Trip Planner

15.04.2018

—

Designed by

Group No. 6

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Relational Schema and Tables

Train

- **Train**(<u>train_id</u>, train_name)
  - Primary Key :
    - train_id
  - Foreign Key :
    - None

```
File  Edit  View  Search  Terminal  Help
201651017=> SELECT * FROM train;
train                 traindeparturetime  trainjourneyhours   trainreservation
201651017=> SELECT * FROM train;
 train_id |    train_name
----------+------------------
     1501 | Sadbhavna Express
     1461 | Rathi Express
     1341 | Bhai Superfast
(3 rows)

201651017=>
```

- **TrainDepartureTime**(<u>train_id</u>, <u>source</u>, departure_time)
  - Primary Key :
    - {train_id, source}
  - Foreign Key :
    - train_id from table **Train** as train_id
    - city_name from table **City** as source

```
File  Edit  View  Search  Terminal  Help
201651017=> SELECT * FROM traindeparturetime;
 train_id |   source    | departure_time
----------+-------------+----------------
     1501 | Ahmedabad   | 20:35:00
     1501 | Vadodara    | 22:35:00
     1501 | Mumbai      | 04:05:00
     1461 | Ahmedabad   | 03:05:00
     1461 | Surat       | 07:05:00
     1341 | Gwalior     | 01:00:00
(6 rows)
```

- **TrainReservation**(train_id, class, source, destination, departure_time, fare, train_status, no_of_seats)
  - Primary Key :
    - {train_id, class, source, destination, departure_time}
  - Foreign Key :
    - {train_id, source} from table **TrainDepartureTime** as {trainId, source}
    - city_name from table **City** as destination

```
File Edit View Search Terminal Help
 train_id | class |  source    | destination | departure_date | fare | train_status | no_of_seats
----------+-------+------------+-------------+----------------+------+--------------+-------------
     1501 | GEN   | Ahmedabad  | Mumbai      | 2018-04-15     |  290 | Avbl         |           1
     1501 | GEN   | Ahmedabad  | Mumbai      | 2018-04-16     |  290 | Avbl         |           8
     1501 | GEN   | Ahmedabad  | Mumbai      | 2018-04-17     |  290 | Avbl         |          13
     1501 | SL    | Ahmedabad  | Mumbai      | 2018-04-15     |  699 | WL           |          12
     1501 | SL    | Ahmedabad  | Mumbai      | 2018-04-16     |  699 | RAC          |           1
     1501 | SL    | Ahmedabad  | Mumbai      | 2018-04-17     |  699 | Avbl         |           6
     1501 | AC3   | Ahmedabad  | Mumbai      | 2018-04-15     | 1009 | WL           |          52
     1501 | AC3   | Ahmedabad  | Mumbai      | 2018-04-16     | 1009 | WL           |          12
     1501 | AC3   | Ahmedabad  | Mumbai      | 2018-04-17     | 1009 | Avbl         |           2
     1501 | AC2   | Ahmedabad  | Mumbai      | 2018-04-15     | 1250 | WL           |          67
     1501 | AC2   | Ahmedabad  | Mumbai      | 2018-04-16     | 1250 | WL           |          34
     1501 | AC2   | Ahmedabad  | Mumbai      | 2018-04-17     | 1250 | RAC          |           6
     1501 | AC1   | Ahmedabad  | Mumbai      | 2018-04-15     | 2699 | WL           |          92
     1501 | AC1   | Ahmedabad  | Mumbai      | 2018-04-16     | 2699 | WL           |          13
     1501 | AC1   | Ahmedabad  | Mumbai      | 2018-04-17     | 2699 | WL           |           5
     1501 | GEN   | Ahmedabad  | Vadodara    | 2018-04-15     |   90 | Avbl         |           2
     1501 | GEN   | Ahmedabad  | Vadodara    | 2018-04-16     |   90 | Avbl         |          18
     1501 | GEN   | Ahmedabad  | Vadodara    | 2018-04-17     |   90 | Avbl         |          43
     1501 | SL    | Ahmedabad  | Vadodara    | 2018-04-15     |  199 | WL           |          22
     1501 | SL    | Ahmedabad  | Vadodara    | 2018-04-16     |  199 | RAC          |          11
     1501 | SL    | Ahmedabad  | Vadodara    | 2018-04-17     |  199 | Avbl         |           8
     1501 | AC3   | Ahmedabad  | Vadodara    | 2018-04-15     |  409 | WL           |          22
     1501 | AC3   | Ahmedabad  | Vadodara    | 2018-04-16     |  409 | WL           |          22
     1501 | AC3   | Ahmedabad  | Vadodara    | 2018-04-17     |  409 | Avbl         |          12
     1501 | AC2   | Ahmedabad  | Vadodara    | 2018-04-15     |  750 | WL           |          37
     1501 | AC2   | Ahmedabad  | Vadodara    | 2018-04-16     |  750 | WL           |           4
     1501 | AC2   | Ahmedabad  | Vadodara    | 2018-04-17     |  750 | RAC          |          12
     1501 | AC1   | Ahmedabad  | Vadodara    | 2018-04-15     | 1699 | WL           |          52
     1501 | AC1   | Ahmedabad  | Vadodara    | 2018-04-16     | 1699 | WL           |           3
     1501 | AC1   | Ahmedabad  | Vadodara    | 2018-04-17     | 1699 | RAC          |           1
     1501 | GEN   | Ahmedabad  | Ujjain      | 2018-04-15     |  390 | RAC          |           7
     1501 | GEN   | Ahmedabad  | Ujjain      | 2018-04-16     |  390 | Avbl         |           3
     1501 | GEN   | Ahmedabad  | Ujjain      | 2018-04-17     |  390 | Avbl         |           1
     1501 | SL    | Ahmedabad  | Ujjain      | 2018-04-15     |  799 | WL           |          42
     1501 | SL    | Ahmedabad  | Ujjain      | 2018-04-16     |  799 | WL           |          13
     1501 | SL    | Ahmedabad  | Ujjain      | 2018-04-17     |  799 | Avbl         |           4
     1501 | AC3   | Ahmedabad  | Ujjain      | 2018-04-15     | 1209 | WL           |          62
     1501 | AC3   | Ahmedabad  | Ujjain      | 2018-04-16     | 1209 | RAC          |           4
     1501 | AC3   | Ahmedabad  | Ujjain      | 2018-04-17     | 1209 | RAC          |           2
     1501 | AC2   | Ahmedabad  | Ujjain      | 2018-04-15     | 1450 | WL           |          77
     1501 | AC2   | Ahmedabad  | Ujjain      | 2018-04-16     | 1450 | WL           |          54
     1501 | AC2   | Ahmedabad  | Ujjain      | 2018-04-17     | 1450 | WL           |          16
     1501 | AC1   | Ahmedabad  | Ujjain      | 2018-04-15     | 2899 | WL           |         102
     1501 | AC1   | Ahmedabad  | Ujjain      | 2018-04-16     | 2899 | WL           |          53
:
```

- **TrainJourneyHours**(train_id, source, destination, journey_hours)
  - Primary Key :
    - {train_id, source, destination}
  - Foreign Key :
    - {train_id, source} from table **TrainDepartureTime** as {train_id, source}
    - city_name from table **City** as destination

```
File  Edit  View  Search  Terminal  Help
201651017=> SELECT * FROM trainjourneyhours;
 train_id |   source    | destination | journey_hours
----------+-------------+-------------+---------------
     1501 | Ahmedabad   | Mumbai      |           7.5
     1501 | Ahmedabad   | Vadodara    |             2
     1501 | Ahmedabad   | Ujjain      |         12.75
     1501 | Vadodara    | Mumbai      |           5.5
     1501 | Vadodara    | Ujjain      |         10.75
     1501 | Mumbai      | Ujjain      |          5.25
     1461 | Ahmedabad   | Surat       |             4
     1461 | Ahmedabad   | Mumbai      |           7.5
     1461 | Surat       | Mumbai      |           3.5
     1341 | Gwalior     | Ahmedabad   |          20.5
(10 rows)
```

Cab

- **CabType**(cab_type)
  - Primary Key :
    - cab_type
  - Foreign Key :
    - None

```
File  Edit  View  Search  Terminal  Help
201651017=> SELECT * FROM cabtype;
 cab_type
-----------
 Sedan
 SUV
 HatchBack
(3 rows)

201651017=>
```

- **CabService**(cab_service_id, provider_name, contact_no, rating)
  - Primary Key :
    - cab_service_id
  - Foreign Key :
    - None

```
File  Edit  View  Search  Terminal  Help
201651017=> SELECT * FROM cabservice;
 cab_service_id | provider_name | contact_no | rating
----------------+---------------+------------+--------
 C101           | Uber          | 9925436212 |    4.5
 C102           | Ola           | 9428564578 |    4.3
 C103           | Jugnoo        | 6758934125 |      4
 C104           | GozoCabs      | 7894256523 |    3.5
 C105           | Savaari       | 8844563214 |    3.2
(5 rows)

201651017=> 
```

- **CabServiceInACity**(cab_service_id, city_name)
  - Primary Key :
    - {cab_service_id, city_name}
  - Foreign Key :
    - cab_service_id from table **CabService** as cab_service_id
    - city_name from table **City** as city_name

```
File  Edit  View  Search  Terminal  Help
201651017=> SELECT * FROM cabserviceinacity;
 cab_service_id | city_name
----------------+-----------
 C101           | Ahmedabad
 C102           | Ahmedabad
 C103           | Ahmedabad
 C104           | Ahmedabad
 C105           | Ahmedabad
 C101           | Vadodara
 C102           | Vadodara
 C103           | Vadodara
 C101           | Surat
 C102           | Surat
 C101           | Mumbai
 C102           | Mumbai
 C103           | Mumbai
 C104           | Mumbai
 C105           | Mumbai
 C101           | Ujjain
 C102           | Ujjain
 C104           | Ujjain
 C101           | Gwalior
 C102           | Gwalior
(20 rows)
```

