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CSCI362: Databases and Datamining

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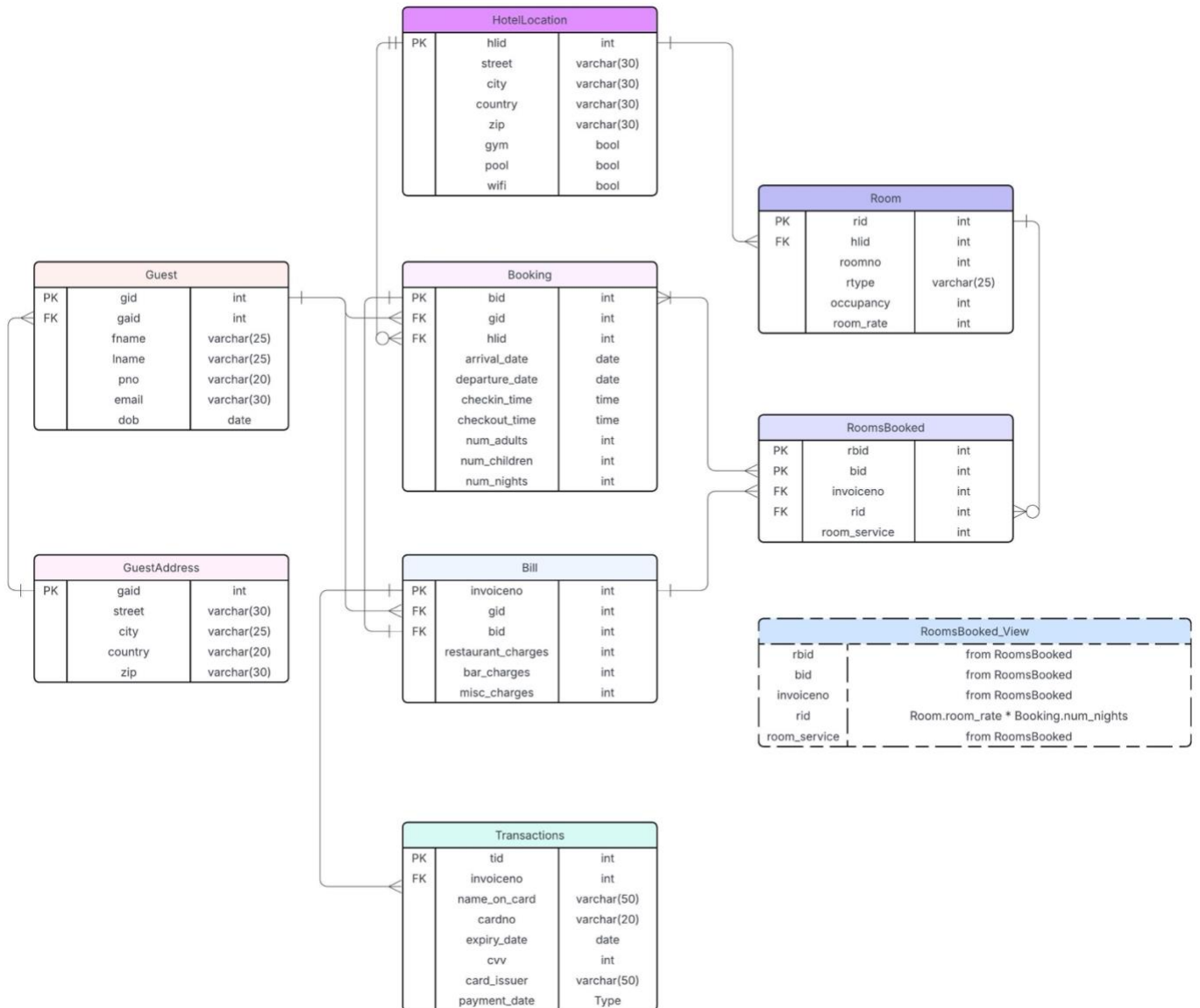
Milton Hotels Database Management System (DBMS)

Question 1: Assumptions

1. Multiple guests can have the same address.
2. Only one guest will check-in for his or her entire party. Only the person booking the hotel will have his or her information saved.
3. Each booking is limited to one hotel location.
4. Guests can book numerous rooms.
5. A room cannot be double booked.
   - ER Diagram Explained: The same room can be booked for different dates, with **rooms** to **roomsbooked** having a one to zero or many relationship. Therefore, **roomsbooked** can have multiple **bookings**, with a many to many relationship.
   - Given the relationship between **roomsbooked** and **bookings**, how will double booking be prevented?
     > The constraint will not be built into the database; rather, it will be enforced in the source code. We will check for room availability before inserting new values.
6. The payment method is card only.
7. Multiple cards can pay for the bill.
8. The bill will be sent out as one cumulative statement at the end of the stay, with all booked rooms charged to one bill.
   - ER Diagram Explained: While a **guest** can only have one **bill** per booking, implying a one-to-one relationship, the guest can have multiple bookings and will be billed for each of them, creating a one-to-many relationship.

