Mini Project Synopsis

HOTEL MANAGEMENT SYSTEM

Submitted as a part of course curriculum for

CORE COURSE IN

DATABASE MANAGEMENT SYSTEM

Under the guidance of
Prof Nivedita Kasturi

Submitted by -:
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Problem Statement -:

To create an efficient Hotel (lodge + restaurant) management system. The main objective is to manage the details of employees, bookings, guests at the lodge and customers at the restaurant, rooms, order, bill, etc. A customer can make reservations, change, or cancel reservations through the hotel website. When a customer makes reservations, based on availability employee allots room.

Choice Of DBMS -:

We have chosen RDBMS (Relational Database Management System) for our project. This is because, in RDBMS, we have a specific schema to follow which helps us to write front end code in accordance and by just looking at the rows and columns we can infer a lot of information. We also have data types to ensure data in a given column is well-formed. CHECK constraints can further validate data. We can also use declarative constraints like NOT NULL, UNIQUE KEY, FOREIGN KEY, etc. Authentication and access privileges are handled better here.

We have chosen psql from the list of RDBMSs available as it is open source, diverse community and indexing techniques, ACID (Atomicity, Consistency, Isolation, Durability) and transaction. It is an object-relational database, while MySQL is a purely relational database. This means that Postgres includes features like table inheritance and function overloading. Postgres also adheres more closely to SQL standards. It handles concurrency better than MySQL. It supports parallel query plans and can create partial indexes (for example, if you have a model with soft deletes, you can create an index that ignores records marked as deleted). Its known for protecting data integrity at the transaction level which makes it less vulnerable to data corruption.

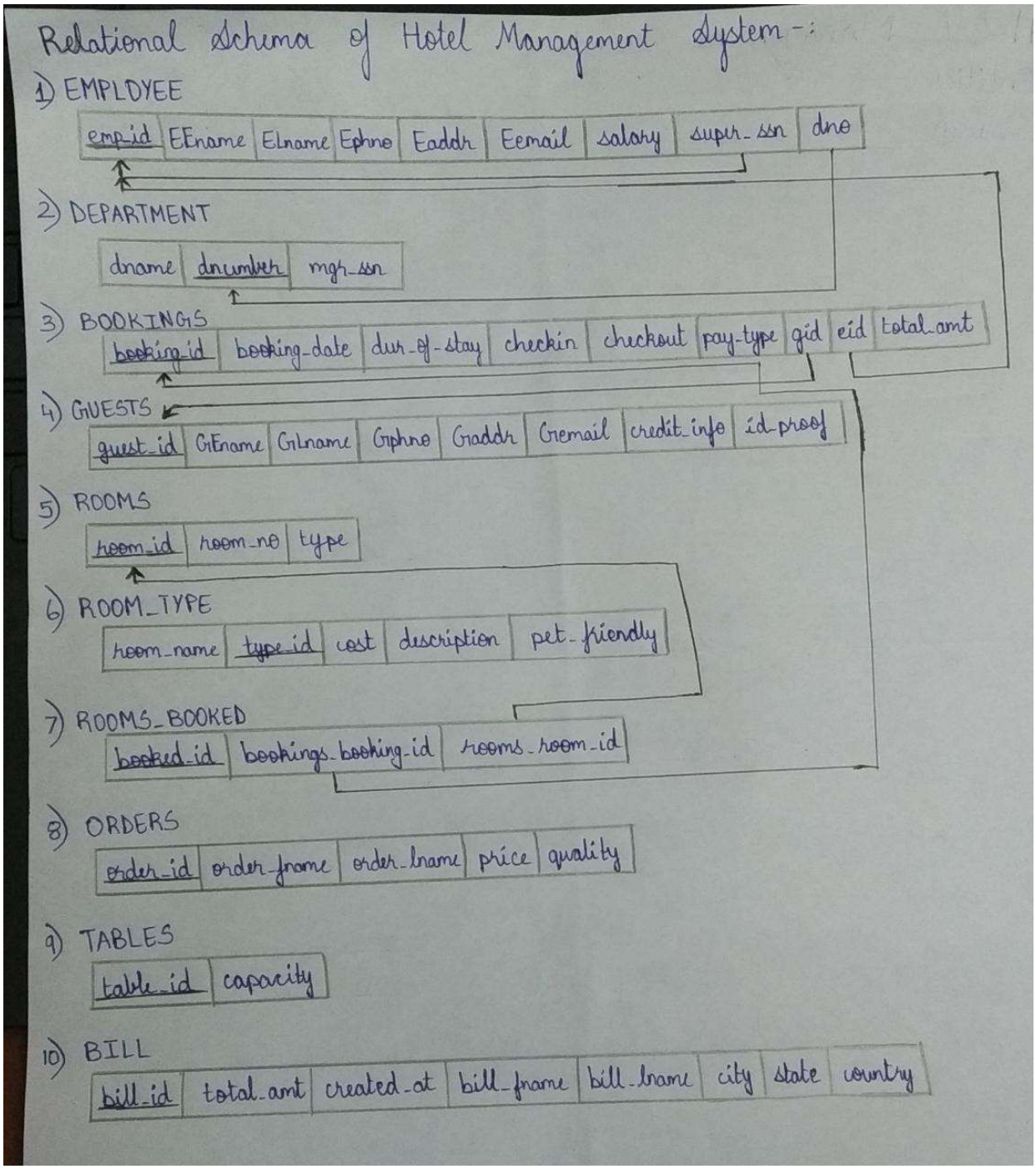
Mapping from ER model to Relational -:

First, we map the strong entities (such as Employee, Department, etc.) and underline their primary key. Then we map the weak entities (Rooms_booked). Map the 1:1 relations (like Order to Tables), then 1:N relationships (like

Employee and Department) and then M:N relationships (like Employee to Order). We then map the multivalued attributes and the N-ary relationships.

On following the above steps we obtained the below relation schema. The foreign keys are – super_ssn(refers to pk emp_id), dno (refers to dnumber), gid (refers to pk guest_id), eid (refers to pk emp_id), bookings_booking_id (refers to pk booking_id) and rooms_room_id (refers to pk room_id).

Relational Schema -:



Create commands -:

```
create database hotel_management;

\c hotel_management


create table employee ( emp_id int PRIMARY KEY, EFname varchar(255) NOT NULL, ELname varchar(255) NOT NULL, Ephno varchar(15), Eaddr varchar(255), Eemail varchar(255), salary float, Super_ssn int, Dno int );


create table department ( dname varchar(255), dnumber int PRIMARY KEY, mgr_ssn int);


create table bookings ( booking_id int PRIMARY KEY, booking_date date, dur_of_stay int, checkin date, checkout date, pay_type varchar(255), gid int UNIQUE NOT NULL, eid int UNIQUE NOT NULL, total_amt float NOT NULL);


create table guests ( guest_id int PRIMARY KEY NOT NULL, GFname varchar(255), GLname varchar(255), Gphno varchar(15), Gaddr varchar(255) NOT NULL, Gemail varchar(255), credit_info varchar(255), id_proof varchar(255) NOT NULL);


create table rooms ( room_id int PRIMARY KEY, room_no int, type varchar(255));


create table room_type( room_name varchar(255), type_id int PRIMARY KEY, cost float NOT NULL, description varchar(255), pet_friendly int );


create table rooms_booked ( booked_id int PRIMARY KEY, bookings_booking_id int, rooms_room_id int);
```

create table orders(order_id int PRIMARY KEY, order_fname varchar(255), order_lname varchar(255), price float, capacity int);

create table tables (table_id int PRIMARY KEY, capacity int);

create table bill (bill_id int PRIMARY KEY, total_amt float, created_at date, bill_fname varchar(255), bill_lname varchar(255), city varchar(255) default 'Bangalore', state varchar(255) default 'Karnataka', country varchar(255) default 'India');

alter table employee add FOREIGN KEY (super_ssn) REFERENCES employee (emp_id);

alter table employee add FOREIGN KEY (dno) REFERENCES department (dnumber);

alter table bookings add FOREIGN KEY (gid) REFERENCES guests (guest_id);

alter table bookings add FOREIGN KEY (eid) REFERENCES employee (emp_id);

alter table rooms_booked add FOREIGN KEY (bookings_booking_id) REFERENCES bookings (booking_id);

alter table rooms_booked add FOREIGN KEY (rooms_room_id) REFERENCES rooms (room_id);

Insert commands -:

\c hotel_management

INSERT into DEPARTMENT values ('Housekeeping', 1, 1);

INSERT into DEPARTMENT values ('Cooking', 2, 4);