- **Cabs**(cab_service_id, city_name, cab_type, cost_per_day, total_available_cabs)
    - Primary Key :
        - {cab_service_id, city_name, cab_type}
    - Foreign Key :
        - {cab_service_id, city_name} from table **CabServiceInACity** as{cab_service_id, city_name}
        - cab_type from table **CabType** as cab_type

cab_service_id	city_name	cab_type	cost_per_day	total_available_cabs
C101	Ahmedabad	Sedan	1000	20
C101	Ahmedabad	SUV	1200	15
C101	Ahmedabad	HatchBack	750	12
C102	Ahmedabad	Sedan	900	18
C102	Ahmedabad	SUV	1150	15
C102	Ahmedabad	HatchBack	780	10
C103	Ahmedabad	Sedan	950	16
C103	Ahmedabad	SUV	1250	12
C103	Ahmedabad	HatchBack	800	8
C104	Ahmedabad	SUV	1120	20
C104	Ahmedabad	HatchBack	730	15
C105	Ahmedabad	HatchBack	800	14
C101	Vadodara	Sedan	1000	20
C101	Vadodara	SUV	1200	15
C101	Vadodara	HatchBack	750	12
C102	Vadodara	Sedan	900	18
C102	Vadodara	SUV	1150	15
C102	Vadodara	HatchBack	780	10
C103	Vadodara	Sedan	950	16
C103	Vadodara	SUV	1250	12
C103	Vadodara	HatchBack	800	8
C101	Surat	Sedan	1000	20
C101	Surat	SUV	1200	15
C101	Surat	HatchBack	750	12
C102	Surat	Sedan	900	18
C102	Surat	SUV	1150	15
C102	Surat	HatchBack	780	10
C101	Mumbai	Sedan	1000	20
C101	Mumbai	SUV	1200	15
C101	Mumbai	HatchBack	750	12
C102	Mumbai	Sedan	900	18
C102	Mumbai	SUV	1150	15
C102	Mumbai	HatchBack	780	10
C103	Mumbai	Sedan	950	16
C103	Mumbai	SUV	1250	12
C103	Mumbai	HatchBack	800	8
C104	Mumbai	SUV	1120	20
C104	Mumbai	HatchBack	730	15
C105	Mumbai	HatchBack	800	14
C101	Ujjain	Sedan	1000	20
C101	Ujjain	SUV	1200	15
C101	Ujjain	HatchBack	750	12
C102	Ujjain	Sedan	900	18
C102	Ujjain	SUV	1150	15

:

Bus

- **Bus**(<u>bus_id</u>, bus_service_provider, is_ac, rating)
  - Primary Key :
    - bus_id
  - Foreign Key :
    - None

```
File  Edit  View  Search  Terminal  Help
201651017=> SELECT * FROM bus;
 bus_id | bus_service_provider | is_ac | rating
--------+----------------------+-------+--------
 GJ1001 | Underwoods           | t     |      4
 GJ1002 | Underwoods           | f     |      2
 GJ1003 | Underwoods           | t     |    4.5
 GJ1004 | Underwoods           | t     |      3
 GJ1005 | Underwoods           | f     |      4
 GJ1006 | Underwoods           | f     |      4
 GJ1007 | Underwoods           | t     |      3
 GJ1008 | Underwoods           | f     |      5
 GJ1009 | Underwoods           | t     |    4.5
 GJ1010 | Underwoods           | t     |    4.5
 MH1001 | Conways              | t     |      2
 MH1002 | Conways              | f     |      2
 MH1003 | Conways              | f     |      3
 MH1004 | Conways              | f     |    2.5
 MH1005 | Conways              | t     |    3.5
 MP1001 | Lannisters           | t     |    2.5
 MP1002 | Lannisters           | f     |      3
 MP1003 | Lannisters           | t     |      4
 MP1004 | Lannisters           | t     |      5
(19 rows)
```

- **BusDepartureTime**(<u>bus_id</u>, <u>source</u>, <u>departure_date</u>, time_of_departure)
  - Primary Key :
    - {bus_id, source, departure_date}
  - Foreign Key :
    - bus_id from table **Bus** as bus_id
    - city_name from table **City** as source

File Edit View Search Terminal Help

bus_id	source	departure_date	time_of_departure
GJ1001	Ahmedabad	2018-04-15	16:30:00
GJ1001	Ahmedabad	2018-04-16	17:30:00
GJ1001	Ahmedabad	2018-04-17	18:00:00
GJ1002	Ahmedabad	2018-04-15	16:30:00
GJ1002	Ahmedabad	2018-04-16	17:30:00
GJ1002	Ahmedabad	2018-04-17	18:00:00
GJ1003	Ahmedabad	2018-04-15	16:30:00
GJ1003	Ahmedabad	2018-04-16	17:30:00
GJ1003	Ahmedabad	2018-04-17	18:00:00
GJ1004	Ahmedabad	2018-04-15	16:30:00
GJ1004	Ahmedabad	2018-04-16	17:30:00
GJ1004	Ahmedabad	2018-04-17	18:00:00
GJ1005	Ahmedabad	2018-04-15	16:30:00
GJ1005	Ahmedabad	2018-04-16	17:30:00
GJ1005	Ahmedabad	2018-04-17	18:00:00
GJ1010	Ahmedabad	2018-04-15	16:30:00
GJ1010	Ahmedabad	2018-04-16	17:30:00
GJ1010	Ahmedabad	2018-04-17	18:00:00
MH1001	Mumbai	2018-04-15	16:30:00
MH1001	Mumbai	2018-04-16	22:30:00
MH1002	Mumbai	2018-04-17	18:30:00
MH1003	Mumbai	2018-04-15	16:30:00
MH1003	Mumbai	2018-04-16	20:30:00
MH1004	Mumbai	2018-04-16	17:30:00
MH1004	Mumbai	2018-04-17	21:30:00
MH1005	Mumbai	2018-04-15	23:30:00
GJ1001	Vadodara	2018-04-15	18:30:00
GJ1001	Vadodara	2018-04-16	19:30:00
GJ1001	Vadodara	2018-04-17	20:00:00
GJ1002	Vadodara	2018-04-15	18:30:00
GJ1002	Vadodara	2018-04-16	19:30:00
GJ1002	Vadodara	2018-04-17	20:00:00
GJ1003	Vadodara	2018-04-15	18:30:00
GJ1003	Vadodara	2018-04-16	19:30:00
GJ1003	Vadodara	2018-04-17	20:00:00
GJ1006	Vadodara	2018-04-15	16:30:00
GJ1006	Vadodara	2018-04-16	17:30:00
GJ1006	Vadodara	2018-04-17	18:00:00
GJ1007	Vadodara	2018-04-15	16:30:00
GJ1007	Vadodara	2018-04-16	17:30:00
GJ1007	Vadodara	2018-04-17	18:00:00
GJ1001	Surat	2018-04-15	22:30:00
GJ1001	Surat	2018-04-16	23:30:00
GJ1001	Surat	2018-04-17	00:00:00

- **BusJourneyHours**(<u>bus_id</u>, <u>source</u>, <u>destination</u>, <u>departure_date</u>, journey_hours)
  - Primary Key :
    - {bus_id, source, destination, departure_date}
  - Foreign Key :
    - {bus_id, source, departure_date} from table **BusDepartureTime** as {bus_id, source, departure_date}
    - city_name from table **City** as destination

```
File  Edit  View  Search  Terminal  Help
bus_id  |     source    |  destination  |  departure_date  |  journey_hours
--------+---------------+---------------+------------------+---------------
GJ1001  | Ahmedabad     | Vadodara      | 2018-04-15       |             2
GJ1001  | Ahmedabad     | Vadodara      | 2018-04-16       |             2
GJ1001  | Ahmedabad     | Vadodara      | 2018-04-17       |             2
GJ1002  | Ahmedabad     | Vadodara      | 2018-04-15       |             2
GJ1002  | Ahmedabad     | Vadodara      | 2018-04-16       |             2
GJ1002  | Ahmedabad     | Vadodara      | 2018-04-17       |             2
GJ1003  | Ahmedabad     | Vadodara      | 2018-04-15       |             2
GJ1003  | Ahmedabad     | Vadodara      | 2018-04-16       |             2
GJ1003  | Ahmedabad     | Vadodara      | 2018-04-17       |             2
GJ1004  | Ahmedabad     | Vadodara      | 2018-04-15       |             2
GJ1004  | Ahmedabad     | Vadodara      | 2018-04-16       |             2
GJ1004  | Ahmedabad     | Vadodara      | 2018-04-17       |             2
GJ1001  | Ahmedabad     | Surat         | 2018-04-15       |             5
GJ1001  | Ahmedabad     | Surat         | 2018-04-16       |             5
GJ1001  | Ahmedabad     | Surat         | 2018-04-17       |             5
GJ1002  | Ahmedabad     | Surat         | 2018-04-15       |             5
GJ1002  | Ahmedabad     | Surat         | 2018-04-16       |             5
GJ1002  | Ahmedabad     | Surat         | 2018-04-17       |             5
GJ1003  | Ahmedabad     | Surat         | 2018-04-15       |             5
GJ1003  | Ahmedabad     | Surat         | 2018-04-16       |             5
GJ1003  | Ahmedabad     | Surat         | 2018-04-17       |             5
GJ1001  | Ahmedabad     | Mumbai        | 2018-04-15       |             9
GJ1001  | Ahmedabad     | Mumbai        | 2018-04-16       |             9
GJ1001  | Ahmedabad     | Mumbai        | 2018-04-17       |             9
GJ1002  | Ahmedabad     | Mumbai        | 2018-04-15       |             9
GJ1002  | Ahmedabad     | Mumbai        | 2018-04-16       |             9
GJ1002  | Ahmedabad     | Mumbai        | 2018-04-17       |             9
GJ1005  | Ahmedabad     | Ujjain        | 2018-04-15       |             8
GJ1005  | Ahmedabad     | Ujjain        | 2018-04-16       |             8
GJ1005  | Ahmedabad     | Ujjain        | 2018-04-17       |             8
GJ1010  | Ahmedabad     | Gwalior       | 2018-04-15       |            15
GJ1010  | Ahmedabad     | Gwalior       | 2018-04-16       |            15
GJ1010  | Ahmedabad     | Gwalior       | 2018-04-17       |            15
GJ1001  | Vadodara      | Surat         | 2018-04-15       |             3
GJ1001  | Vadodara      | Surat         | 2018-04-16       |             3
GJ1001  | Vadodara      | Surat         | 2018-04-17       |             3
GJ1002  | Vadodara      | Surat         | 2018-04-15       |             3
GJ1002  | Vadodara      | Surat         | 2018-04-16       |             3
GJ1002  | Vadodara      | Surat         | 2018-04-17       |             3
GJ1003  | Vadodara      | Surat         | 2018-04-15       |             3
GJ1003  | Vadodara      | Surat         | 2018-04-16       |             3
GJ1003  | Vadodara      | Surat         | 2018-04-17       |             3
GJ1001  | Vadodara      | Mumbai        | 2018-04-15       |             7
GJ1001  | Vadodara      | Mumbai        | 2018-04-16       |             7
:
```

