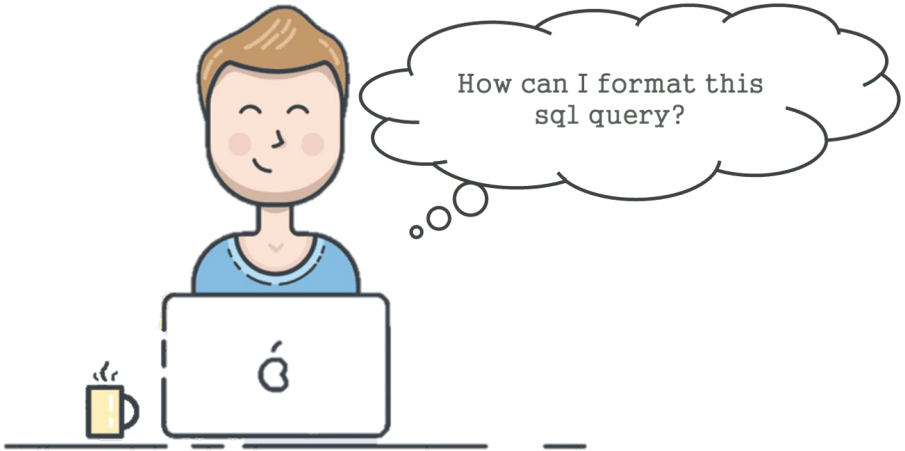
```
INSERT INTO  Train VALUES             ('82801','SAFFRON EXPRESS'),('82812','JAMMU TAWI'),('82823','RAJHDANI EXPRESS'),
                                ('82834','HOWRAH EXPRESS'),('82845','SUVIDHA SPECIAL'),('82856','PURNIMA EXPRESS'),
                           ('88802','ANDHRA PRADESH EXPRESS'),('82813','CHARMINAR EXPRESS'),('82824','CHENNAI EXPRESS'),
                                ('82835','POORNA EXPRESS'),('82846','STELL EXPRESS'),('82857','SHIV EXPRESS');
```

#Insert into Table Booking

```
INSERT INTO Booking VALUES     (1,'A 1111','111 501',1500,'B',1500,'01-01-19'),(2,'B 1112','112 502',1500,'B',1500,'02-01-20'),
                                (3,'C 1113','113-503',1500,'B',500,'05-02-21'),(4,'D 1114','114 504',1500,'B',1500,'08-02-19'),
                               (5,'E 1115','115-505',1550,'B',1500,'21-02-21'),(6,'F 1116','116 506',1550,'B',1500,'11-03-20'),
                               (7,'G 1117','117 507',1550,'B',1500,'02-04-21'),(8,'H 1118','118 508',1550,'B',1500,'07-01-21'),
                             (9,'I 1119','119 509',1590,'B',1500,'01-01-21'),(10,'A 2115','120 510',1590,'B',1500,'21-02-21'),
                           (11,'B 2116','121 511',1590,'B',1500,'09-01-21'),(12,'C 2117','122-512',1590,'B',1550,'11-03-21'),
                           (13,'D 2118','123 513',1600,'B',1600,'11-03-21'),(14,'E 2119','124 514',1600,'B',1600,'05-02-21'),
                           (15,'F 2120','125 515',1600,'B',1600,'08-02-20'),(16,'G 2121','126 516',1600,'B',1600,'11-03-21'),
                           (17,'H 2122','127 517',1650,'B',1600,'02-04-21'),(18,'I 2123','128 518',1650,'B',1600,'01-01-21'),
                           (19,'A 3119','129 519',1650,'B',1600,'03-04-21'),(20,'B 3120','130-520',1650,'B',1600,'08-02-19'),
                           (21,'C 3121','131 521',1690,'B',1600,'21-02-21'),(22,'D 3122','132 522',1690,'B',1600,'11-03-21'),
                           (23,'E 3123','133 523',1690,'B',1600,'05-04-21'),(24,'F 3124','134 524',1690,'B',1600,'25-02-20'),
                            (25,'G 3125','135 525',1700,'B',1750,'02-01-21')(26,'H 3126','136 526',1700,'B',500,'11-03-21'),
                            (27,'I 3127','137 527',1700,'B',500,'03-04-21'),(28,'A 4123','138 528',1700,'B',500,'11-03-21'),
                            (29,'B 4124','139 529',1750,'B',500,'01-01-21'),(30,'C 4125','140 530',1750,'B',500,'08-02-21'),
                           (31,'D 4126','141 531',1750,'B',1750,'02-01-21'),(32,'E 4127','142 532',1750,'B',1750,'02-04-21'),
                            (33,'F 4128','143 533',1800,'B',500,'07-01-21'),(34,'G 4129','144 534',1800,'B',500,'21-01-21'),
                           (35,'H 4130','145 535',1800,'B',1800,'03-01-21'),(36,'I 4131','146 536',1800,'B',1800,'02-04-21'),
                           (37,'A 4127','147 537',1850,'B',1800,'05-02-21'),(38,'B 4128','148 538',1850,'B',1800,'21-02-21'),
                           (39,'C 4129','149 539',1850,'B',1800,'02-04-21'),(40,'D 4130','111 501',1850,'C',1800,'07-03-21'),
                            (41,'E 4131','112 502',1500,'C',1500,'02-01-21'),(42,'F 4132','113-503',1500,'C',500,'11-03-21'),
                           (43,'G 4133','114 504',1550,'C',1500,'02-04-19'),(44,'H 4134','115-505',1550,'C',1500,'07-01-21'),
                           (45,'I 4135','116 506',1590,'C',1500,'02-01-20'),(46,'A 5131','117 507',1590,'C',1500,'08-02-21'),
                            (47,'B 5132','118 508',1600,'C',1600,'21-02-21')(48,'C 5133','119 509',1600,'C',1600,'02-01-20'),
                           (49,'D 5134','120 510',1650,'C',1600,'11-03-21'),(50,'E 5134','121 511',1650,'C',1600,'07-01-21'),
                           (51,'F 5134','122-512',1700,'C',1750,'28-02-21'),(52,'G 5134','123 513',1700,'C',1700,'05-02-19'),
                            (53,'H 5134','124 514',1750,'C',1700,'02-04-21' (54,'I 5134','125 515',1750,'C',1700,'21-02-21');
```