Question 2: ER Diagram / Relational Diagram

HotelLocation

PK	hlid	int
	street	varchar(30)
	city	varchar(30)
	country	varchar(30)
	zip	varchar(30)
	gym	bool
	pool	bool
	wifi	bool

Room

PK	rid	int
FK	hlid	int
	roomno	int
	rtype	varchar(25)
	occupancy	int
	room_rate	int

Guest

PK	gid	int
FK	gaid	int
	fname	varchar(25)
	lname	varchar(25)
	pno	varchar(20)
	email	varchar(30)
	dob	date

Booking

PK	bid	int
FK	gid	int
FK	hlid	int
	arrival_date	date
	departure_date	date
	checkin_time	time
	checkout_time	time
	num_adults	int
	num_children	int
	num_nights	int

RoomsBooked

PK	rbid	int
PK	bid	int
FK	invoiceno	int
FK	rid	int
	room_service	int

GuestAddress

PK	gaid	int
	street	varchar(30)
	city	varchar(25)
	country	varchar(20)
	zip	varchar(30)

Bill

PK	invoiceno	int
FK	gid	int
FK	bid	int
	restaurant_charges	int
	bar_charges	int
	misc_charges	int

RoomsBooked_View

rbid	from RoomsBooked
bid	from RoomsBooked
invoiceno	from RoomsBooked
rid	Room.room_rate * Booking.num_nights
room_service	from RoomsBooked

Transactions

PK	tid	int
FK	invoiceno	int
	name_on_card	varchar(50)
	cardno	varchar(20)
	expiry_date	date
	cvv	int
	card_issuer	varchar(50)
	payment_date	Type

Question 3:

Table: GuestAddress

```sql
12    create table MiltonHotels.GuestAddress
13    ( gaid int,
14      street varchar(30) not null,
15      city varchar(25) not null,
16      country varchar(20) not null,
17      zip varchar(30),
18      primary key (gaid));
```

Table: Guest

```sql
20    create table MiltonHotels.Guest
21    ( gid int,
22      gaid int,
23      fname varchar(25) not null,
24      lname varchar(25) not null,
25      pno varchar(25) not null,
26      email varchar(30) not null,
27      dob date not null,
28      primary key (gid),
29      unique (email, pno),
30      foreign key (gaid) references MiltonHotels.GuestAddress(gaid));
```

Table: HotelLocation

```sql
32    create table MiltonHotels.HotelLocation
33    ( hlid int,
34      street varchar(30) not null,
35      city varchar(30) not null,
36      country varchar(30) not null,
37      zip varchar(30),
38      gym bool,
39      pool bool,
40      wifi bool,
41      primary key (hlid));
```

Table: Booking

```sql
43  create table MiltonHotels.Booking
44  ( bid int,
45    gid int,
46    hlid int,
47    arrival_date date not null,
48    departure_date date not null,
49    checkin_time time,
50    checkout_time time,
51    num_adults int not null check (num_adults >= 1),
52    num_children int,
53    num_nights int generated always as (datediff(departure_date, arrival_date)) stored,
54    primary key (bid),
55    foreign key (gid) references MiltonHotels.Guest(gid),
56    foreign key (hlid) references MiltonHotels.HotelLocation(hlid));
```

Table: Bill

```sql
58  create table MiltonHotels.Bill
59  ( invoiceno int,
60    gid int,
61    bid int,
62    restaurant_charges int default 0.00,
63    bar_charges int default 0.00,
64    misc_charges int default 0.00,
65    primary key (invoiceno),
66    foreign key (gid) references MiltonHotels.Guest(gid),
67    foreign key (bid) references MiltonHotels.Booking(bid));
```

Table: Room

```sql
81  create table MiltonHotels.Room
82  ( rid int,
83    hlid int,
84    roomno int not null,
85    rtype varchar(25) not null,
86    occupany int not null,
87    room_rate int,
88    primary key (rid),
89    foreign key (hlid) references MiltonHotels.HotelLocation(hlid));
```

