Information filled by student:

Course basic information

Code	Course Name	Credit Hours		
		Lecture	Practice	Total
IS212	قواعد البيانات	2	2	3

Research Title

(Hotel Reservation System)

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Level: 2nd Level
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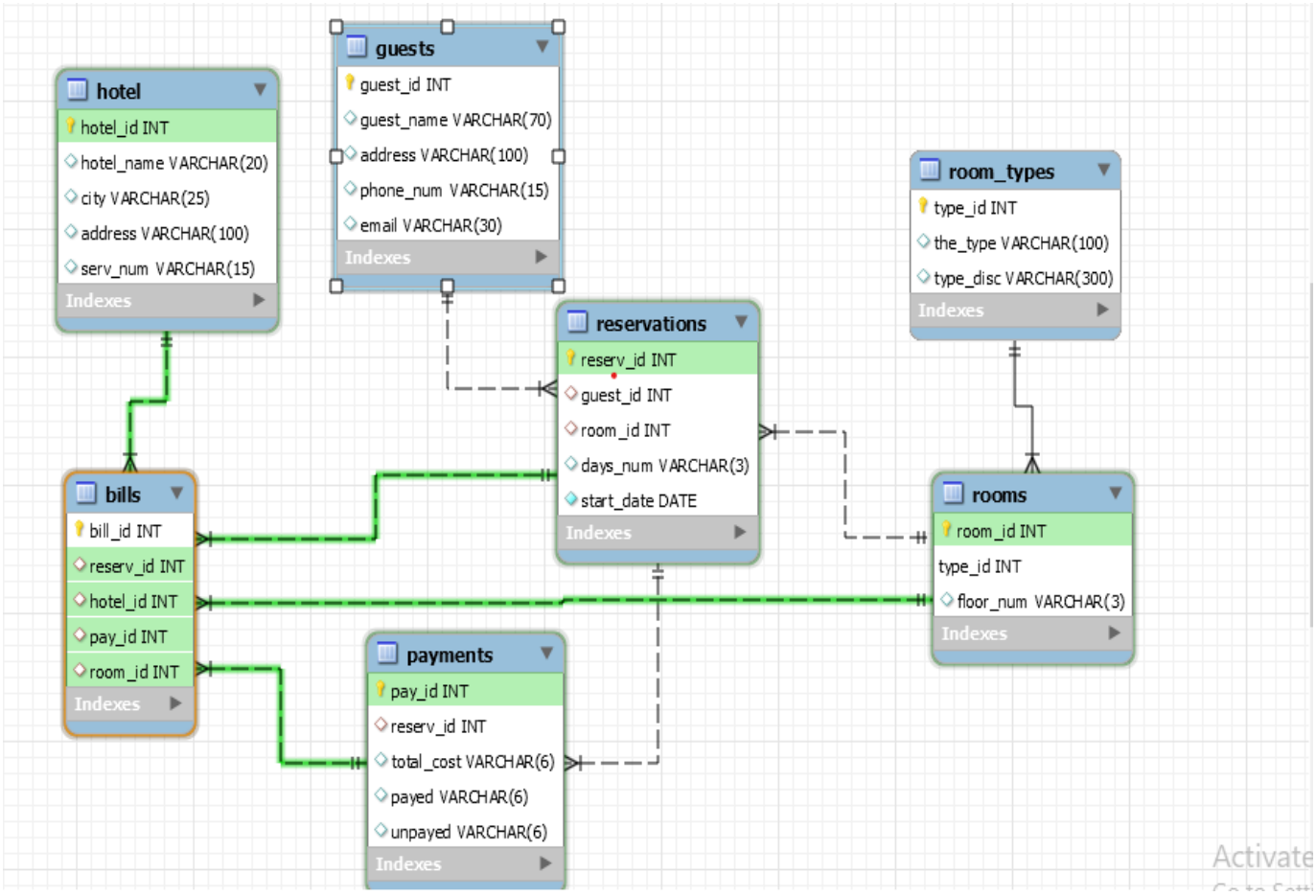
System Description

Hotel Reservation System is a system used to making reservation for a hotel. The system has many functions to do, and has some stored information about the hotel such as: the hotel name, its location, the number of the services, and some information about its rooms as the types and the description. The functions that the system do is storing the information of the guest, showing the available rooms after that the guest choose the room, doing the reservation, doing calculating for the cost according to the number of the days he or she will stay, and the type of the room, and in the end print a bill to the guest with all required information. In the reservation the employee looks at first if the guest registered before or not if he or she registered then uses his or her previous information, or

not then the employee registers all needed information such as the name, address, the phone number, and the email. Then the employee registers the required information for the reservation such as the type of the required room and its number, the number of days that the guest will stay, and the start date of the stay. Then follows this information to the payment department and calculates the total cost of the stay. Then print a bill for the guest with this information.