#Insert into Is_Scheduled Table

```
INSERT into  Is Scheduled  values('555202','82812','06:00','13:00','01-05-21'),('555203','82823','06:30','14:30','02-05-21'),
                                 ('555204','82834','07:00','15:00','04-05-21'),('555205','82845','07:30','16:30','09-06-21'),
                                 ('555206','82856','08:00','17:00','17-06-21'),('555207','88802','08:30','18:30','25-07-21'),
                                 ('555208','82813','09:00','19:00','09-06-21'),('555209','82824','09:30','20:30','17-06-21'),
                                 ('555210','82835','10:00','21:00','09-06-21'),('555211','82846','10:30','22:30','25-07-21'),
                                 ('555212','82857','11:00','23:00','09-06-21'),('555201','82801','11:30','23:30','17-06-21'),
                                 ('555202','82812','06:00','13:00','02-05-21'),('555203','82823','06:30','14:30','01-05-21'),
                                 ('555204','82834','07:00','15:00','02-05-21'),('555205','82845','07:30','16:30','01-05-21'),
                                 ('555206','82856','08:00','17:00','02-05-21'),('555207','88802','08:30','18:30','02-05-21'),
                                 ('555208','82813','09:00','19:00','08-06-21'),('555209','82824','09:30','20:30','25-07-21'),
                                 ('555210','82835','10:00','21:00','25-07-21'),('555211','82846','10:30','22:30','02-05-21'),
                                 ('555212','82857','11:00','23:00','17-06-21'),('555201','82801','11:30','23:30','09-06-21');
```



Snapshots of Tables

Agent Table

	agent_id	agent_name
1	1500	Nashmin_Nawar
2	1550	Naima_Hasan
3	1590	Tahmid_Imtiaz
4	1600	Tahmid_Mahin
5	1650	Imran_Zahid
6	1690	Azwad_Hossain
7	1700	Fawwaz_Amin
8	1750	Abdullah
9	1800	Jahir_Monon
10	1850	Kabbo

Station Table

	station_id	station_name	hault
1	555201	Srinagar_station	2
2	555202	Jammu_station	5
3	555203	New_Delhi_station	7
4	555204	Howrah_station	9
5	555205	Sealdah_station	11
6	555206	Kulgam_station	14
7	555207	Jammu_stattion	2
8	555208	Srinagar_station	5
9	555209	New_Delhi_station	7
10	555210	Howrah_station	9
11	555211	Sealdah_station	1
12	555212	Kulgam_station	14

Is_Scheduled Table

	station_id	train_id	departure_time	arrival_time	date
1	555202	82812	06:00:00	13:00:00	01-05-21
2	555203	82823	06:30:00	14:30:00	02-05-21
3	555204	82834	07:00:00	15:00:00	04-05-21
4	555205	82845	07:30:00	16:30:00	09-06-21
5	555206	82856	08:00:00	17:00:00	17-06-21
6	555207	88802	08:30:00	18:30:00	25-07-21
7	555208	82813	09:00:00	19:00:00	09-06-21
8	555209	82824	09:30:00	20:30:00	17-06-21
9	555210	82835	10:00:00	21:00:00	09-06-21
10	555211	82846	10:30:00	22:30:00	25-07-21
11	555212	82857	11:00:00	23:00:00	09-06-21
12	555201	82801	11:30:00	23:30:00	17-06-21
13	555202	82812	06:00:00	13:00:00	02-05-21
14	555203	82823	06:30:00	14:30:00	01-05-21
15	555204	82834	07:00:00	15:00:00	02-05-21
16	555205	82845	07:30:00	16:30:00	01-05-21
17	555206	82856	08:00:00	17:00:00	02-05-21
18	555207	88802	08:30:00	18:30:00	02-05-21
19	555208	82813	09:00:00	19:00:00	08-06-21
20	555209	82824	09:30:00	20:30:00	25-07-21
21	555210	82835	10:00:00	21:00:00	25-07-21
22	555211	82846	10:30:00	22:30:00	02-05-21
23	555212	82857	11:00:00	23:00:00	17-06-21
24	555201	82801	11:30:00	23:30:00	09-06-21