- **BusReservation**(<u>bus_id</u>, <u>source</u>, <u>destination</u>, <u>departure_date</u>, <u>seat_type</u>, cost, total_available_seats)
  - Primary Key :
    - {bus_id, source, destination, departure_date, seat_type}
  - Foreign Key :
    - {bus_id, source, departure_date} from table **BusDepartureTime** as {bus_id, source, departure_date}
    - city_name from table **City** as destination

```
File  Edit  View  Search  Terminal  Help
bus_id |   source   | destination | departure_date | seat_type | cost | total_available_seats
--------+------------+-------------+----------------+-----------+------+-----------------------
GJ1001 | Ahmedabad  | Vadodara    | 2018-04-15     | seater    | 300  |                    10
GJ1001 | Ahmedabad  | Surat       | 2018-04-16     | seater    | 700  |                    15
GJ1001 | Ahmedabad  | Mumbai      | 2018-04-17     | seater    | 1000 |                    20
GJ1002 | Ahmedabad  | Vadodara    | 2018-04-15     | seater    | 200  |                     5
GJ1002 | Ahmedabad  | Surat       | 2018-04-16     | seater    | 450  |                    11
GJ1002 | Ahmedabad  | Mumbai      | 2018-04-17     | seater    | 700  |                    13
GJ1001 | Ahmedabad  | Surat       | 2018-04-16     | sleeper   | 1000 |                     5
GJ1001 | Ahmedabad  | Mumbai      | 2018-04-17     | sleeper   | 1500 |                    10
GJ1002 | Ahmedabad  | Surat       | 2018-04-16     | sleeper   | 800  |                    11
GJ1002 | Ahmedabad  | Mumbai      | 2018-04-17     | sleeper   | 1100 |                    13
GJ1003 | Ahmedabad  | Vadodara    | 2018-04-15     | seater    | 300  |                     5
GJ1003 | Ahmedabad  | Vadodara    | 2018-04-16     | seater    | 300  |                     7
GJ1003 | Ahmedabad  | Vadodara    | 2018-04-17     | seater    | 300  |                     9
GJ1003 | Ahmedabad  | Surat       | 2018-04-15     | seater    | 700  |                     3
GJ1003 | Ahmedabad  | Surat       | 2018-04-16     | seater    | 700  |                     6
GJ1003 | Ahmedabad  | Surat       | 2018-04-17     | seater    | 700  |                    10
GJ1003 | Ahmedabad  | Surat       | 2018-04-15     | sleeper   | 1000 |                     3
GJ1003 | Ahmedabad  | Surat       | 2018-04-16     | sleeper   | 1000 |                     6
GJ1003 | Ahmedabad  | Surat       | 2018-04-17     | sleeper   | 1000 |                    10
GJ1004 | Ahmedabad  | Vadodara    | 2018-04-15     | seater    | 300  |                     2
GJ1004 | Ahmedabad  | Vadodara    | 2018-04-16     | seater    | 300  |                     7
GJ1004 | Ahmedabad  | Vadodara    | 2018-04-17     | seater    | 300  |                    11
GJ1005 | Ahmedabad  | Ujjain      | 2018-04-15     | sleeper   | 1000 |                    12
GJ1005 | Ahmedabad  | Ujjain      | 2018-04-16     | sleeper   | 1000 |                    15
GJ1005 | Ahmedabad  | Ujjain      | 2018-04-17     | sleeper   | 1000 |                    11
GJ1010 | Ahmedabad  | Gwalior     | 2018-04-15     | sleeper   | 1500 |                     8
GJ1010 | Ahmedabad  | Gwalior     | 2018-04-16     | sleeper   | 1500 |                    11
GJ1010 | Ahmedabad  | Gwalior     | 2018-04-17     | sleeper   | 1500 |                    14
MH1001 | Mumbai     | Ahmedabad   | 2018-04-15     | seater    | 1000 |                     5
MH1001 | Mumbai     | Ahmedabad   | 2018-04-16     | seater    | 1000 |                     8
MH1002 | Mumbai     | Ahmedabad   | 2018-04-17     | seater    | 700  |                    11
MH1001 | Mumbai     | Vadodara    | 2018-04-15     | seater    | 800  |                    10
MH1001 | Mumbai     | Vadodara    | 2018-04-16     | seater    | 800  |                    12
MH1002 | Mumbai     | Vadodara    | 2018-04-17     | seater    | 550  |                    10
MH1001 | Mumbai     | Surat       | 2018-04-15     | seater    | 500  |                     5
MH1001 | Mumbai     | Surat       | 2018-04-16     | seater    | 500  |                     7
MH1002 | Mumbai     | Surat       | 2018-04-17     | seater    | 300  |                     8
MH1001 | Mumbai     | Ahmedabad   | 2018-04-15     | sleeper   | 1500 |                     7
MH1001 | Mumbai     | Ahmedabad   | 2018-04-16     | sleeper   | 1500 |                     6
MH1002 | Mumbai     | Ahmedabad   | 2018-04-17     | sleeper   | 1100 |                     7
MH1001 | Mumbai     | Vadodara    | 2018-04-15     | sleeper   | 1200 |                     5
MH1001 | Mumbai     | Vadodara    | 2018-04-16     | sleeper   | 1200 |                    10
MH1002 | Mumbai     | Vadodara    | 2018-04-17     | sleeper   | 750  |                     7
MH1001 | Mumbai     | Surat       | 2018-04-15     | sleeper   | 800  |                     5
:
```

City

- **City**(city_name)
  - ○ Primary Key :
    - ■ city_name
  - ○ Foreign Key :
    - ■ None

```
File Edit View Search Terminal Help
201651017=> SELECT * FROM city;
 city_name
-----------
 Ahmedabad
 Mumbai
 Ujjain
 Gwalior
 Vadodara
 Surat
(6 rows)

201651017=>
```

- **NearByCities**(current_city, nearby_cIty)
  - ○ Primary Key :
    - ■ {current_city, nearby_city}
  - ○ Foreign Key :
    - ■ city_name from table **City** as currentc_city
    - ■ city_name from table **City** as nearby_city

```
File  Edit  View  Search  Terminal  Help
201651017=> SELECT * FROM nearbycities;
 current_city | nearby_city
--------------+-------------
 Ahmedabad    | Vadodara
 Ahmedabad    | Surat
 Vadodara     | Ahmedabad
 Vadodara     | Mumbai
 Mumbai       | Vadodara
 Mumbai       | Ujjain
 Ujjain       | Gwalior
 Ujjain       | Mumbai
 Gwalior      | Ujjain
 Surat        | Ahmedabad
(10 rows)
```

Locality

- **Locality**(<u>locality_id</u>, locality_name, city_name)
  - Primary Key :
    - locality_id
  - Foreign Key :
    - city_name from table **City** as city_name

```
File  Edit  View  Search  Terminal  Help
201651017=> SELECT * FROM locality;
 locality_id | locality_name | city_name
-------------+---------------+-----------
           1 | Ranip         | Ahmedabad
           2 | Vastrapur     | Ahmedabad
           3 | Chandkheda    | Ahmedabad
           4 | Satallite     | Ahmedabad
           5 | Sector B12    | Ahmedabad
           6 | Visat         | Ahmedabad
           7 | Sector 2      | Vadodara
           8 | Sector A4     | Vadodara
           9 | Sector 7      | Vadodara
          10 | Jamgaun       | Vadodara
          11 | BijaPur       | Vadodara
          12 | Sector L      | Surat
          13 | Sector M      | Surat
          14 | Sector A1     | Mumbai
          15 | Bilapuara     | Mumbai
          16 | Sector A2     | Ujjain
          17 | Harinagar     | Gwalior
(17 rows)
```
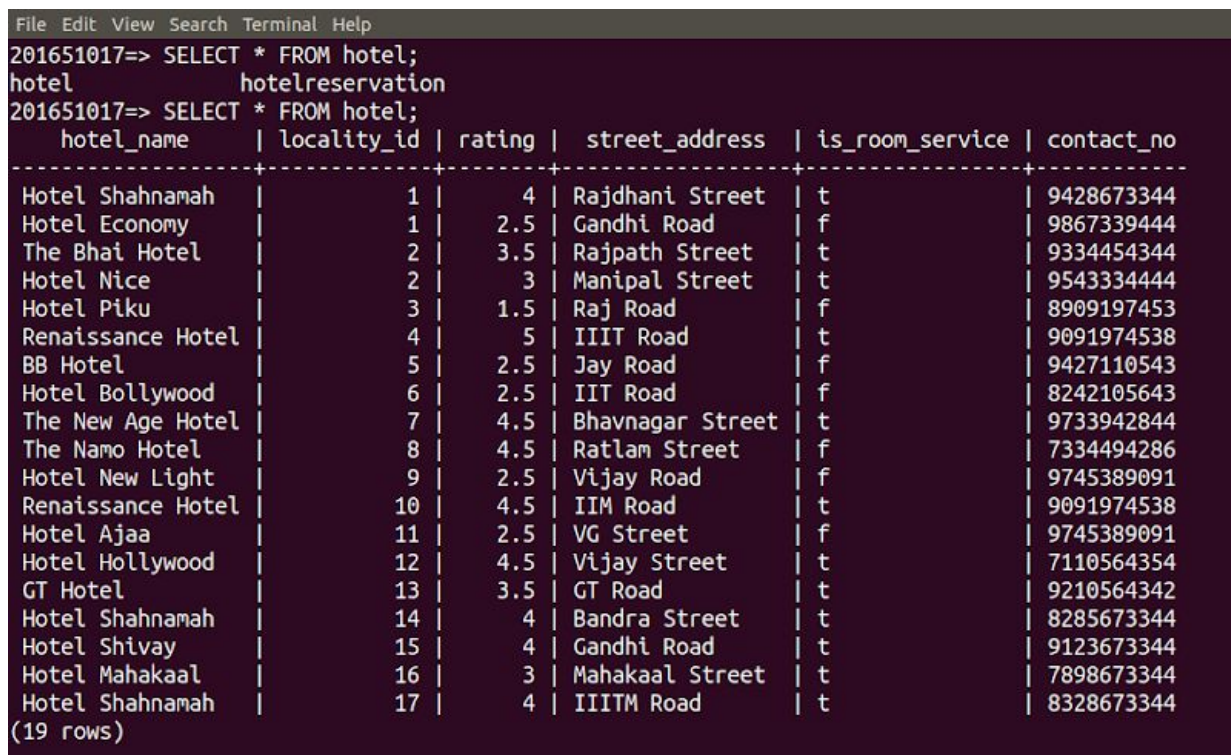
Place to visit