INSERT into DEPARTMENT values ('Accounts', 3, 8);

```
INSERT into DEPARTMENT values ('Reception', 4, 12);

INSERT into DEPARTMENT values ('Security', 5, 16);

INSERT into DEPARTMENT values ('Electrical Maintenance', 6, 20);

INSERT into DEPARTMENT values ('First Aid', 7, 24);

INSERT into DEPARTMENT values ('Emergency', 8, 28);


INSERT into EMPLOYEE values (1, 'James', 'Borg', '888665555', '450 Stone, Houston,TX', 'james.borg@gmail.com', 55000, NULL, 1);

INSERT into EMPLOYEE values (2, 'John', 'Smith', '998665545', '731 Fondren,Houston,TX', 'john.smith@gmail.com', 35000, 1, 3);

INSERT into EMPLOYEE values (8, 'Ahmed', 'Jabber', '7786652533', '980 Dallas, Houston,TX', 'ahmed.jabber@gmail.com', 35000, NULL, 3);

INSERT into EMPLOYEE values (3, 'Franklin', 'Wong', '778665533', '638 voss,Houston,TX', 'franklin.wong@gmail.com', 30000, 8, 3);

INSERT into EMPLOYEE values (4, 'Alicia', 'Zelaya', '988455255', '3321 Castle,Spring,TX', 'alica.zelaya@yaahoo.com', 65000, NULL, 2);

INSERT into EMPLOYEE values (5, 'Jennifer', 'Wallace', '9867585821', '291 Berry, Bellaire,TX', 'jennifer@gmail.com', 45000, 2, 2);

INSERT into EMPLOYEE values (6, 'Ramesh', 'Narayan', '8884455920', '975 Fire Oak, Humble, TX', 'ramesh.narayan@gmail.com', 60000, 1, 1);

INSERT into EMPLOYEE values (7, 'Jonny', 'English', '998665533', '5631 Rice,Houston,TX', 'johnny.english@gmail.com', 60000, 1, 1);


INSERT into ROOMS values (1, 101, 'Single');

INSERT into ROOMS values (2, 102, 'Double');

INSERT into ROOMS values (3, 103, 'Double');

INSERT into ROOMS values (4, 104, 'Single');

INSERT into ROOMS values (5, 201, 'Single');

INSERT into ROOMS values (6, 201, 'Double');
```

```
INSERT into ROOMS values (7, 203, 'Triple');

INSERT into ROOMS values (8, 301, 'Double');

INSERT into ROOMS values (9, 302, 'Queen');

INSERT into ROOMS values (10, 303, 'Triple');

INSERT into ROOMS values (11, 304, 'Single');

INSERT into ROOMS values (12, 305, 'Double');


INSERT into ROOM_TYPE values ('Single', 21, 1200.00,'A room assigned to one person.', 0);

INSERT into ROOM_TYPE values ('Double', 22, 2000.50,'A room assigned to two people', 0);

INSERT into ROOM_TYPE values ('Triple', 23, 3500.25,'A room that can accommodate three persons', 1);

INSERT into ROOM_TYPE values ('Queen', 24, 5000.00,'A room with a queen-sized bed. May be occupied by one or more people.', 1);

INSERT into ROOM_TYPE values ('Single+Balcony', 25, 1500.00,'A room assigned to one person with a balcony', 0);

INSERT into ROOM_TYPE values ('Single+lakeview', 26, 1800.00,'A room assigned to one person with a beautiful view of the lake', 1);

INSERT into ROOM_TYPE values ('Double+Balcony', 27, 2300.00,'A room assigned to two people with a balcony', 0);

INSERT into ROOM_TYPE values ('Double+lakeview', 28, 2800.00,'A room assigned to two people with a beautiful view of the lake', 1);


INSERT into TABLES values (101, 2);

INSERT into TABLES values (102, 2);

INSERT into TABLES values (103, 2);

INSERT into TABLES values (104, 4);

INSERT into TABLES values (105, 4);
```

```
INSERT into TABLES values (106, 6);

INSERT into TABLES values (107, 6);

INSERT into TABLES values (108, 8);