Train Table

	train_id	train_name
1	82801	SAFFRON_EXPRESS
2	82812	JAMMU_TAWI
3	82823	RAJHDANI_EXPRESS
4	82834	HOWRAH_EXPRESS
5	82845	SUVIDHA_SPECIAL
6	82856	PURNIMA_EXPRESS
7	88802	ANDHRA_PRADESH_EXPRESS
8	82813	CHARMINAR_EXPRESS
9	82824	CHENNAI_EXPRESS
10	82835	POORNA_EXPRESS
11	82846	STELL_EXPRESS
12	82857	SHIV_EXPRESS

Ticket Table

	ticket_id	seat_id	train_id
1	A_1111	A_11	82801
2	B_1112	B_12	82812
3	C_1113	C_13	82823
4	D_1114	D_14	82834
5	E_1115	E_15	82801
6	F_1116	F_16	82801
7	G_1117	G_17	82801
8	H_1118	H_18	82801
9	I_1119	I_19	82801
10	A_2115	A_15	82845
11	B_2116	B_16	82856
12	C_2117	C_17	82801
13	D_2118	D_18	82812
14	E_2119	E_19	82812
15	F_2120	F_20	82813
16	G_2121	G_21	82812
17	H_2122	H_22	82813
18	I_2123	I_23	82812
19	A_3119	A_19	82823
20	B_3120	B_20	82845
21	C_3121	C_21	82845
22	D_3122	D_22	82856
23	E_3123	E_23	82823
24	F_3124	F_24	82824
25	G_3125	G_25	82823
26	H_3126	H_26	82824
27	I_3127	I_27	82823
28	A_4123	A_23	82812
29	B_4124	B_24	82813
30	C_4125	C_25	82824

Snapshots of Tables

Passenger Table

	nid	name	gender	state	city	age	phone_no	profession
1	111_501	Syed_Ameer_Ali	M	Kashmir	Rajbagh	48	9986783816	Teacher
2	112_502	Syed_Jahanaara_Ameer	F	Kashmir	Rajbagh	41	9986799816	Teacher
3	113-503	Syed_Aliya_Ameer	F	Kashmir	Rajbagh	10	7006894321	Student
4	114_504	Mehak_Amin	F	Kashmir	Chanapoora	21	9986987654	Student
5	115-505	Muskaan_mushtaq	F	Kashmir	Hyderpora	21	7006578910	Student
6	116_506	Zakriya_Shabir	M	Jammu	Natipora	22	7006543219	Student
7	117_507	Mueid_Bhat	M	Jammu	Ikhrakpora	22	8807676743	Student
8	118_508	Imran_Khan	M	Jammu	Ikhrajpora	22	9986573213	Teacher
9	119_509	Hashmat_Ali	M	Delhi	Nizamuddin	22	9985673413	Doctor
10	120_510	Umer_Latif	M	Jammu	Natipora	22	9986978713	Teacher
11	121_511	Rahat_Khurshid	F	Jammu	Nawakadal	22	9986976521	Teacher
12	122-512	Adnaan_frooq	M	Delhi	Nizamuddin	21	7006578910	Doctor
13	123_513	Rashid_Ali	M	Delhi	Agra	41	7006555219	Engineer
14	124_514	Sameer_Hamdani	M	Delhi	Agra	41	9987676233	Engineer
15	125_515	Imran_Zahid	M	Jammu	Ikhrajpora	41	9986573213	Engineer
16	126_516	Ashmeen	F	Delhi	Gudgaon	41	9982974712	Doctor
17	127_517	Mehreen	M	Jammu	Ikhrajpora	22	9986573213	Engineer
18	128_518	Tahmid_Ali	M	Delhi	Nizamuddin	48	9985673413	Doctor
19	129_519	Sameena_Nasir	F	Kashmir	Chanapoora	21	7006987654	Student
20	130-520	Mehar_mushtaq	F	Kolkatta	Ichapur	21	9986578910	Engineer
21	131_521	Ritu_Kaur	F	Kolkatta	Shibpur	48	7006676743	Doctor
22	132_522	Meenakshi	F	Kolkatta	Shibpur	48	7006573213	Teacher
23	133_523	Kaur_Amita	M	Kolkatta	Ichapur	22	9986543219	Engineer
24	134_524	Nayeem	M	Kolkatta	Ichapur	54	8806342154	Engineer
25	135_525	Hayat_Hamdani	F	Kolkatta	Shibpur	76	7006789213	Doctor
26	136_526	Rafid	M	Delhi	Agra	7	7006676743	Student
27	137_527	Noman	M	Jammu	Natipora	5	7006573213	Student
28	138_528	Tahrim	M	Kashmir	Nowhatta	9	9986543219	Student
29	139_529	Adnan	M	Delhi	Agra	8	8806342154	Student
30	140_530	Turno	M	Kolkatta	Shibpur	6	7006789213	Student
31	141_531	Tuba	F	Mumbai	Kapadianagar	32	700632145	Nurse
32	142_532	Tasnim	F	Mumbai	Indiranagar	56	7006875432	Nurse
33	143_533	Prodipto	M	Mumbai	Indiranagar	6	7006343154	Student