Table: RoomsBooked

```
 91 •    create table MiltonHotels.RoomsBooked
 92 ⊖ ( rbid int,
 93      bid int,
 94      invoiceno int,
 95      rid int,
 96      total_room_charge int default 0.00,
 97      room_service int default 0.00,
 98      primary key (rbid),
 99      foreign key (bid) references MiltonHotels.Booking(bid),
100      foreign key (invoiceno) references MiltonHotels.Bill(invoiceno),
101      foreign key (rid) references MiltonHotels.Room(rid));
```

Table: Transactions

```
 69 •    create table MiltonHotels.Transactions
 70 ⊖ ( tid int,
 71      invoiceno int,
 72      name_on_card varchar(50) not null,
 73      cardno varchar(20) not null,
 74      expiry_date date not null,
 75      cvv int not null,
 76      card_issuer varchar(50),
 77      payment_date date,
 78      primary key (tid),
 79      foreign key (invoiceno) references MiltonHotels.Bill(invoiceno));
```

View

```
103 •    create view RoomsBooked_View as
104      select rb.rbid, rb.bid, rb.invoiceno, rb.rid, r.room_rate * b.num_nights as total_room_charge, rb.room_service
105      from MiltonHotels.RoomsBooked rb
106      join MiltonHotels.Room r on rb.rid = r.rid
107      join MiltonHotels.Booking b on rb.bid = b.bid
```

Question 4: INSERT

Table: GuestAddress

```
17 ●    insert into MiltonHotels.GuestAddress values
18      (1, '321 Maple Dr', 'Paris', 'France', '70123'),
19      (2, '987 Cedar Blvd', 'New York', 'USA', '10019'),
20      (3, '111 Rose Ave', 'Port Nelson', 'Bahamas', null);
```

Table: Guest

```
22 ●    insert into MiltonHotels.Guest (gid, gaid, fname, lname, pno, email, dob) values
23      (1, 1, 'Celine', 'Laurent', '+33 6 12 34 56 78', 'cellylaurent@example.com', '2004-04-26'),
24      (2, 2, 'Charlie', 'Brown', '(347)000-111', 'cbrownie@example.com', '1950-07-30'),
25      (3, 3, 'Jane', 'Doe', '+1 (242) 355-1234', 'jane@example.com', '2001-01-01');
```

Table: HotelLocation

```
3 ●    insert into MiltonHotels.HotelLocation (hlid, street, city, country, zip, gym, pool, wifi) values
4      (1, '123 Main St', 'New York', 'USA', 10002, true, true, true),
5      (2, '654 Oak Ave', 'Los Angeles', 'USA', '90001', false, true, true),
6      (3, '987 Pine Ln', 'San Diego', 'USA', '91911', true, false, true),
7      (4, '101 Elm Rd', 'Houston', 'USA', '77001', false, false, false);
```

Table: Booking

```
27      -- Booking 1: Celine Laurent, NY Location, 2 rooms, 5 nights
28 ● ⊖ insert into MiltonHotels.Booking (bid, gid, hlid, arrival_date,
29      departure_date, checkin_time, checkout_time, num_adults, num_children) values
30      (1, 1, 1, '2024-07-10', '2024-07-15', '15:00:00', '11:00:00', 2, 1);
31
32      -- Booking 2: Charlie Brown, Houston Location, 1 room, 3 nights
33 ● ⊖ insert into MiltonHotels.Booking (bid, gid, hlid, arrival_date,
34      departure_date, checkin_time, checkout_time, num_adults, num_children) values
35      (2, 2, 4, '2025-02-01', '2025-02-04', '15:00:00', '11:00:00', 1, 0);
36
37      -- Booking 3: Jane Doe, 1 room, San Diego Location, 1 room, 2 nights
38 ● ⊖ insert into MiltonHotels.Booking (bid, gid, hlid, arrival_date,
39      departure_date, checkin_time, checkout_time, num_adults, num_children) values
40      (3, 3, 3, '2026-09-05', '2026-09-07', '15:00:00', '11:00:00', 2, 3);
```

Table: Bill

```sql
42 •   insert into MiltonHotels.Bill (invoiceno, gid, bid, restaurant_charges, bar_charges, misc_charges) values
43       (1, 1, 1, 300.28, 163.17, 25.00), -- Bill for Booking 1
44       (2, 2, 2, 50.83, 72.60, default), -- Bill for Booking 2
45       (3, 3, 3,  default, default, default); -- Bill for Booking 3
```