Entity Relationship Diagram



Data Dictionaries

1. Hotel Table:

   Hotel table has 5 of columns. The following table illustrates these columns with details:

Fields	Description	Data Type
Hotel_id	Is an unique id for the hotel	Int auto_increment
City	The city where the hotel be	Varchar
Address	The address of the hotel	Varchar
Hotel_name	The name of the hotel	Varchar
Serv_num	The services number of the hotel	Varchar

2. Guests table:

   Guests table also has 5 columns (fields). The following table illustrates these 5 fields:

Fields	Description	Data Type
guest_id	A unique id for each guest	Int auto_increment
guest_name	The name of the guest	Varchar
address	The address of the guest where the guest life	Varchar
phone_num	The field that hold the phone number of the guest	Varchar
email	To store the email of the guest	Varchar

3. Room_types Table:

   This table has 3 fields as shown in the next table:

Fields	Description	Data Type
type_id	The unique id for each type from the types of rooms in the hotel	Int auto_increment
the_type	The type of the room	Varchar
type_disc	To describe the details of the room	Varchar

4. Rooms Table:

   This table has also 3 fields as they shown in the next table:

Fields	Description	Data Type
room_id	The id or the number of the room	Int auto_increment
type_id	The id of the type of the room	Int
floor_num	The number of the floor where the room be	Int

5. Reservation Table: the following table illustrates its fields and data types

Fields	Description	Data Type
reserv_id	The unique id for each reservation	Int auto_increment
guest_id	The id of the guest who want to make reservation	Int
room_id	The id of the reserved room	Int
days_num	The number of days that the guest will stay	Int
start_date	The start date of the stay	Date

6. Payments Table: the following table illustrates its fields description:

Fields	Description	Data Type
pay_id	The id of the payment calculation	Int Auto_increment
reserv_id	The id of the reservation	Int
total_cost	The total cost of the stay	Int
payed	The paid part of the total cost	Int
unpayed	The unpaid part of the total cost	Int

7. Bills Table: the following table illustrates this table with its details:

Fields	Description	Data Type
bill_id	The id of the bill that the guest will be receive	Int Auto_increment
reserv_id	The id of the reservation	Int
hotel_id	The id of the hotel	Int

pay_id	The id of the payment	Int
room_id	The id of the room	Int

Select Statements using Different Functions

1. Find the maximum cost in the payments table.
   Select max(total_cost) from payments;
2. Find the minimum cost from payments table.
   Select min(total_cost) from payments;
3. Find the average cost in the payments table.
   Select avg(total_cost)from payments;
4. Find the count of records in payments table.
   Select count(pay_id)from payments;
5. Find the sum of the cost in the payments table.
   Select sum(total_cost)from payments;
6. Select all when the cost is maximum from payments table.
   Select * from payments
   Where total_cost = (select max(total_cost) from payments);
7. Select all records in the reservation table.
   Select * from reservations;
8. Find the maximum number of days in the reservation table.
   Select max(days_num) from reservations;
9. Find the minimum number of days in the reservation table.
   Select min(days_num) from reservations;
10. Find the sum of the reserved days in the reservation table.
    select sum(days_num) from reservations;
11. Find the average value of the days in the reservations table.
    select avg(days_num) from reservations;
12. Find the reservations where the number of days is max.

select * from reservations

where days_num = (select max(days_num) from reservations);

13. Find all information that related to the guest who will stay minimum in the hotel.

    select * from guests

    where guest_id = (select guest_id from reservations

    where days_num = (select min(days_num) from reservations));

14. Find the id and the floor number of the room that will be reserved for minimum days from rooms table.

    select room_id, floor_num from rooms

    where room_id = (select room_id from reservations

    where days_num = (select min(days_num) from reservations));

15. Find the maximum number of floors from rooms table.

    select max(floor_num) from rooms;

16. Find the number of rooms in the hotel.

    select max(room_id) from rooms;

17. Return all types and its description of rooms from room_types table.

    Select the_type, type_disc from room_types;