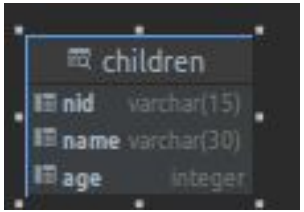
Booking Table

	serial_no	ticket_id	nid	agent_id	status	fare	date
1	1	A_1111	111_501	1500	B	1500	01-01-19
2	2	B_1112	112_502	1500	B	1500	02-01-20
3	3	C_1113	113-503	1500	B	500	05-02-21
4	4	D_1114	114_504	1500	B	1500	08-02-19
5	5	E_1115	115-505	1550	B	1500	21-02-21
6	6	F_1116	116_506	1550	B	1500	11-03-20
7	7	G_1117	117_507	1550	B	1500	02-04-21
8	8	H_1118	118_508	1550	B	1500	07-01-21
9	9	I_1119	119_509	1590	B	1500	01-01-21
10	10	A_2115	120_510	1590	B	1500	21-02-21
11	11	B_2116	121_511	1590	B	1500	09-01-21
12	12	C_2117	122-512	1590	B	1550	11-03-21
13	13	D_2118	123_513	1600	B	1600	11-03-21
14	14	E_2119	124_514	1600	B	1600	05-02-21
15	15	F_2120	125_515	1600	B	1600	08-02-20
16	16	G_2121	126_516	1600	B	1600	11-03-21
17	17	H_2122	127_517	1650	B	1600	02-04-21
18	18	I_2123	128_518	1650	B	1600	01-01-21
19	19	A_3119	129_519	1650	B	1600	03-04-21
20	20	B_3120	130-520	1650	B	1600	08-02-19
21	21	C_3121	131_521	1690	B	1600	21-02-21
22	22	D_3122	132_522	1690	B	1600	11-03-21
23	23	E_3123	133_523	1690	B	1600	05-04-21
24	24	F_3124	134_524	1690	B	1600	25-02-20
25	25	G_3125	135_525	1700	B	1750	02-01-21
26	26	H_3126	136_526	1700	B	500	11-03-21
27	27	I_3127	137_527	1700	B	500	03-04-21
28	28	A_4123	138_528	1700	B	500	11-03-21
29	29	B_4124	139_529	1750	B	500	01-01-21
30	30	C_4125	140_530	1750	B	500	08-02-21
31	31	D_4126	141_531	1750	B	1750	02-01-21
32	32	E_4127	142_532	1750	B	1750	02-04-21
33	33	F_4128	143_533	1800	B	500	07-01-21
34	34	G_4129	144_534	1800	B	500	21-01-21
35	35	H_4130	145_535	1800	B	1800	03-01-21

CREATE VIEWS

1. Create a view named Children where age is less than 11

```
CREATE VIEW Children AS
SELECT nid,name, age
FROM  passenger where age <11;
```

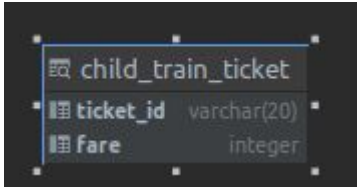


2. Create a view named Doctor where profession = ‘Doctor’

```
CREATE VIEW Doctor AS
SELECT *
FROM  passenger where Profession = 'Doctor';
```

3. Create a view named Child_train_ticket where fare is less than 1000

```
CREATE VIEW Child_train_ticket AS
     SELECT  Ticket_id,fare
  FROM  booking where fare < 1000;
```



SQL QUERIES RELATED TO PROJECT GENERATION

1. Print Agent Id and name of all those agents who booked ticket for train “Saffron Express”

```
SELECT Agent_id,Agent_name from agent natural join
booking natural join ticket natural join Train where
Train_id = '82801' and Train_name = 'SAFFRON_EXPRESS'
and Agent_id = Booking.Agent_id;
```

	agent_id	agent_name
1	1500	Nashmin_Nawar
2	1550	Naima_Hasan
3	1550	Naima_Hasan
4	1550	Naima_Hasan
5	1550	Naima_Hasan
6	1590	Tahmid_Imtiaz
7	1590	Tahmid_Imtiaz
8	1500	Nashmin_Nawar
9	1550	Naima_Hasan
10	1650	Imran_Zahid
11	1700	Fawwaz_Amin
12	1750	Abdullah

Relational Algebra

$$\Pi_{Agent\_id,Agent\_name}\ (\sigma_{Train\_id = '82801' \wedge Train\_name = 'SAFFRON\_EXPRESS'}(agent)_{Agent\_id = Booking.Agent\_id)} \bowtie$$

$$(booking)_{booking.ticket\_id = ticket.ticketid} \bowtie (ticket) \bowtie (Train)$$

2. Generate all the train names that are possibly going through “New Delhi Station(555209)”

```
SELECT Train_name,Station_name
from station cross join train where Station_id ='555209';
```

Relational Algebra

$\Pi_{Train\_name,Station\_name}$

((station) **X** $_{Station\_id = '555209'}$ (train)

	train_name	station_name
1	SAFFRON_EXPRESS	New_Delhi_station
2	JAMMU_TAWI	New_Delhi_station
3	RAJHDANI_EXPRESS	New_Delhi_station
4	HOWRAH_EXPRESS	New_Delhi_station
5	SUVIDHA_SPECIAL	New_Delhi_station
6	PURNIMA_EXPRESS	New_Delhi_station
7	ANDHRA_PRADESH_EXPRESS	New_Delhi_station
8	CHARMINAR_EXPRESS	New_Delhi_station
9	CHENNAI_EXPRESS	New_Delhi_station
10	POORNA_EXPRESS	New_Delhi_station
11	STELL_EXPRESS	New_Delhi_station
12	SHIV_EXPRESS	New_Delhi_station