Table: Room

```sql
9 •    insert into MiltonHotels.Room (rid, hlid, roomno, rtype, occupany, room_rate) values
10       (101, 1, 550, 'Standard', 2, 150.00),
11       (102, 1, 820, 'Standard', 2, 150.00),
12       (201, 2, 790, 'Deluxe', 3, 250.00),
13       (301, 3, 550, 'Ocean View', 4, 375.00),
14       (401, 4, 910, 'Presidential Suite', 5, 500.00),
15       (402, 4, 330, 'Standard', 2, 200.00);
```

Table: RoomsBooked

```sql
47 •   insert into MiltonHotels.RoomsBooked (rbid, bid, invoiceno, rid, room_service) values
48       (1, 1, 1, 101, 30),
49       (2, 1, 1, 102, 30),
50       (3, 2, 2, 401, 100),
51       (4, 3, 3, 301, default);
```

Table: Transactions

```sql
53 •   insert into MiltonHotels.Transactions (tid, invoiceno, name_on_card, cardno, expiry_date, cvv, card_issuer, payment_date) values
54       (1, 1, 'Celine Laurent', '4242 2222 3333 4444' , '2028-12-01', 123, 'Visa', '2024-07-20'), -- Booking 1: Split payment between 2 cards
55       (2, 1, 'David Lee', '5555 6666 7777 8888', '2027-06-01', 456, 'Mastercard', '2024-07-20'),
56       (3, 2, 'Charlie Brown', '3782 822463 10005', '2029-01-01', 789, 'American Express', '2025-02-04'),
57       (4, 3, 'Chris Walsh', '6011 1111 1111 1117', '2026-09-01', 101, 'Discover', null);
```

Question 4: UPDATE

Table: GuestAddress

```
 7 •    update MiltonHotels.GuestAddress
 8      set
 9      street = '222 New Address Rd',
10      city = 'Vik',
11      country = 'Iceland',
12      zip = 870
13      where gaid = 3;
```

Table: Guest

```
16 •    update  MiltonHotels.Guest
17      set
18      fname = 'Guinevere',
19      lname = 'Beck',
20      pno = '+354 487 1345'
21      where gid = 3;
```

Table: HotelLocation

```
73 •    update MiltonHotels.HotelLocation
74      set
75      street = '210 Rosewood Pl',
76      city = 'Miami',
77      zip = 33101,
78      gym = true
79      where hlid = 3;
```

Table: Booking

```
26 •    update MiltonHotels.Booking
27      set
28      arrival_date = '2026-12-20',
29      departure_date = '2027-01-02'
30      where gid = 3 and bid = 3;
```

Table: Bill

```
59 ●    update MiltonHotels.Bill
60      set
61      restaurant_charges = 15.00
62      where invoiceno = 2;
```

Table: Room

```
67 ●    update MiltonHotels.Room
68      set rtype = 'deluxe'
69      where hlid = 1 and rtype = 'standard';
```

Table: RoomsBooked

```
34 ●    update MiltonHotels.RoomsBooked
35      set
36   ⊖  rid =  (
37      select r.rid
38      from MiltonHotels.Room r
39      where rtype = 'Standard' and hlid = 4
40      limit 1
41      )
42      where rbid = 4;
```

Table: Transaction

```
46 ●    update MiltonHotels.Transactions
47      set
48      name_on_card = 'Guinevere Beck',
49      cardno = '3782 822463 10005',
50      expiry_date = '2030-12-01',
51      cvv = 1234,
52      card_issuer = 'American Express'
53      where tid = 4;
```

Question 4: DELETE

Table: Room

```
6 •    delete from MiltonHotels.Room
7      where rid = 201;
```

Table: HotelLocation

```
10 •    delete from MiltonHotels.HotelLocation
11      where hlid = 2;
```

Table: RoomsBooked

```
14 •    delete from MiltonHotels.RoomsBooked
15      where rbid = 3;
```

Table: Transactions

```
18 •    delete from MiltonHotels.Transactions
19      where tid = 3;
```

Table: Bill

```
22 •    select * from MiltonHotels.Bill;
23 •    delete from MiltonHotels.Bill
24      where invoiceno = 2;
```

Table: Booking

```
27 •    delete from MiltonHotels.Booking
28      where bid = 2;
```

Table: Guest

```
31 •    delete from MiltonHotels.Guest
32      where gid = 2;
```

Table: GuestAddress

```
35 •    delete from MiltonHotels.GuestAddress
36      where gaid = 2;
```