- **PlacesToVisit**(place_name, locality_id, place_type, description_of_the_place, street_address, rating, avg_cost_per_person)
  - Primary Key :
    - {place_name, locality_id}
  - Foreign Key :
    - locality_id from table **Locality** as locality_id

```
File  Edit  View  Search  Terminal  Help
        place_name         | locality_id | place_type  |                                                              description_of_the_
                           |             | street_address     |  rating | avg_cost_per_person
------------------------+-------------+-------------+------------------------------------+---------+----------------------
 Riverfront             |           1 | Leisure     | Sabarmati Riverfront is a waterfront being developed along the banks of Sabarmati river.
                        | Sabarmati Road     |   4.5 |        80
 Kankariya Lake         |           1 | Leisure     | Kankaria Lake, formerly known as Hauj-e-Qutb, is the second largest lake in Ahmedabad, Gu
ern part of the city.   | 132 ft. Ring Road  |   4.5 |       100
 Gandhi Ashram          |           2 | Historical  | Gandhi Ashram refers to Sabarmati Ashram, in Ahmedabad, India, one of the residences of M
                        | Ashram Road        |   3.5 |        10
 Alpha One Mall         |           2 | Leisure     | The mall was opened in October 2011 and is the largest mixed used city centre in Ahmedaba
                        | Vastrapur Lake Road |   4.2 |         0
 Museum                 |           3 | Historical  | This Museum is a collection of Pictures depecting Gujarat`s History.
                        | Road A             |   3.5 |        70
 Sidi Saiyyed Mosque    |           4 | Historical  | It was built by Sidi Saiyyid in the retinue of Bilal Jhajar Khan, general in the army of
I of the Gujarat Sultanate. | Road B         |   3.9 |         0
 Adalaj Stepwell        |           5 | Historical  | Ancient Stepwell with detailed carvings.
                        | Adalaj Road        |   3.7 |         0
 Science City           |           6 | Educational | It hosts an IMAX 3D theatre, an energy park, a hall of science, Planet Earth, an amphithe
untains among others.   | Hebatpur           |     4 |       150
 Laxmi Vilas Palace     |           7 | Historical  | Massive, 19th-century palace in landscaped surrounds featuring an art museum, concert hal
                        | J.N.Marg           |   4.5 |        80
 Baroda Museum          |           8 | Historical  | Century-old museum & gallery displaying Asian & Middle Eastern paintings, sculptures & we
                        | Sayajigunj         |   3.9 |        70
 Sayaji Baug            |           9 | Leisure     | Sprawling park featuring a museum, a planetarium, a zoo & a small train in a garden setti
                        | B.G. Road          |   3.7 |        50
 Sursagar Lake          |          10 | Leisure     | Sur Sagar lake also known as the Chand Talao is a lake situated in middle of the city. Th
18th Century.           | Sursagar Road      |     4 |         0
 Sardar Patel Planetarium |        11 | Leisure     | 200-seat planetarium offering shows in English, Gujarati & Hindi focusing on astronomical
                        | Kalughoda Circle   |   4.1 |       120
 IIIT Vadodara          |          11 | Educational | It may become Campus of IIIT Vadodara
                        | Unknown            |   2.5 |         0
 Dumas Beach            |          12 | Leisure     | Dumas Beach is an urban beach along the Arabian Sea, located 21 kilometres southwest of t
                        | Konkan coast       |   4.5 |         0
 Old Fort               |          12 | Historical  | This defensive fortress was constructed in the 16th century by Sultan Mahmood III.
                        | Chowk Bazar, Varasa |   4.1 |       100
 Amaazia                |          13 | Leisure     | Amaazia Amusement Park or Amaazia Waterpark is an amusement water park in Surat.
                        | Canal Road         |   4.2 |       300
```

Hotels

- **Hotel**(<u>hotel_name</u>, <u>locality_id</u>, ratings, street_address, is_room_service, contact_no)
  - Primary Key :
    - {hotel_name, locality_id}
  - Foreign Key :
    - locality_id from table **Locality** as locality_id

```
File  Edit  View  Search  Terminal  Help
201651017=> SELECT * FROM hotel;
hotel            hotelreservation
201651017=> SELECT * FROM hotel;
    hotel_name    | locality_id | rating |   street_address   | is_room_service | contact_no
------------------+-------------+--------+--------------------+-----------------+------------
 Hotel Shahnamah  |           1 |      4 | Rajdhani Street    | t               | 9428673344
 Hotel Economy    |           1 |    2.5 | Gandhi Road        | f               | 9867339444
 The Bhai Hotel   |           2 |    3.5 | Rajpath Street     | t               | 9334454344
 Hotel Nice       |           2 |      3 | Manipal Street     | t               | 9543334444
 Hotel Piku       |           3 |    1.5 | Raj Road           | f               | 8909197453
 Renaissance Hotel|           4 |      5 | IIIT Road          | t               | 9091974538
 BB Hotel         |           5 |    2.5 | Jay Road           | f               | 9427110543
 Hotel Bollywood  |           6 |    2.5 | IIT Road           | f               | 8242105643
 The New Age Hotel|           7 |    4.5 | Bhavnagar Street   | t               | 9733942844
 The Namo Hotel   |           8 |    4.5 | Ratlam Street      | f               | 7334494286
 Hotel New Light  |           9 |    2.5 | Vijay Road         | f               | 9745389091
 Renaissance Hotel|          10 |    4.5 | IIM Road           | t               | 9091974538
 Hotel Ajaa       |          11 |    2.5 | VG Street          | f               | 9745389091
 Hotel Hollywood  |          12 |    4.5 | Vijay Street       | t               | 7110564354
 GT Hotel         |          13 |    3.5 | GT Road            | t               | 9210564342
 Hotel Shahnamah  |          14 |      4 | Bandra Street      | t               | 8285673344
 Hotel Shivay     |          15 |      4 | Gandhi Road        | t               | 9123673344
 Hotel Mahakaal   |          16 |      3 | Mahakaal Street    | t               | 7898673344
 Hotel Shahnamah  |          17 |      4 | IIITM Road         | t               | 8328673344
(19 rows)
```

- **HotelReservation**(<u>hotel_name</u>, <u>locality_id</u>, <u>date_of_availability</u>, <u>room_type</u>, total_available_rooms, cost)
  - Primary Key :
    - {hotel_name, locality_id, date_of_availability, room_type}
  - Foreign Key :
    - {hotel_name, locality_id} from table **Hotels** as {hotel_name, locality_id}
    - room_type from table **TypeOfRoom** as room_type

```
File Edit View Search Terminal Help
    hotel_name      | locality_id | date_of_availability | room_type   | total_available_rooms | cost
--------------------+-------------+----------------------+-------------+-----------------------+------
 Hotel Shahnamah    |           1 | 2018-04-15           | Single Bed  |                     3 |  500
 Hotel Shahnamah    |           1 | 2018-04-15           | Double Bed  |                     3 |  600
 Hotel Shahnamah    |           1 | 2018-04-16           | Single Bed  |                     4 |  450
 Hotel Shahnamah    |           1 | 2018-04-16           | Double Bed  |                     2 |  550
 Hotel Shahnamah    |           1 | 2018-04-17           | Single Bed  |                     5 |  400
 Hotel Shahnamah    |           1 | 2018-04-17           | Double Bed  |                     4 |  500
 Hotel Economy      |           1 | 2018-04-15           | Single Bed  |                     2 |  120
 Hotel Economy      |           1 | 2018-04-15           | Double Bed  |                     1 |  150
 Hotel Economy      |           1 | 2018-04-16           | Single Bed  |                     1 |  110
 Hotel Economy      |           1 | 2018-04-16           | Double Bed  |                     2 |  140
 Hotel Economy      |           1 | 2018-04-17           | Single Bed  |                     1 |  100
 Hotel Economy      |           1 | 2018-04-17           | Double Bed  |                     3 |  120
 The Bhai Hotel     |           2 | 2018-04-15           | Single Bed  |                     0 |  350
 The Bhai Hotel     |           2 | 2018-04-15           | Double Bed  |                     1 |  450
 The Bhai Hotel     |           2 | 2018-04-16           | Single Bed  |                     0 |  300
 The Bhai Hotel     |           2 | 2018-04-16           | Double Bed  |                     2 |  400
 The Bhai Hotel     |           2 | 2018-04-17           | Single Bed  |                     1 |  250
 The Bhai Hotel     |           2 | 2018-04-17           | Double Bed  |                     1 |  350
 Hotel Nice         |           2 | 2018-04-15           | Single Bed  |                     0 |  300
 Hotel Nice         |           2 | 2018-04-15           | Double Bed  |                     0 |  400
 Hotel Nice         |           2 | 2018-04-16           | Single Bed  |                     0 |  250
 Hotel Nice         |           2 | 2018-04-16           | Double Bed  |                     0 |  350
 Hotel Nice         |           2 | 2018-04-17           | Single Bed  |                     0 |  200
 Hotel Nice         |           2 | 2018-04-17           | Double Bed  |                     0 |  300
 Hotel Piku         |           3 | 2018-04-15           | Single Bed  |                     1 |  300
 Hotel Piku         |           3 | 2018-04-15           | Double Bed  |                     2 |  400
 Hotel Piku         |           3 | 2018-04-16           | Single Bed  |                     2 |  250
 Hotel Piku         |           3 | 2018-04-16           | Double Bed  |                     3 |  350
 Hotel Piku         |           3 | 2018-04-17           | Single Bed  |                     4 |  200
 Hotel Piku         |           3 | 2018-04-17           | Double Bed  |                     5 |  300
 Renaissance Hotel  |           4 | 2018-04-15           | Single Bed  |                     0 | 1300
 Renaissance Hotel  |           4 | 2018-04-15           | Double Bed  |                     0 | 1400
 Renaissance Hotel  |           4 | 2018-04-16           | Single Bed  |                     1 | 1250
 Renaissance Hotel  |           4 | 2018-04-16           | Double Bed  |                     2 | 1350
 Renaissance Hotel  |           4 | 2018-04-17           | Single Bed  |                     4 | 1200
 Renaissance Hotel  |           4 | 2018-04-17           | Double Bed  |                     3 | 1300
 BB Hotel           |           5 | 2018-04-15           | Single Bed  |                     1 |  550
 BB Hotel           |           5 | 2018-04-15           | Double Bed  |                     2 |  450
 BB Hotel           |           5 | 2018-04-16           | Single Bed  |                     2 |  500
 BB Hotel           |           5 | 2018-04-16           | Double Bed  |                     3 |  400
 BB Hotel           |           5 | 2018-04-17           | Single Bed  |                     3 |  450
 BB Hotel           |           5 | 2018-04-17           | Double Bed  |                     4 |  350
 Hotel Bollywood    |           6 | 2018-04-15           | Single Bed  |                     0 |  500
 Hotel Bollywood    |           6 | 2018-04-15           | Double Bed  |                     0 |  400
```