3. Print details of all booking that are booked by agent = ‘1550’

```
select b.Agent_id,Agent_name,Ticket_id,Status,nid from agent join
booking b on Agent.Agent_id = b.agent_id and b.Agent_id = '1550';
```

Relational Algebra

$\Pi_{b.Agent\_id,Agent\_name,Ticket\_id,Status,nid}$ ($\sigma_{b.Agent\_id='1550'}$ (agent) $\bowtie_{Agent.Agent\_id = b.agent\_id}$ (booking))

	agent_id	agent_name	ticket_id	status	nid
1	1550	Naima_Hasan	E_1115	B	115-505
2	1550	Naima_Hasan	F_1116	B	116_506
3	1550	Naima_Hasan	G_1117	B	117_507
4	1550	Naima_Hasan	H_1118	B	118_508
5	1550	Naima_Hasan	G_4133	C	114_504
6	1550	Naima_Hasan	H_4134	C	115-505

SQL QUERIES RELATED TO PROJECT GENERATION

4. Print details of passenger that are travelling under ticket no = 'F_4132'

```
select *from passenger join booking
using (nid) where Ticket_id ='F_4132';
```

Relational Algebra

$$\Pi_{nid,name,gender,state,city,age,phone\_no,profession,serialno,ticket\_id,agent\_id,status,fare,date}((passenger) \bowtie_{Ticket\_id = 'F\_4132',} (booking)$$

	nid	name	gender	state	city	age	phone_no	profession	serial_no	ticket_id	agent_id	status	fare	date
1	113-503	Syed_Aliya_Ameer	F	Kashmir	Rajbagh	10	7006894321	Student	42	F_4132	1500	C	500	11-03-21

5. Print schedule of those trains that reach station no = '555211'

```
SELECT * FROM  is_scheduled where Station_id= SOME
(SELECT Station_id FROM Is_Scheduled
WHERE Station_id = '555211');
```

Relational Algebra

$$\Pi_{station\_id,train\_id,departure\_time,arrival\_time,date}(\sigma_{station\_id='555211',})(is\_sheduled)$$

	station_id	train_id	departure_time	arrival_time	date
1	555211	82835	10:30:00	22:30:00	25-07-21
2	555211	82823	06:30:00	14:30:00	01-05-21
3	555211	82846	10:30:00	22:30:00	02-05-21

SQL QUERIES RELATED TO PROJECT GENERATION

6. Print Arrival time at which Train no ‘82835’ will reach station no ‘555211’

```
SELECT Arrival_time FROM  is_scheduled
)
WHERE Station_id = '555211' and Train_id = '82835';
```

Relational Algebra

$\Pi_{\text{Arrival\_time}} (\sigma \text{ station\_id} = \text{‘555211’} \wedge \text{Train\_id} = \text{‘828345’ (is\_sheduled)}$

	arrival_time
1	22:30:00

7. Print details of passengers whose age is greater than 50 order by age

```
SELECT  NID,Name,age
FROM passenger GROUP BY NID
HAVING  age > 50
order by age;
```

Relational Algebra

$\mathbf{T}_{\text{age}} ({}_{\text{nid}}\Im (\Pi_{\text{Nid,Name,age}} (\sigma_{(\text{age}>50)} (\text{passenger}))$

	nid	name	age
1	134_524	Nayeem	54
2	142_532	Tasnim	56
3	135_525	Hayat_Hamdani	76

8. Print details of all passengers that are travelling in train no = ‘82835’

```
select *
from passenger join booking using (nid)
join  Ticket using (Ticket_id) where Train_id ='82812';
```

- **Relational Algebra**

$$\Pi_{\text{nid,name,gender,state,city,age,phone\_no,profession}}(\sigma_{\text{Train\_id = ‘82812}}, (\text{passenger}) \bowtie (\text{booking}) \bowtie \text{Ticket})$$

	nid	name	gender	state	city	age ▲ 1	phone_no	profession
1	138_528	Tahrim	M	Kashmir	Nowhatta	9	9906543219	Student
2	114_504	Mehak_Amin	F	Kashmir	Chanapoora	21	9906987654	Student
3	116_506	Zakriya_Shabir	M	Jammu	Natipora	22	7006543219	Student
4	112_502	Syed_Jahanaara_Ameer	F	Kashmir	Rajbagh	41	9906799816	Teacher
5	123_513	Rashid_Ali	M	Delhi	Agra	41	7006555219	Engineer
6	124_514	Sameer_Hamdani	M	Delhi	Agra	41	9907676233	Engineer
7	126_516	Ashmeen	F	Delhi	Gudgaon	41	9902974712	Doctor
8	112_502	Syed_Jahanaara_Ameer	F	Kashmir	Rajbagh	41	9906799816	Teacher
9	149_539	tahmid	M	Delhi	Agra	46	8806676767	Scientist
10	128_518	Tahmid_Ali	M	Delhi	Nizamuddin	48	9905673413	Doctor

9. Print details of passengers whose profession is student order by age

```
SELECT *,char_length('Student')
from passenger where Profession = 'Student'
order by Age;
```