INSERT into GUESTS values (1, 'Salman','Khan', '9900012345', '112, mumbai', 'sallubhai@gmail.com', 'visa', 'voter id card');

INSERT into GUESTS values (2, 'Mithali', 'Raj', '9900054321', '201, bangalore', 'mithaliraj@gmail.com', 'rupay', 'pan card');

INSERT into GUESTS values (3, 'Smrithi', 'Mandhana', '9945724378', '420, pune', 'mandhana@gmail.com', 'maestro', 'aadhar card');

INSERT into GUESTS values (4, 'MS', 'Dhoni', '8892736433', '007, jharkhand', 'Helicopter_six@gmail.com', 'maestro', 'aadhar card');

INSERT into GUESTS values (5, 'Gautham', 'Gambhir', '9743296116', '70, Delhi', 'gauthi07@gmail.com', 'rupay', 'pan card');

INSERT into GUESTS values (6, 'Rohit', 'Sharma', '9900011111', '264, Hyderabad', 'doublecentury@gmail.com', 'visa', 'voter id card');

INSERT into GUESTS values (7, 'Virat', 'Kholi', '9000000143', '100, Delhi north', 'viratkohli@yahoo.com', 'visa', 'aadhar card');

INSERT into GUESTS values (8, 'Sachin', 'Tendulkar', '9988776655', '10, Kerala', 'godofcricket@gmail.com', 'rupay', 'aadhar card');


INSERT into BOOKINGS values(100,'2021-01-10',3,'2021-01-14','2021-01-17','Card',1,1,10000.00);

INSERT into BOOKINGS values(101,'2021-01-25',8,'2021-02-02','2021-02-10','Cash',2,2,15000.00);

INSERT into BOOKINGS values(102,'2021-03-10',2,'2021-03-22','2021-03-24','paytm',3,3,9000.00);

INSERT into BOOKINGS values(103,'2021-04-12',11,'2021-04-18','2021-04-29','Card',4,4,22500.00);

INSERT into BOOKINGS values(104,'2021-05-18',5,'2021-05-20','2021-05-25','Cash',5,5,17500.00);
```

```
INSERT into BOOKINGS values(105,'2021-06-12',3,'2021-06-11','2021-06-14','Cash',6,6,12700.00);

INSERT into BOOKINGS values(106,'2021-06-30',9,'2021-07-05','2021-07-14','paytm',7,7,9900.00);

INSERT into BOOKINGS values(107,'2021-07-27',1,'2021-08-19','2021-08-20','Card',8,8,2400.00);


INSERT into ROOMS_BOOKED values (1, 100, 1);

INSERT into ROOMS_BOOKED values (2, 101, 2);

INSERT into ROOMS_BOOKED values (3, 102, 3);

INSERT into ROOMS_BOOKED values (4, 103, 4);

INSERT into ROOMS_BOOKED values (5, 104, 5);

INSERT into ROOMS_BOOKED values (6, 105, 6);

INSERT into ROOMS_BOOKED values (7, 106, 7);

INSERT into ROOMS_BOOKED values (8, 107, 8);


INSERT into BILL values(1,2400.00,'2021-08-20','Sachin','Tendulkar');

INSERT into BILL values(2,9900.00,'2021-07-14','Virat','Kohli');

INSERT into BILL values(3,12700.00,'2021-06-14','Rohit','Sharma');

INSERT into BILL values(4,17500.00,'2021-05-25','Gautham','Gambhir');

INSERT into BILL values(5,22500.00,'2021-04-29','MS','Dhoni');

INSERT into BILL values(6,9000.00,'2021-03-24','Smrithi','Mandhana');

INSERT into BILL values(7,15000.00,'2021-02-10','Mithali','Raj');

INSERT into BILL values(8,10000.00,'2021-01-17','Salman','Khan');


INSERT into ORDERS values(1,'Tomato','soup',150,2);
```

```
INSERT into ORDERS values(2,'Chilli','Chicken',250,1);
INSERT into ORDERS values(3,'Mutton','Biryani',300,1);
INSERT into ORDERS values(4,'Roti','Curry',100,3);
INSERT into ORDERS values(5,'Vegetable','salad',75,2);
INSERT into ORDERS values(6,'Tandoori','Chicken',350,2);
INSERT into ORDERS values(7,'Fish','Fry',280,3);
INSERT into ORDERS values(8,'Curd','Rice',125,1);
```