- **TypeOfRoom**(<u>room_type</u>, max_accomodation)
  - Primary Key :
    - room_type
  - Foreign Key :
    - None

```
File Edit View Search Terminal Help
201651017=> SELECT * FROM typeofroom;
 room_type  | max_accomodation
------------+------------------
 Single Bed |                1
 Double Bed |                2
(2 rows)
```

Restaurants

- **Restaurants**(<u>restaurant_name</u>, <u>locality_id</u>, restaurant_type, rating, street_address, avg_cost_per_person)
  - Primary Key :
    - {restaurant_name, locality_id}
  - Foreign Key :
    - locality_id from table **Locality** as locality_id

```
File  Edit  View  Search  Terminal  Help
201651017=> SELECT * FROM restaurants;
  restaurant_name  | locality_id | restaurant_type | rating |    street_address    | avg_cost_per_person
-------------------+-------------+-----------------+--------+----------------------+--------------------
 Dine Ten          |           1 | Indian          |      4 | Sola Road            |                 400
 Satkar            |           1 | Continental     |    4.2 | Riverfront Road      |                 460
 Furat             |           1 | Hybrid          |    4.5 | 132 ft. Ring Road    |                 550
 Atithi            |           2 | Indian          |    3.8 | Iscon                |                 370
 Village Vatika    |           2 | Indian          |    4.2 | Bodakdev             |                 480
 Shiva`s Cafe      |           3 | Hybrid          |    3.7 | Road A               |                 320
 Chang`s Kitchen   |           4 | Chinese         |    4.6 | Road B               |                 540
 Danny`s Coffe Bar |           5 | Hybrid          |    3.7 | Sargam Marg          |                 320
 Chang`s Kitchen   |           5 | Chinese         |    4.6 | 100 ft. Road         |                 540
 McDonalds         |           6 | Hybrid          |    4.5 | Shashtri Nagar       |                 520
 Uncle Sam`s Pizza |           6 | Continental     |    4.1 | IIIT Road            |                 420
 Dine Ten          |           7 | Indian          |      4 | IIIT Road            |                 400
 Satkar            |           7 | Continental     |    4.2 | Sayaji Park          |                 460
 Village Vatika    |           8 | Indian          |    4.2 | MS Uniersity Road    |                 480
 Shiva`s Cafe      |           8 | Hybrid          |    3.7 | Street I             |                 320
 Chang`s Kitchen   |           9 | Chinese         |    4.6 | Vaghodiya Road       |                 560
 Danny`s Coffe Bar |           9 | Hybrid          |    3.7 | 100 ft. Ring Road    |                 320
 Chang`s Kitchen   |          10 | Chinese         |    4.6 | Street L             |                 560
 McDonalds         |          10 | Hybrid          |    4.5 | Street M             |                 520
 Dine Ten          |          11 | Indian          |      4 | Road S               |                 400
 Satkar            |          11 | Continental     |    4.2 | Road T               |                 460
 Village Vatika    |          12 | Indian          |    4.2 | Taapi Street         |                 480
 Shiva`s Cafe      |          13 | Hybrid          |    3.7 | Bardoli Street       |                 320
 Chang`s Kitchen   |          13 | Chinese         |    4.6 | Dandi March Road     |                 560
 Shiva`s Cafe      |          14 | Hybrid          |    3.7 | Church Gate          |                 320
 Danny`s Coffe Bar |          14 | Hybrid          |    3.7 | Chopati              |                 320
 Chang`s Kitchen   |          15 | Chinese         |    4.6 | M. G. Road           |                 560
 McDonalds         |          15 | Hybrid          |    4.5 | Street M             |                 520
 Chang`s Kitchen   |          16 | Chinese         |    4.6 | Street L             |                 560
 McDonalds         |          16 | Hybrid          |    4.5 | Street M             |                 520
 Dine Ten          |          17 | Indian          |      4 | IIIT Road            |                 400
 Satkar            |          17 | Continental     |    4.2 | Sayaji Park          |                 460
(32 rows)
```

List of all the tables

```
File  Edit  View  Search  Terminal  Help
201651017=> \dt
                    List of relations
    Schema     |       Name        | Type  |   Owner
---------------+-------------------+-------+------------
 trip_planner  | bus               | table | 201651017
 trip_planner  | busdeparturetime  | table | 201651017
 trip_planner  | busjourneyhours   | table | 201651017
 trip_planner  | busreservation    | table | 201651017
 trip_planner  | cabs              | table | 201651017
 trip_planner  | cabservice        | table | 201651017
 trip_planner  | cabserviceinacity | table | 201651017
 trip_planner  | cabtype           | table | 201651017
 trip_planner  | city              | table | 201651017
 trip_planner  | hotel             | table | 201651017
 trip_planner  | hotelreservation  | table | 201651017
 trip_planner  | locality          | table | 201651017
 trip_planner  | nearbycities      | table | 201651017
 trip_planner  | placestovisit     | table | 201651017
 trip_planner  | restaurants       | table | 201651017
 trip_planner  | train             | table | 201651017
 trip_planner  | traindeparturetime| table | 201651017
 trip_planner  | trainjourneyhours | table | 201651017
 trip_planner  | trainreservation  | table | 201651017
 trip_planner  | typeofroom        | table | 201651017
(20 rows)

201651017=>
```

Functional Dependencies

Train

- **Train**(<u>train_id</u>, train_name)
    - train_id ---> train_name
    - **Normal Form :** BCNF
- **TrainDepartureTime**(<u>train_id</u>, <u>source</u>, departure_time)
    - {train_id, source} ---> departure_time
    - **Normal Form :** BCNF
- **TrainReservation**(<u>train_id</u>, <u>class</u>, <u>source</u>, <u>destination</u>, <u>departure_date</u>, fare, train_status, no_of_seats)
    - {train_id, ClassId, source, destination, Date} ---> fare
    - {train_id, ClassId, source, destination, Date} ---> train_status
    - {train_id, ClassId, source, destination, Date} ---> no_of_seats
    - **Normal Form :** BCNF
- **TrainJourneyHours**(<u>train_id</u>, <u>source</u>, <u>destination</u>, journey_hours)
    - {train_id, source, destination} ---> journey_hours
    - **Normal Form :** BCNF

Cab

- **CabType**(<u>cab_type</u>)
    - **Normal Form :** BCNF
- **CabService**(<u>cab_service_id</u>, provider_name, contact_no, rating)
    - cab_service_id ---> provider_name
    - cab_service_id ---> contact_no
    - cab_service_id ---> rating
    - **Normal Form :** BCNF

- **CabServiceInACity**(<u>cab_service_id</u>, <u>city_name</u>)
  - **Normal Form :** BCNF
- **Cabs**(<u>cab_service_id</u>, <u>city_name</u>, <u>cab_type</u>, cost_per_day, total_available_cabs)
  - {cab_service_id, city_name, cab_type} ---> cost_per_day
  - {cab_service_id, city_name, cab_type} ---> total_available_cabs
  - **Normal Form :** BCNF

Bus

- **Bus**(<u>bus_id</u>, provider_name, is_ac, rating)
  - bus_id ---> provider_name
  - bus_id ---> is_ac
  - bus_id ---> rating
  - **Normal Form :** BCNF
- **BusDepartureTime**(<u>bus_id</u>, <u>source</u>, <u>departure_date</u>, time_of_departure)
  - {bus_id, source, departure_date} ---> time_of_departure
  - **Normal Form :** BCNF
- **BusJourneyHours**(<u>bus_id</u>, <u>source</u>, <u>destination</u>, <u>departure_date</u>, journey_hours)
  - {bus_id, source, destination, departure_date} ---> journey_hours
  - **Normal Form :** BCNF
- **BusReservation**(<u>bus_id</u>, <u>source</u>, <u>destination</u>, <u>departure_date</u>, <u>seat_type</u>, cost, total_available_seats)
  - {bus_id, source, destination, departure_date, seat_type} ---> cost
  - {bus_id, source, destination, departure_date, seat_type} ---> total_available_seats
  - **Normal Form :** BCNF