18. Find the id of the bills that have minimum cost.

    select bill_id from bills

    where pay_id = (select pay_id from payments

    where total_cost = (select min(total_cost)from payments));

19. Find the id of the bills that have maximum cost.

    select bill_id from bills

    where pay_id = (select pay_id from payments

    where total_cost = (select max(total_cost)from payments));

20. Return the hotel name ant its services phone number from hotel table.

    Select hotel_name, serv_num from hotel;

Select Statements using Sub Query

1. Find the guest name and phone number for all reservations in 2020. March from guests table.

   select guest_name, phone_num from guests

where guest_id in (select guest_id from reservations
where start_date >= '2020-03-01');

2. Select the guest name and the email for all reservations that have maximum stay from guests table.

   select guest_name, email from guests
   where guest_id in (select guest_id from reservations
   where days_num = (select max(days_num) from reservations));

3. Find all details of the payment of the reservations that have maximum stay from payments table.

   select * from payments
   where reserv_id in (select reserv_id from reservations
   where days_num = (select max(days_num) from reservations));

Select Statements using Count and Group Functions

1. Find the number of rooms that its type id is 7 from rooms table.

   select count(room_id) from rooms
   where type_id = 7;

2. Find the count of the room according to each type from rooms table.

   select count(room_id) from rooms
   group by type_id;

3. Find the the count of the reserved rooms according to the type_id and the type_id from rooms table.

   select count(type_id), type_id, room_id from rooms
   where room_id in (select room_id from reservations)
   group by type_id;

Select Statement using Different Joins

1. Return the records of the payments table by replacing the reserve_id by the days_num column.

   ```
   select pay_id, days_num, total_cost, payed, unpayed
   from payments
   inner join reservations
   on payments.reserv_id = reservations.reserv_id;
   ```

2. Return the reservations id ,guest_name, and the start_date from the reservations table.

   ```
   select reserv_id, guest_name, start_datefrom reservations
   inner join guests
   on reservations.guest_id = guests.guest_id;
   ```

3. Return the room id, floor_number, and the type of the rooms from rooms table.

   ```
   select room_id, floor_num, the_typefrom rooms
   inner join room_types
   on rooms.type_id = room_types.type_id;
   ```

4. Return the count of the rooms according to the type, type, and the description of the room from rooms table.

   ```
   select count(room_id), the_type, type_disc
   from rooms
   left join room_types
   on rooms.type_id = room_types.type_id
   group by the_type;
   ```

5. Return the count of the reserved rooms according to each type, the floor_number, the types of this rooms, and the description of this types.

   ```
   select count(the_type), floor_num, the_type, type_disc
   from rooms
   right join room_types
   on rooms.type_id = room_types.type_id
   where room_id in (select room_id from reservations)
   group by the_type;
   ```

Insert Statements

1. insert into guests (guest_name, address, phone_num, email)
   values ('Omar Ahmed Saad', 'Alix', '01067950341', 'omar_omar1220@yahoo.com');
2. insert into room_types (the_type, type_disc)
   values ('Executive', 'They are called the room or suite on the upper floors, and they have a place dedicated to breakfast with other features, such as free internet hours in the business center, and usually a room and a hall');
3. insert into rooms (type_id, floor_num)
   values (8,5);
4. insert into reservations (guest_id, room_id, days_num, start_date)
   values (14,34,15,'2020-03-06');
5. insert into payments (reserv_id, total_cost, payed, unpayed)
   values (15,3750,3000,750);
6. insert into bills (reserv_id, hotel_id, pay_id, room_id)
   values (15,1,14,34);

Update Statement

1. update guests
   set phone_num = '01098365002' where guest_id = 3;
2. update guests
   set phone_num = '01005365032' where guest_id = 5;
3. update rooms
   set type_id = 5 where room_id = 10;
4. update rooms
   set type_id = 8 where room_id = 29;
5. update payments
   set payed = 7500, unpayed = null where pay_id = 6;
6. update payments

set payed = 3750, unpayed = null where pay_id = 14;

Delete Statements

1. delete from rooms where room_id = 2;
2. delete from rooms where room_id = 5;
3. delete from rooms where room_id = 18;
4. delete from payments where reserv_id = 1;
5. delete from bills where bill_id = 1;
6. delete from bills where bill_id = 4;

References

- **https://www.w3schools.com/sql/.**
- **https://www.tutorialspoint.com/sql/sql-useful-functions.htm.**

References