Relational Algebra

$$T_{age}\ (\Pi_{nid,name,gender,state,city,age,phone\_no,profession,char\_length(Student)}\ (\sigma_{Profession\ =\ 'Student'}\ (passenger)))$$

	nid	name	gender	state	city	age	phone_no	profession	char_length
1	137_527	Noman	M	Jammu	Natipora	5	7006573213	Student	7
2	144_534	Imu	M	Mumbai	Kapadianagar	5	880643215	Student	7
3	143_533	Prodipto	M	Mumbai	Indiranagar	6	7006343154	Student	7
4	140_530	Turno	M	Kolkatta	Shibpur	6	7006789213	Student	7
5	136_526	Rafid	M	Delhi	Agra	7	7006676743	Student	7
6	139_529	Adnan	M	Delhi	Agra	8	8806342154	Student	7
7	138_528	Tahrim	M	Kashmir	Nowhatta	9	9906543219	Student	7
8	113-503	Syed_Aliya_Ameer	F	Kashmir	Rajbagh	10	7006894321	Student	7
9	114_504	Mehak_Amin	F	Kashmir	Chanapoora	21	9906987654	Student	7
10	115-505	Muskaan_mushtaq	F	Kashmir	Hyderpora	21	7006578910	Student	7
11	129_519	Sameena_Nasir	F	Kashmir	Chanapoora	21	7006987654	Student	7
12	117_507	Mueid_Bhat	M	Jammu	Ikhrakpora	22	8807676743	Student	7
13	116_506	Zakriya_Shabir	M	Jammu	Natipora	22	7006543219	Student	7

10. Print details of passengers who cancelled tickets order by age

```
select passenger.*,Status,ASCII('C')
from passenger join booking b on
Passenger.NID = b.nid and Status = 'C'
Order by Age;
```

Relational Algebra

$$T_{age}\left(\Pi_{nid,name,gender,state,city,age,phone\_no,profession,status,ASCII('C')}\left(\sigma_{Status='C'}(passenger) \bowtie_{Passenger.NID = b.nid} (booking)\right)\right)$$

	nid	name	gender	state	city	age	phone_no	profession	status	ascii
1	113-503	Syed_Aliya_Ameer	F	Kashmir	Rajbagh	10	7006894321	Student	C	67
2	114_504	Mehak_Amin	F	Kashmir	Chanapoora	21	9906987654	Student	C	67
3	115-505	Muskaan_mushtaq	F	Kashmir	Hyderpora	21	7006578910	Student	C	67
4	122-512	Adnaan_frooq	M	Delhi	Nizamuddin	21	7006578910	Doctor	C	67
5	119_509	Hashmat_Ali	M	Delhi	Nizamuddin	22	9905673413	Doctor	C	67
6	121_511	Rahat_Khurshid	F	Jammu	Nawakadal	22	9906976521	Teacher	C	67
7	120_510	Umer_Latif	M	Jammu	Natipora	22	9906978713	Teacher	C	67
8	116_506	Zakriya_Shabir	M	Jammu	Natipora	22	7006543219	Student	C	67
9	117_507	Mueid_Bhat	M	Jammu	Ikhrakpora	22	8807676743	Student	C	67
10	118_508	Imran_Khan	M	Jammu	Ikhrajpora	22	9906573213	Teacher	C	67
11	125_515	Imran_Zahid	M	Jammu	Ikhrajpora	41	9906573213	Engineer	C	67
12	112_502	Syed_Jahanaara_Ameer	F	Kashmir	Rajbagh	41	9906799816	Teacher	C	67
13	123_513	Rashid_Ali	M	Delhi	Agra	41	7006555219	Engineer	C	67
14	124_514	Sameer_Hamdani	M	Delhi	Agra	41	9907676233	Engineer	C	67
15	111_501	Syed_Ameer_Ali	M	Kashmir	Rajbagh	48	9906783816	Teacher	C	67

11. Calculate the average fare from all bookings

Relational Algebra

```
SELECT avg(fare)
from booking;
```

$\Pi_{avg(fare)}$ (booking)

	avg
1	1426.8518518518519

12. Display Passenger's NID,name,age and ticket id who are paying less fare than the average Fare

Relational Algebra

```
with booked(averagefare) as (select avg(fare)
from booking)select p.NID,Name,age,Ticket id
from booking join passenger p on
Booking.NID = p.nid,booked where
booking.fare < booked.averagefare
ORDER BY age;
```

$T_{age}(\Pi_{p.nid,Name,Ticket\_id}(\rho x (average\ fare) as \sigma (booking) \bowtie (passenger) (booked) on booking.nid = p.nid booking.fare < booked.averagefare))$

	nid	name	age	ticket_id
1	144_534	Imu	5	G_4129
2	137_527	Noman	5	I_3127
3	140_530	Turno	6	C_4125
4	143_533	Prodipto	6	F_4128
5	136_526	Rafid	7	H_3126
6	139_529	Adnan	8	B_4124
7	138_528	Tahrim	9	A_4123
8	113-503	Syed_Aliya_Ameer	10	F_4132
9	113-503	Syed_Aliya_Ameer	10	C_1113