City

- **City**(city_name)
  - **Normal Form :** BCNF
- **NearByCity**(current_city, nearby_city)
  - **Normal Form :** BCNF

Locality

- **Locality**(locality_id, locality_name, city_name)
  - locality_id ---> locality_name
  - locality_id ---> city_name
  - **Normal Form :** BCNF

Place to visit

- **PlacesToVisit**(place_name, locality_id, place_type, description_of_the_place, rating, street_address, avg_cost_person)
  - {place_name, locality_id} ---> place_type
  - {place_name, locality_id} ---> description_of_the_place
  - {place_name, locality_id} ---> rating
  - {place_name, locality_id} ---> street_address
  - {place_name, locality_id} ---> avg_cost_person
  - **Normal Form :** BCNF

Hotels

- **Hotels**(<u>hotel_name</u>, <u>locality_id</u>, rating, street_address, is_room_service, contact_no)
    - {hotel_name, locality_id} ---> rating
    - {hotel_name, locality_id} ---> street_address
    - {hotel_name, locality_id} ---> is_room_service
    - {hotel_name, locality_id} ---> contact_no
    - **Normal Form :** BCNF
- **HotelReservation**(<u>hotel_name</u>, <u>locality_id</u>, <u>date_of_availability</u>, <u>room_type</u>, total_available_rooms, cost)
    - {hotel_name, locality_id, date_of_availability, RoomType} ---> total_available_rooms
    - {hotel_name, locality_id, date_of_availability, RoomType} ---> cost
    - **Normal Form :** BCNF
- **TypeOfRoom**(<u>room_type</u>, max_accomodation)
    - room_type ---> max_accomodation
    - **Normal Form :** BCNF

Restaurants

- **Restaurants**(<u>restaurant_name</u>, <u>locality_id</u>, restaurant_type, rating, street_address, AvgRate/Person)
    - {restaurant_name, locality_id} ---> restaurant_type
    - {restaurant_name, locality_id} ---> rating
    - {restaurant_name, locality_id} ---> street_address
    - {restaurant_name, locality_id} ---> AvgRate/Person
    - **Normal Form :** BCNF

Queries

1. List all the cities which have more than 3 historical places to visit.

Ans1)

$a \leftarrow \text{Bus} \bowtie_{<\text{Bus.locality\_id=PlacesToVisit.locality\_id}>} \text{PlacesToVisit}$

$b \leftarrow \sigma_{<\text{type = 'Educational'}>}(a)$

$c \leftarrow {}_{\text{city\_name}}\mathcal{G}_{\text{count(city\_name)}} (b) \text{ HAVING}_{<\text{ᴝ<count> >=3}>}$

$D \leftarrow \pi_{<\text{city\_name}>}(c)$

```sql
SELECT
      distinct city_name
from
      Locality as l
      join PlacesToVisit as ptv ON (l.locality_id = ptv.locality_id)
WHERE
      place_type = 'Historical'
group by(city_name)
HAVING
      count(city_name) >= 3;
```

```
201651017=> SELECT
201651017->
201651017->     distinct city_name
201651017->
201651017-> from
201651017->
201651017->     Locality as l
201651017->
201651017->     join PlacesToVisit as ptv ON (l.locality_id = ptv.locality_id)
201651017->
201651017-> WHERE
201651017->
201651017->     place_type = 'Historical'
201651017->
201651017-> group by(city_name)
201651017->
201651017-> HAVING
201651017->
201651017->     count(city_name) >= 3;
 city_name
-----------
 Ahmedabad
(1 row)
```

2. AC buses between Ahmedabad and Mumbai on date 17th April, 2018.

Ans 2)

$a \leftarrow Bus \bowtie_{<Bus.bus\_id=BusReservation.bus\_id>} BusReservation$

$b \leftarrow \sigma_{<source = 'Ahmedabad' \text{ and } destination = 'Mumbai' \text{ and } is\_active = True \text{ and } date = '2018-4-17'>}(a)$

$c \leftarrow \pi_{<bus\_id, bus\_service\_provider>}(c)$

```
SELECT
      b.bus_id,
      b.bus_service_provider
from
      Bus as b
      join BusReservation as br on (b.bus_id = br.bus_id)
where
      source = 'Ahmedabad'
      and destination = 'Mumbai'
      and departure_date = '2018-04-17'
      and is_ac = True;
```

```
201651017=> SELECT
201651017->      distinct b.bus_id,
201651017->      b.bus_service_provider
201651017-> from
201651017->      Bus as b
201651017->      join BusReservation as br on (b.bus_id = br.bus_id)
201651017-> where
201651017->      source = 'Ahmedabad'
201651017->      and destination = 'Mumbai'
201651017->      and departure_date = '2018-04-17'
201651017->      and is_ac = True;
 bus_id | bus_service_provider
--------+---------------------
 GJ1001 | Underwoods
(1 row)
```

3. Cities in which intra city traveling cost is greater than travelling to these cities with Ahmedabad as source.

Ans 3)

$a \leftarrow \sigma_{<source = 'Ahmedabad'>}(BusReservation)$

$b \leftarrow \sigma_{<source = 'Ahmedabad'>}(TrainReservation)$

$c \leftarrow a \cup b$

$d \leftarrow {}_{destination}\mathcal{G}_{min(cost)\ as\ min\_inter\_cost}(x)$

$e \leftarrow {}_{city\_name}\mathcal{G}_{min(cost\_per\_day)\ as\ minn\_intra\_cost}(Cabs)$

$f \leftarrow d \bowtie_{<destination\ =\ city\_name>} e$

$g \leftarrow \sigma_{<min\_intra\_cost\ >\ min\_inter\_cost>}(f)$

$h \leftarrow \pi_{<city\_name>}(g)$

```
SELECT
      city_name
FROM
      (
      SELECT
            destination,
            min(cost) as min_inter_cost
      from
            (
```

```sql
                SELECT
                bus_id,
                NULL as train_id,
                source,
                destination,
                cost
                from
                BusReservation
                where
                source = 'Ahmedabad'
                union
                SELECT
                NULL as bus_id,
                train_id,
                source,
                destination,
                fare as  cost
                from
                TrainReservation
                where
                source = 'Ahmedabad'
        ) as joined
    group by
        (destination)
    ) as inter_query
    join (
    SELECT
        city_name,
        min(cost_per_day) as min_intra_cost
    from
        Cabs
    group by
        (city_name)
    ) as intra_query on (inter_query.destination = intra_query.city_name)
where
    min_intra_cost > min_inter_cost;
```

```
201651017=> SELECT
201651017->     city_name
201651017-> FROM
201651017->     (
201651017(>         SELECT
201651017(>             destination,
201651017(>             min(cost) as min_inter_cost
201651017(>         from
201651017(>             (
201651017(>                 SELECT
201651017(>                     bus_id,
201651017(>                     NULL as train_id,
201651017(>                     source,
201651017(>                     destination,
201651017(>                     cost
201651017(>                 from
201651017(>                     BusReservation
201651017(>                 where
201651017(>                     source = 'Ahmedabad'
201651017(>                 union
201651017(>                 SELECT
201651017(>                     NULL as bus_id,
201651017(>                     train_id,
201651017(>                     source,
201651017(>                     destination,
201651017(>                     fare as  cost
201651017(>                 from
201651017(>                     TrainReservation
201651017(>                 where
201651017(>                     source = 'Ahmedabad'
201651017(>             ) as joined
201651017(>         group by
201651017(>             (destination)
201651017(>     ) as inter_query
201651017->     join (
201651017(>         SELECT
201651017(>             city_name,
201651017(>             min(cost_per_day) as min_intra_cost
201651017(>         from
201651017(>             Cabs
201651017(>         group by
201651017(>             (city_name)
201651017(>     ) as intra_query on (inter_query.destination = intra_query.city_name)
201651017-> where
201651017->     min_intra_cost > min_inter_cost;
```

```
201651017-> where
201651017->     min_intra_cost > min_inter_cost;
 city_name
-----------
 Ujjain
 Mumbai
 Vadodara
 Surat
(4 rows)
```

4. Restaurants near the cheapest hotel in Ahmedabad.

Ans 4)

$a \leftarrow$ hotels $\bowtie_{<hotel.locality\_id=locality.locality\_id>}$ locality

$b \leftarrow \sigma_{<city\_name = \text{"Ahmedabad"}>}(a)$

$c \leftarrow \pi_{<min(cost)>}(b)$

$d \leftarrow \sigma_{<cost\ in\ c\ and\ city\_name = \text{"Ahmedabad"}>}(b)$

$e \leftarrow d \bowtie_{<d.locality\_id=Restaurants.locality\_id>}$ Restaurants

$f \leftarrow \pi_{<city\_name>}(e)$

```
SELECT
      restaurant_name,
      cheapest_hotel.locality_id,
      cheapest_hotel.hotel_name
from
      (
      SELECT
            l.locality_id,
            hr.hotel_name,
            cost
      from
            HotelReservation as hr
            join Locality as l on (hr.locality_id = l.locality_id)
      where
            cost in (
                  SELECT
                  min(cost)
                  from
                  HotelReservation as hr
                  join Locality as l on (hr.locality_id = l.locality_id)
                  where
                  city_name = 'Ahmedabad'
            )
            and city_name = 'Ahmedabad'
      ) as cheapest_hotel
      JOIN Restaurants as r on(cheapest_hotel.locality_id = r.locality_id);
```

```
201651017=> SELECT
201651017->     restaurant_name,
201651017->     cheapest_hotel.locality_id,
201651017->     cheapest_hotel.hotel_name
201651017-> from
201651017->     (
201651017(>         SELECT
201651017(>             l.locality_id,
201651017(>             hr.hotel_name,
201651017(>             cost
201651017(>         from
201651017(>             HotelReservation as hr
201651017(>             join Locality as l on (hr.locality_id = l.locality_id)
201651017(>         where
201651017(>             cost in (
201651017(>                 SELECT
201651017(>                     min(cost)
201651017(>                 from
201651017(>                     HotelReservation as hr
201651017(>                     join Locality as l on (hr.locality_id = l.locality_id)
201651017(>                 where
201651017(>                     city_name = 'Ahmedabad'
201651017(>             )
201651017(>             and city_name = 'Ahmedabad'
201651017(>     ) as cheapest_hotel
201651017->     JOIN Restaurants as r on(cheapest_hotel.locality_id = r.locality_id);
 restaurant_name | locality_id |  hotel_name
-----------------+-------------+---------------
 Dine Ten        |           1 | Hotel Economy
 Furat           |           1 | Hotel Economy
 Satkar          |           1 | Hotel Economy
(3 rows)
```

5 . All means to travel from Ahmedabad to the city which can be reached in minimum time (from Ahmedabad).