Outputs -:

List of tables -:

```
hotel_management=# \d
            List of relations
 Schema |     Name      | Type  |  Owner
--------+---------------+-------+----------
 public | bill          | table | postgres
 public | bookings      | table | postgres
 public | department    | table | postgres
 public | employee      | table | postgres
 public | guests        | table | postgres
 public | orders        | table | postgres
 public | room_type     | table | postgres
 public | rooms         | table | postgres
 public | rooms_booked  | table | postgres
 public | tables        | table | postgres
(10 rows)
```

Employee table contents -:

```
hotel_management=# select* from employee;
 emp_id |  efname  | elname  |   ephno    |          eaddr           |          eemail          | salary | super_ssn | dno
--------+----------+---------+------------+--------------------------+--------------------------+--------+-----------+-----
      1 | James    | Borg    | 888665555  | 450 Stone, Houston,TX    | james.borg@gmail.com     |  55000 |           |   1
      2 | John     | Smith   | 998665545  | 731 Fondren,Houston,TX   | john.smith@gmail.com     |  35000 |         1 |   3
      8 | Ahmed    | Jabber  | 7786652533 | 980 Dallas, Houston,TX   | ahmed.jabber@gmail.com   |  35000 |           |   3
      3 | Franklin | Wong    | 778665533  | 638 voss,Houston,TX      | franklin.wong@gmail.com  |  30000 |         8 |   3
      4 | Alicia   | Zelaya  | 988455255  | 3321 Castle,Spring,TX    | alica.zelaya@yaahoo.com  |  65000 |           |   2
      5 | Jennifer | Wallace | 9867585821 | 291 Berry, Bellaire,TX   | jennifer@gmail.com       |  45000 |         2 |   2
      6 | Ramesh   | Narayan | 8884455920 | 975 Fire Oak, Humble, TX | ramesh.narayan@gmail.com |  60000 |         1 |   1
      7 | Jonny    | English | 998665533  | 5631 Rice,Houston,TX     | johnny.english@gmail.com |  60000 |         1 |   1
(8 rows)
```

Department table contents -:

```
hotel_management=# select* from department;
        dname          | dnumber | mgr_ssn
-----------------------+---------+---------
 Housekeeping          |       1 |       1
 Cooking               |       2 |       4
 Accounts              |       3 |       8
 Reception             |       4 |      12
 Security              |       5 |      16
 Electrical Maintenance |       6 |      20
 First Aid             |       7 |      24
 Emergency             |       8 |      28
(8 rows)
```

Bookings table contents -:

```
hotel_management=# select* from bookings;
 booking_id | booking_date | dur_of_stay |  checkin   |  checkout  | pay_type | gid | eid | total_amt
------------+--------------+-------------+------------+------------+----------+-----+-----+-----------
        100 | 2021-01-10   |           3 | 2021-01-14 | 2021-01-17 | Card     |   1 |   1 |     10000
        101 | 2021-01-25   |           8 | 2021-02-02 | 2021-02-10 | Cash     |   2 |   2 |     15000
        102 | 2021-03-10   |           2 | 2021-03-22 | 2021-03-24 | paytm    |   3 |   3 |      9000
        103 | 2021-04-12   |          11 | 2021-04-18 | 2021-04-29 | Card     |   4 |   4 |     22500
        104 | 2021-05-18   |           5 | 2021-05-20 | 2021-05-25 | Cash     |   5 |   5 |     17500
        105 | 2021-06-12   |           3 | 2021-06-11 | 2021-06-14 | Cash     |   6 |   6 |     12700
        106 | 2021-06-30   |           9 | 2021-07-05 | 2021-07-14 | paytm    |   7 |   7 |      9900
        107 | 2021-07-27   |           1 | 2021-08-19 | 2021-08-20 | Card     |   8 |   8 |      2400
(8 rows)
```

Guests table contents -:

```
hotel_management=# select* from guests;
 guest_id | gfname  |  glname   |   gphno    |      gaddr      |          gemail           | credit_info |   id_proof
----------+---------+-----------+------------+-----------------+---------------------------+-------------+---------------
        1 | Salman  | Khan      | 9900012345 | 112,mumbai      | sallubhai@gmail.com       | visa        | voter id card
        2 | Mithali | Raj       | 9900054321 | 201,bangalore   | mithaliraj@gmail.com      | rupay       | pan card
        3 | Smrithi | Mandhana  | 9945724378 | 420,pune        | mandhana@gmail.com        | maestro     | aadhar card
        4 | MS      | Dhoni     | 8892736433 | 007,jharkhand   | Helicopter_six@gmail.com  | maestro     | aadhar card
        5 | Gautham | Gambhir   | 9743296116 | 70,Delhi        | gauthi07@gmail.com        | rupay       | pan card
        6 | Rohit   | Sharma    | 9900011111 | 264,Hyderabad   | doublecentury@gmail.com   | visa        | voter id card
        7 | Virat   | Kholi     | 9000000143 | 100,Delhi north | viratkohli@yahoo.com      | visa        | aadhar card
        8 | Sachin  | Tendulkar | 9988776655 | 10,Kerala       | godofcricket@gmail.com    | rupay       | aadhar card
(8 rows)
```