13. Select the minimum fare from all bookings

```
SELECT min(fare)
from booking;
```

Relational Algebra

$\Pi_{min(fare)}$ (booking)

	min
1	500

14. Select the maximum fare from all bookings

```
SELECT max(fare)
 from  booking;
```

Relational Algebra

$\Pi_{max(fare)}$ (booking)

	max
1	1800

15. Select the minimum age of passenger who are travelling

```
SELECT min(age)
from passenger;
```

Relational Algebra

$\Pi_{min(age)}$ (passenger)

	min
1	5

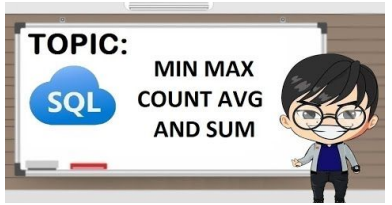
16. Select the minimum age of passenger who are travelling

```
SELECT max(age)
 from passenger;
```

Relational Algebra

$\Pi_{max(age)}$ (passenger)

	max
1	76



17. Print a intersect table of passenger and doctor(view)

```
select *
from passenger intersect select * from doctor;
```

Relational Algebra

$$\Pi_{nid,name,gender,state,city,age,phone\_no,profession}(passenger) \cap (doctor)$$

	nid	name	gender	state	city	age	phone_no	profession
1		Ritu_Kaur	F	Kolkatta	Shibpur	48	7006676743	Doctor
2		Ashmeen	F	Delhi	Gudgaon	41	9902974712	Doctor
3	119_509	Hashmat_Ali	M	Delhi	Nizamuddin	22	9905673413	Doctor
4	122-512	Adnaan_frooq	M	Delhi	Nizamuddin	21	7006578910	Doctor
5	128_518	Tahmid_Ali	M	Delhi	Nizamuddin	48	9905673413	Doctor
6	135_525	Hayat_Hamdani	F	Kolkatta	Shibpur	76	7006789213	Doctor

Select All

18. Print a union table of passenger and doctor(view)

```
select *
from passenger unionselect * from doctor;
```

Relational Algebra

$\Pi_{nid,name,gender,state,city,age,phone\_no,profession,}$ (passenger) **U** (doctor)

	nid	name	gender	state	city	age	phone_no	profession
1	146_536	Rizwan	M	Jammu	Natipora	34	8806343434	Actor
2	145_535	Tareq	M	Mumbai	Indiranagar	31	7006111232	Actor
3	122-512	Adnaan_frooq	M	Delhi	Nizamuddin	21	7006578910	Doctor
4	126_516	Ashmeen	F	Delhi	Gudgaon	41	9902974712	Doctor
5	135_525	Hayat_Hamdani	F	Kolkatta	Shibpur	76	7006789213	Doctor
6	131_521	Ritu_Kaur	F	Kolkatta	Shibpur	48	7006676743	Doctor
7	128_518	Tahmid_Ali	M	Delhi	Nizamuddin	48	9905673413	Doctor
8	119_509	Hashmat_Ali	M	Delhi	Nizamuddin	22	9905673413	Doctor
9	147_537	Robiul	M	Kolkatta	Madhunagar	43	8806454545	Driver
10	133_523	Kaur_Amita	M	Kolkatta	Ichapur	22	9906543219	Engineer
11	130-520	Mehar_mushtaq	F	Kolkatta	Ichapur	21	9906578910	Engineer
12	123_513	Rashid_Ali	M	Delhi	Agra	41	7006555219	Engineer
13	127_517	Mehreen	M	Jammu	Ikhrajpora	22	9906573213	Engineer
14	124_514	Sameer_Hamdani	M	Delhi	Agra	41	9907676233	Engineer
15	125_515	Imran_Zahid	M	Jammu	Ikhrajpora	41	9906573213	Engineer
16	134_524	Nayeem	M	Kolkatta	Ichapur	54	8806342154	Engineer
17	142_532	Tasnim	F	Mumbai	Indiranagar	56	7006875432	Nurse
18	141_531	Tuba	F	Mumbai	Kapadianagar	32	700632145	Nurse
19	148_538	ela	F	Delhi	Agra	36	8806565656	Scientist
20	149_539	tahmid	M	Delhi	Agra	46	8806676767	Scientist
21	116_506	Zakriya_Shabir	M	Jammu	Natipora	22	7006543219	Student
22	138_528	Tahrim	M	Kashmir	Nowhatta	9	9906543219	Student
23	143_533	Prodipto	M	Mumbai	Indiranagar	6	7006343154	Student
24	137_527	Noman	M	Jammu	Natipora	5	7006573213	Student
25	139_529	Adnan	M	Delhi	Agra	8	8806342154	Student
26	113-503	Syed_Aliya_Ameer	F	Kashmir	Rajbagh	10	7006894321	Student
27	140_530	Turno	M	Kolkatta	Shibpur	6	7006789213	Student
28	144_534	Imu	M	Mumbai	Kapadianagar	5	880643215	Student
29	117_507	Mueid_Bhat	M	Jammu	Ikhrakpora	22	8807676743	Student
30	136_526	Jahir	M	Delhi	Agra	3	7006676743	Student
31	114_504	Mehak_Amin	F	Kashmir	Chanapoora	21	9906987654	Student
32	129_519	Sameena_Nasir	F	Kashmir	Chanapoora	21	7006987654	Student
33	115-505	Muskaan_mushtaq	F	Kashmir	Hyderpora	21	7006578910	Student
34	121_511	Rahat_Khurshid	F	Jammu	Nawakadal	22	9906976521	Teacher