ANS 5)

$a \leftarrow \sigma_{<source = \text{"Ahmedabad"}>}(\text{BusJourneyHours})$

$b \leftarrow \sigma_{<source = \text{"Ahmedabad"}>}(\text{TrainJourneyHours})$

$c \leftarrow a \cup b$

$d \leftarrow \pi_{<min(journey\_hours)>}(c)$

$e \leftarrow \sigma_{<journey\_hours\ in\ d>}(c)$

$f \leftarrow \pi_{<bus\_id,\ train\_id,\ destination,\ journey\_hours>}(e)$

```sql
SELECT
      bus_id,
      train_id,
      journey_hours
from
      (
      SELECT
            bus_id,
            NULL as train_id,
            source,
            destination,
            journey_hours
      from
            BusJourneyHours
      where
            source = 'Ahmedabad'
      UNION
      SELECT
            NULL as bus_id,
            train_id,
            source,
            destination,
            journey_hours
      from
            TrainJourneyHours
      where
            source = 'Ahmedabad'
      ) as all_travel_details
where
      journey_hours in (
      SELECT
            min(journey_hours)
      from
            (
                  SELECT
                  bus_id,
                  NULL as train_id,
                  source,
                  destination,
                  journey_hours
                  from
                  BusJourneyHours
                  where
```

```sql
            source = 'Ahmedabad'
            UNION
            SELECT
            NULL as bus_id,
            train_id,
            source,
            destination,
            journey_hours
            from
            TrainJourneyHours
            where
            source = 'Ahmedabad'
        ) as min_journey_cost
    );
```

```sql
201651017=> SELECT
201651017->     bus_id,
201651017->     train_id,
201651017->     all_travel_details.destination,
201651017->     journey_hours
201651017-> from
201651017->     (
201651017(>         SELECT
201651017(>             bus_id,
201651017(>             NULL as train_id,
201651017(>             source,
201651017(>             destination,
201651017(>             journey_hours
201651017(>         from
201651017(>             BusJourneyHours
201651017(>         where
201651017(>             source = 'Ahmedabad'
201651017(>         UNION
201651017(>         SELECT
201651017(>             NULL as bus_id,
201651017(>             train_id,
201651017(>             source,
201651017(>             destination,
201651017(>             journey_hours
201651017(>         from
201651017(>             TrainJourneyHours
201651017(>         where
201651017(>             source = 'Ahmedabad'
201651017(>     ) as all_travel_details
201651017-> where
201651017->     journey_hours in (
201651017(>         SELECT
201651017(>             min(journey_hours)
201651017(>         from
201651017(>             (
201651017(>                 SELECT
201651017(>                     bus_id,
201651017(>                     NULL as train_id,
201651017(>                     source,
201651017(>                     destination,
201651017(>                     journey_hours
201651017(>                 from
201651017(>                     BusJourneyHours
201651017(>                 where
201651017(>                     source = 'Ahmedabad'
```

```
201651017(>                                journey_hours
201651017(>                        from
201651017(>                                BusJourneyHours
201651017(>                        where
201651017(>                                source = 'Ahmedabad'
201651017(>                        UNION
201651017(>                        SELECT
201651017(>                                NULL as bus_id,
201651017(>                                train_id,
201651017(>                                source,
201651017(>                                destination,
201651017(>                                journey_hours
201651017(>                        from
201651017(>                                TrainJourneyHours
201651017(>                        where
201651017(>                                source = 'Ahmedabad'
201651017(>                ) as min_journey_cost
201651017(>        );
 bus_id | train_id | destination | journey_hours
--------+----------+-------------+----------------
        |     1501 | Vadodara    |              2
 GJ1003 |          | Vadodara    |              2
 GJ1002 |          | Vadodara    |              2
 GJ1004 |          | Vadodara    |              2
 GJ1001 |          | Vadodara    |              2
(5 rows)
```

6. Find restaurants which are nearby to the highest rated place to visit in Ahmedabad.

Ans 6)

a ← PlacesToVisit ⋈$_{<PlacesToVisit.locality\_id=Locality.locality\_id>}$ Locality

b ← σ$_{<city\_name = "Ahmedabad">}$(a)

c ← π$_{<max(rating)>}$(b)

d ← σ$_{<cost\ in\ c\ and\ city\_name = "Ahmedabad">}$(b)

e ← d ⋈$_{<d.locality\_id=Restaurants.locality\_id>}$ Restaurants

$$f \leftarrow \pi_{<place\_name,\ restaurant\_name>}(e)$$

```sql
SELECT
    place_name,
    restaurant_name
FROM
    (
    SELECT
        place_name,
        l.locality_id,
        l.city_name
    from
        PlacesToVisit as ptv
        join Locality as l on (l.locality_id = ptv.locality_id)
    where
        rating in (
            SELECT
            max(ptv.rating)
            from
            PlacesToVisit as ptv
            join Locality as l on (l.locality_id = ptv.locality_id)
            where
            city_name = 'Ahmedabad'
        )
    ) as max_rated_place
    JOIN Restaurants as rest on (rest.locality_id =
max_rated_place.locality_id)
where
    max_rated_place.city_name = 'Ahmedabad';
```

```
201651017=> SELECT
201651017->     place_name,
201651017->     restaurant_name
201651017-> FROM
201651017->     (
201651017(>         SELECT
201651017(>             place_name,
201651017(>             l.locality_id,
201651017(>             l.city_name
201651017(>         from
201651017(>             PlacesToVisit as ptv
201651017(>             join Locality as l on (l.locality_id = ptv.locality_id)
201651017(>         where
201651017(>             rating in (
201651017(>                 SELECT
201651017(>                     max(ptv.rating)
201651017(>                 from
201651017(>                     PlacesToVisit as ptv
201651017(>                     join Locality as l on (l.locality_id = ptv.locality_id)
201651017(>                 where
201651017(>                     city_name = 'Ahmedabad'
201651017(>             )
201651017(>     ) as max_rated_place
201651017->     JOIN Restaurants as rest on (rest.locality_id = max_rated_place.locality_id)
201651017-> where
201651017->     max_rated_place.city_name = 'Ahmedabad';
   place_name    | restaurant_name
-----------------+-----------------
 Riverfront      | Dine Ten
 Riverfront      | Furat
 Riverfront      | Satkar
 Kankariya Lake  | Dine Ten
 Kankariya Lake  | Furat
 Kankariya Lake  | Satkar
(6 rows)
```

7. Find those hotels in Ahmedabad, which have those rooms available that can accomodate more than 1 person.

Ans 7)

a ← HotelReservation $\bowtie_{<HotelReservation.room\_type = TypeOfRoom.room\_type>}$ TypeOfRoom

b ← a $\bowtie_{<a.locality\_id = Locality.locality\_id>}$ Locality

c ← $\sigma_{<city\_name = \text{"Ahmedabad" and max\_accomodation} > 1 \text{ and total\_available\_rooms} > 1>}$(b)

d ← $\pi_{<distinct\ hote\_name,\ room\_type>}$(c)

```sql
SELECT
      DISTINCT hotel_name,
      tor.room_type
from
      HotelReservation as hr
      join TypeOfRoom as tor on (hr.room_type = tor.room_type)
      join Locality as l on (l.locality_id = hr.locality_id)
where
      city_name = 'Ahmedabad'
      and max_accomodation > 1
      and total_available_rooms > 1;
```

```
201651017=> SELECT
201651017->     DISTINCT hotel_name,
201651017->     tor.room_type
201651017-> from
201651017->     HotelReservation as hr
201651017->     join TypeOfRoom as tor on (hr.room_type = tor.room_type)
201651017->     join Locality as l on (l.locality_id = hr.locality_id)
201651017-> where
201651017->     city_name = 'Ahmedabad'
201651017->     and max_accomodation > 1
201651017->     and total_available_rooms > 1;
    hotel_name     | room_type
-------------------+-----------
 BB Hotel          | Double Bed
 Hotel Economy     | Double Bed
 Hotel Shahnamah   | Double Bed
 The Bhai Hotel    | Double Bed
 Hotel Bollywood   | Double Bed
 Hotel Piku        | Double Bed
 Renaissance Hotel | Double Bed
(7 rows)
```

8. All those cab service providers who can provide a 'sedan' cab in Ahmedabad.

Ans 8)

$a \leftarrow Cabs \bowtie_{<Cabs.cab\_service\_id=CabService.cab\_service\_id>} CabService$

$b \leftarrow \sigma_{<cab\_type = \text{"sedan" and city\_name = "Ahmedabad"}>}(a)$

$c \leftarrow \pi_{<cab\_service\_id, provider\_name>}(b)$

```
SELECT
      c.cab_service_id,
      cs.provider_name
from
      Cabs as c
      join CabService as cs on (cs.cab_service_id = c.cab_service_id)
where
      cab_type = 'Sedan'
      and city_name = 'Ahmedabad';
```

```
201651017=> SELECT
201651017->      c.cab_service_id,
201651017->      cs.provider_name
201651017-> from
201651017->      Cabs as c
201651017->      join CabService as cs on (cs.cab_service_id = c.cab_service_id)
201651017-> where
201651017->      cab_type = 'Sedan'
201651017->      and city_name = 'Ahmedabad';
 cab_service_id | provider_name
----------------+---------------
 C101           | Uber
 C102           | Ola
 C103           | Jugnoo
(3 rows)
```