Rooms table contents -:

```
hotel_management=# select* from rooms;
 room_id | room_no |  type
---------+---------+--------
       1 |     101 | Single
       2 |     102 | Double
       3 |     103 | Double
       4 |     104 | Single
       5 |     201 | Single
       6 |     201 | Double
       7 |     203 | Triple
       8 |     301 | Double
       9 |     302 | Queen
      10 |     303 | Triple
      11 |     304 | Single
      12 |     305 | Double
(12 rows)
```

Room_type table contents -:

```
hotel_management=# select* from room_type;
    room_name    | type_id |  cost   |                                  description                                  | pet_friendly
-----------------+---------+---------+-------------------------------------------------------------------------------+--------------
 Single          |      21 |    1200 | A room assigned to one person.                                                |            0
 Double          |      22 |  2000.5 | A room assigned to two people                                                 |            0
 Triple          |      23 | 3500.25 | A room that can accommodate three persons                                     |            1
 Queen           |      24 |    5000 | A room with a queen-sized bed. May be occupied by one or more people.        |            1
 Single+Balcony  |      25 |    1500 | A room assigned to one person with a balcony                                  |            0
 Single+lakeview |      26 |    1800 | A room assigned to one person with a beautiful view of the lake               |            1
 Double+Balcony  |      27 |    2300 | A room assigned to two people with a balcony                                  |            0
 Double+lakeview |      28 |    2800 | A room assigned to two people with a beautiful view of the lake               |            1
(8 rows)
```

Rooms_booked table contents -:

```
hotel_management=# select* from rooms_booked;
 booked_id | bookings_booking_id | rooms_room_id
-----------+---------------------+---------------
         1 |                 100 |             1
         2 |                 101 |             2
         3 |                 102 |             3
         4 |                 103 |             4
         5 |                 104 |             5
         6 |                 105 |             6
         7 |                 106 |             7
         8 |                 107 |             8
(8 rows)
```

Orders table contents -:

```
hotel_management=# select* from orders;
 order_id | order_fname | order_lname | price | capacity
----------+-------------+-------------+-------+----------
        1 | Tomato      | soup        |   150 |        2
        2 | Chilli      | Chicken     |   250 |        1
        3 | Mutton      | Biryani     |   300 |        1
        4 | Roti        | Curry       |   100 |        3
        5 | Vegetable   | salad       |    75 |        2
        6 | Tandoori    | Chicken     |   350 |        2
        7 | Fish        | Fry         |   280 |        3
        8 | Curd        | Rice        |   125 |        1
(8 rows)
```

Tables table contents -:

```
hotel_management=# select* from tables;
 table_id | capacity
----------+----------
      101 |        2
      102 |        2
      103 |        2
      104 |        4
      105 |        4
      106 |        6
      107 |        6
      108 |        8
(8 rows)
```

Bill table contents -:

```
hotel_management=# select* from bill;
 bill_id | total_amt | created_at | bill_fname | bill_lname |   city    |   state   | country
---------+-----------+------------+------------+------------+-----------+-----------+---------
       1 |      2400 | 2021-08-20 | Sachin     | Tendulkar  | Bangalore | Karnataka | India
       2 |      9900 | 2021-07-14 | Virat      | Kohli      | Bangalore | Karnataka | India
       3 |     12700 | 2021-06-14 | Rohit      | Sharma     | Bangalore | Karnataka | India
       4 |     17500 | 2021-05-25 | Gautham    | Gambhir    | Bangalore | Karnataka | India
       5 |     22500 | 2021-04-29 | MS         | Dhoni      | Bangalore | Karnataka | India
       6 |      9000 | 2021-03-24 | Smrithi    | Mandhana   | Bangalore | Karnataka | India
       7 |     15000 | 2021-02-10 | Mithali    | Raj        | Bangalore | Karnataka | India
       8 |     10000 | 2021-01-17 | Salman     | Khan       | Bangalore | Karnataka | India
(8 rows)
```

Contributions -:

1) B. Pravena – PES2UG19CS076 – create statements, relational schema, report compilation (3.5hrs)
2) Bharath Kumar S P-PES2UG19CS087 – first half of insert statements (3hrs)
3) Bhuvantej R – PES2UG19CS092 –second half of insert statements (3hrs)