19. Print the arrival time and train id of each train that are going to reach at any station

```
SELECT Arrival time,Train_id
FROM  is scheduled
WHERE exists(Select * from is_scheduled );
```

Relational Algebra

$\Pi_{Arrival\_time,Train\_id}$ (is_scheduled)

	arrival_time	train_id
1	13:00:00	82812
2	14:30:00	82823
3	15:00:00	82834
4	16:30:00	82845
5	17:00:00	82856
6	18:30:00	88802
7	19:00:00	82813
8	20:30:00	82824
9	21:00:00	82835
10	22:30:00	82835
11	23:00:00	82857
12	23:30:00	82801
13	13:00:00	82812
14	14:30:00	82823
15	15:00:00	82834
16	16:30:00	82845
17	17:00:00	82856
18	18:30:00	88802
19	19:00:00	82813
20	20:30:00	82824
21	21:00:00	82835
22	22:30:00	82846
23	23:00:00	82857
24	23:30:00	82801

20. Select view Child_train_ticket

```
SELECT * FROM Child_train_ticket;
```

	ticket_id	fare
1	C_1113	500
2	H_3126	500
3	I_3127	500
4	A_4123	500
5	B_4124	500
6	C_4125	500
7	F_4128	500
8	G_4129	500

Relational Algebra

$\Pi_{ticket\_id, fare}$ (Child_train_ticket)

21. Select view Children

```
SELECT * FROM Children
order by age;
```

	nid	name	age
2	136_526	Rafid	7
3	137_527	Noman	5
4	138_528	Tahrim	9
5	139_529	Adnan	8
6	140_530	Turno	6
7	143_533	Prodipto	6
8	144_534	Imu	5

Relational Algebra

$\mathbf{T_{age}}$ ($\Pi_{nid, name, age}$ (Children))

23. Update view Children

```
UPDATE Children
SET name = 'Jahir', age= '3'
WHERE nid = '136_526';
```

	nid	name	age
2	136_526	Rafid	7
3	137_527	Noman	5
4	138_528	Tahrim	9
5	139_529	Adnan	8
6	140_530	Turno	6
7	143_533	Prodipto	6
8	144_534	Imu	5

Before Update

Relational Algebra

$$\Pi_{nid,name,age,name='Jahir'}$$

$$(\sigma\ nid = '136\_526'(children)$$
$$\cup\ \sigma\ nid = '136\_526'(children)$$

	nid	name	age
1	136_526	Jahir	3
2	144_534	Imu	5
3	137_527	Noman	5
4	140_530	Turno	6
5	143_533	Prodipto	6
6	139_529	Adnan	8
7	138_528	Tahrim	9
8	113-503	Syed_Aliya_Ameer	10

After Update

24. Delete a row from view Children

```
DELETE FROM Child_train_ticket
 WHERE ticket_id='G_4129';
```

	ticket_id	fare
1	C_1113	500
2	H_3126	500
3	I_3127	500
4	A_4123	500
5	B_4124	500
6	C_4125	500
7	F_4128	500
8	G_4129	500

Before Delete Operation

Relational Algebra

Child_train_ticket ← Child_train_ticket − σ ticket_id = 'G_4129'(child_train_ticket)

	ticket_id	fare
1	C_1113	500
2	H_3126	500
3	I_3127	500
4	A_4123	500
5	B_4124	500
6	C_4125	500
7	F_4128	500

After Delete Operation

List of Non-trivial Fds

1 . For Schema Agent

→ agent_id -> agent_name;

→ This is in **BCNF** because **agent_id** is a super key

2. For Schema Passenger

→ nid->(name,gender,state,city,age,phone_no,profession)

→ This is in **BCNF** because **nid** is a super key

3. For Schema Train

train_id -> train_name ;

This is in **BCNF** because **train_id** is a super key

4. For Schema Train

ticket_id -> seat_id,train_id ;

This is in **BCNF** because **ticket_id** is a super key

5 . For Schema Station

→ station_id -> Stadium_name;

→ This is in **BCNF** because **Stadium_id** is a super key

6. For Schema Booking

→ Serial_no -> (ticket_id,nid,agent_id,Status,fare,date) ;
→ ticket_id -> (serial_no,nid,agent_id,Status,fare,date) ;
→ nid -> (ticket_id,Serial_no,agent_id,Status,fare,date) ;
→ agent_id -> (ticket_id,serial_no,agent_id,Status,fare,date) ;

→ This is in **BCNF** because **Serial_no,ticket_id,nid,agent_id** are super keys

7. For Schema Train

→train_id,arrival_time,date -> station_id,departure_time ;

This is in **BCNF** because **(train_id,arrival_time,date)** is a super key

Conclusion

In my project of Railway Management System, I have stored all the information of train schedules, passengers and the agents who booked the tickets. This database facilitates passengers to book the train tickets and check the details of trains and their status online, thus avoids inconveniences of going to railway station for each and every query. I have considered the most important requirements only, many more features and details can be added to my project in order to obtain even more user friendly applications which extends the scope of the work.


The End
ROCKY MOUNTAINEER