9. List all the cities which have at least one historical place to visit.

Ans 9)

$a \leftarrow$ PlacesToVisit $\bowtie_{<PlaceToVIsit.cab\_service\_id=Locality.cab\_service\_id>}$ Locality

$b \leftarrow \sigma_{<place\_type = 'Historical'>}(a)$

$c \leftarrow {}_{city\_name}\mathcal{G}$ (b) HAVING$_{<\mathfrak{I}<count >= 1>}$

$d \leftarrow \pi_{<city\_name>}(c)$

```
SELECT
      city_name
from
      PlacesToVisit as ptv
      join Locality as l on (ptv.locality_id = l.locality_id)
where
      place_type = 'Historical'
GROUP by(city_name)
HAVING
      count(place_type) >= 1;
```

```
201651017=> SELECT
201651017->      city_name
201651017-> from
201651017->      PlacesToVisit as ptv
201651017->      join Locality as l on (ptv.locality_id = l.locality_id)
201651017-> where
201651017->      place_type = 'Historical'
201651017-> GROUP by(city_name)
201651017-> HAVING
201651017->      count(place_type) >= 1;
 city_name
-----------
 Ahmedabad
 Surat
 Gwalior
 Vadodara
 Mumbai
(5 rows)
```

10. All those buses traveling between from Ahmedabad to the city whose total no. of places to visit are greater than 3

And 10)

$a \leftarrow$ PlacesToVisit $\bowtie_{<PlaceToVIsit.cab\_service\_id=Locality.cab\_service\_id>}$ Locality

$b \leftarrow {}_{city\_name}\mathcal{G}$ (a) $\text{HAVING}_{<\mathcal{I}<count >= 3>}$

$c \leftarrow b \bowtie_{<destination = city\_name>}$ BusJourneyHours

$d \leftarrow c \bowtie_{<c.bus\_id = Bus.bus\_id>}$ Bus

$e \leftarrow \sigma_{<source = "Ahmedabad">}(d)$

$f \leftarrow \pi_{<distinct bus\_id, bus\_service\_provider, city\_name>}(e)$

```sql
SELECT
    distinct b.bus_id,
    b.bus_service_provider,
    places.city_name
from
    (
    SELECT
        city_name
    from
        PlacesToVisit as ptv
        join Locality as l on(l.locality_id = ptv.locality_id)
    group by
        (city_name)
    HAVING
        count(city_name) >= 3
    ) as places
    join BusJourneyHours as bj on (bj.destination = places.city_name)
    join Bus as b on (b.bus_id = bj.bus_id)
where
    source = 'Ahmedabad';
```

```
201651017=> SELECT
201651017->     distinct b.bus_id,
201651017->     b.bus_service_provider,
201651017->     places.city_name
201651017-> from
201651017->     (
201651017(>         SELECT
201651017(>             city_name
201651017(>         from
201651017(>             PlacesToVisit as ptv
201651017(>             join Locality as l on(l.locality_id = ptv.locality_id)
201651017(>         group by
201651017(>             (city_name)
201651017(>         HAVING
201651017(>             count(city_name) >= 3
201651017(>     ) as places
201651017->     join BusJourneyHours as bj on (bj.destination = places.city_name)
201651017->     join Bus as b on (b.bus_id = bj.bus_id)
201651017-> where
201651017->     source = 'Ahmedabad';
 bus_id | bus_service_provider | city_name
--------+----------------------+-----------
 GJ1001 | Underwoods           | Mumbai
 GJ1001 | Underwoods           | Surat
 GJ1002 | Underwoods           | Vadodara
 GJ1004 | Underwoods           | Vadodara
 GJ1003 | Underwoods           | Surat
 GJ1003 | Underwoods           | Vadodara
 GJ1001 | Underwoods           | Vadodara
 GJ1002 | Underwoods           | Surat
 GJ1002 | Underwoods           | Mumbai
(9 rows)
```

11. All those cab service providers whose rating is greater than 3 and who provide a 'hatchback' cab in those cities which have a Hotel Shahnamah.

Ans 11)

$a \leftarrow$ Hotel $\bowtie_{<Hotel.locality\_id = Locality.locality\_id>}$ Locality

$b \leftarrow \sigma_{<hotel\_name = \text{'Hotel Shahnamah'}>}(a)$

$c \leftarrow b \bowtie_{<b.city\_type = Cabs.city\_type>}$ Cabs

$d \leftarrow c \bowtie_{<c.cab\_type = CabType.cab\_type>}$ CabType

$e \leftarrow d \bowtie_{<d.cab\_service\_id = CabService.cab\_service\_id>}$ CabService

$f \leftarrow \sigma_{<rating > 3 \text{ and } cab\_type = \text{'Hatchback'}>}(e)$

$$g \leftarrow \pi_{<provider\_name,\ city\_name>}(f)$$

```sql
SELECT
      cs.provider_name,
      c.city_name
from
      (
      SELECT
            *
      from
            Hotel as h
            join Locality as l on (l.locality_id = h.locality_id)
      where
            hotel_name = 'Hotel Shahnamah'
      ) as hotel_sham
      join Cabs as c on (c.city_name = hotel_sham.city_name)
      join cabtype  as ct on (c.cab_type = ct.cab_type)
      join cabservice as cs on (cs.cab_service_id = c.cab_service_id)
where
      cs.rating > 3
      and ct.cab_type = 'HatchBack';
```

```
201651017=> SELECT
201651017->     cs.provider_name,
201651017->     c.city_name
201651017-> from
201651017->     (
201651017(>         SELECT
201651017(>             *
201651017(>         from
201651017(>             Hotel as h
201651017(>             join Locality as l on (l.locality_id = h.locality_id)
201651017(>         where
201651017(>             hotel_name = 'Hotel Shahnamah'
201651017(>     ) as hotel_sham
201651017->     join Cabs as c on (c.city_name = hotel_sham.city_name)
201651017->     join cabtype   as ct on (c.cab_type = ct.cab_type)
201651017->     join cabservice as cs on (cs.cab_service_id = c.cab_service_id)
201651017-> where
201651017->     cs.rating > 3
201651017->     and ct.cab_type = 'HatchBack';
 provider_name | city_name
---------------+-----------
 Uber          | Ahmedabad
 Ola           | Ahmedabad
 Jugnoo        | Ahmedabad
 GozoCabs      | Ahmedabad
 Savaari       | Ahmedabad
 Uber          | Mumbai
 Ola           | Mumbai
 Jugnoo        | Mumbai
 GozoCabs      | Mumbai
 Savaari       | Mumbai
 Uber          | Gwalior
 Ola           | Gwalior
(12 rows)
```

12. All those hotels which have rating greater than 4 located in the city which is nearby to Ahmedabad and has min. bus travelling cost (in a bus with available seats) with Ahmedabad as source .

Ans 12)

$a \leftarrow$ BusReservation $\bowtie_{<destination = nearby\_city>}$ NearbyCities

$b \leftarrow \sigma_{<source =\text{'Ahmedabad' and current\_city = 'Ahmedabad'}>}(a)$

$c \leftarrow \pi_{<min(cost)>}(b)$

$d \leftarrow \sigma_{<cost\ in\ c>}(b)$

$e \leftarrow$ Hotel $\bowtie_{\text{<Hotel.locality\_id= Locality.locality\_id>}}$ Locality

$f \leftarrow \pi_{\text{<hotel\_name, city\_name, rating>}}(e)$

$g \leftarrow c \bowtie_{\text{<city\_name = destination>}} f$

$h \leftarrow \sigma_{\text{<c,rating > 4>}}(g)$

$i \leftarrow \pi_{\text{<hotel\_name, city\_name>}}(h)$

```sql
SELECT
     hotel_name,city_name
from
     (
     SELECT
          destination
     from
          BusReservation as br
          join NearbyCities as nc on(br.destination = nc.nearby_city)
     where
          br.cost in (
                 SELECT
                 min(cost)
                 from
                 BusReservation as br
                 join NearbyCities as nc on(br.destination =
nc.nearby_city)
                 where
                 br.source = 'Ahmedabad'
                 and nc.current_city = 'Ahmedabad'
          )
          and br.source = 'Ahmedabad'
          and nc.current_city = 'Ahmedabad'
     ) as min_cost_city
     join (
     SELECT
          hotel_name,
          city_name,
          h.rating
     from
          hotel as h
          join locality as l on (l.locality_id = h.locality_id)
     ) as hotel_info on (
     hotel_info.city_name = min_cost_city.destination
     )
```

```
        where hotel_info.rating >= 4;
201651017=> SELECT
201651017->     hotel_name,city_name
201651017-> from
201651017->     (
201651017(>         SELECT
201651017(>             destination
201651017(>         from
201651017(>             BusReservation as br
201651017(>             join NearbyCities as nc on(br.destination = nc.nearby_city)
201651017(>         where
201651017(>             br.cost in (
201651017(>                 SELECT
201651017(>                     min(cost)
201651017(>                 from
201651017(>                     BusReservation as br
201651017(>                     join NearbyCities as nc on(br.destination = nc.nearby_city)
201651017(>                 where
201651017(>                     br.source = 'Ahmedabad'
201651017(>                     and nc.current_city = 'Ahmedabad'
201651017(>             )
201651017(>             and br.source = 'Ahmedabad'
201651017(>             and nc.current_city = 'Ahmedabad'
201651017(>     ) as min_cost_city
201651017->     join (
201651017(>         SELECT
201651017(>             hotel_name,
201651017(>             city_name,
201651017(>             h.rating
201651017(>         from
201651017(>             hotel as h
201651017(>             join locality as l on (l.locality_id = h.locality_id)
201651017(>     ) as hotel_info on (
201651017(>         hotel_info.city_name = min_cost_city.destination
201651017(>     )
201651017->     where hotel_info.rating >= 4;
    hotel_name     | city_name
-------------------+-----------
 The New Age Hotel | Vadodara
 The Namo Hotel    | Vadodara
 Renaissance Hotel | Vadodara
(3 rows)
```