HOTEL MANAGMENT SYSTEM

Hotel Assignment

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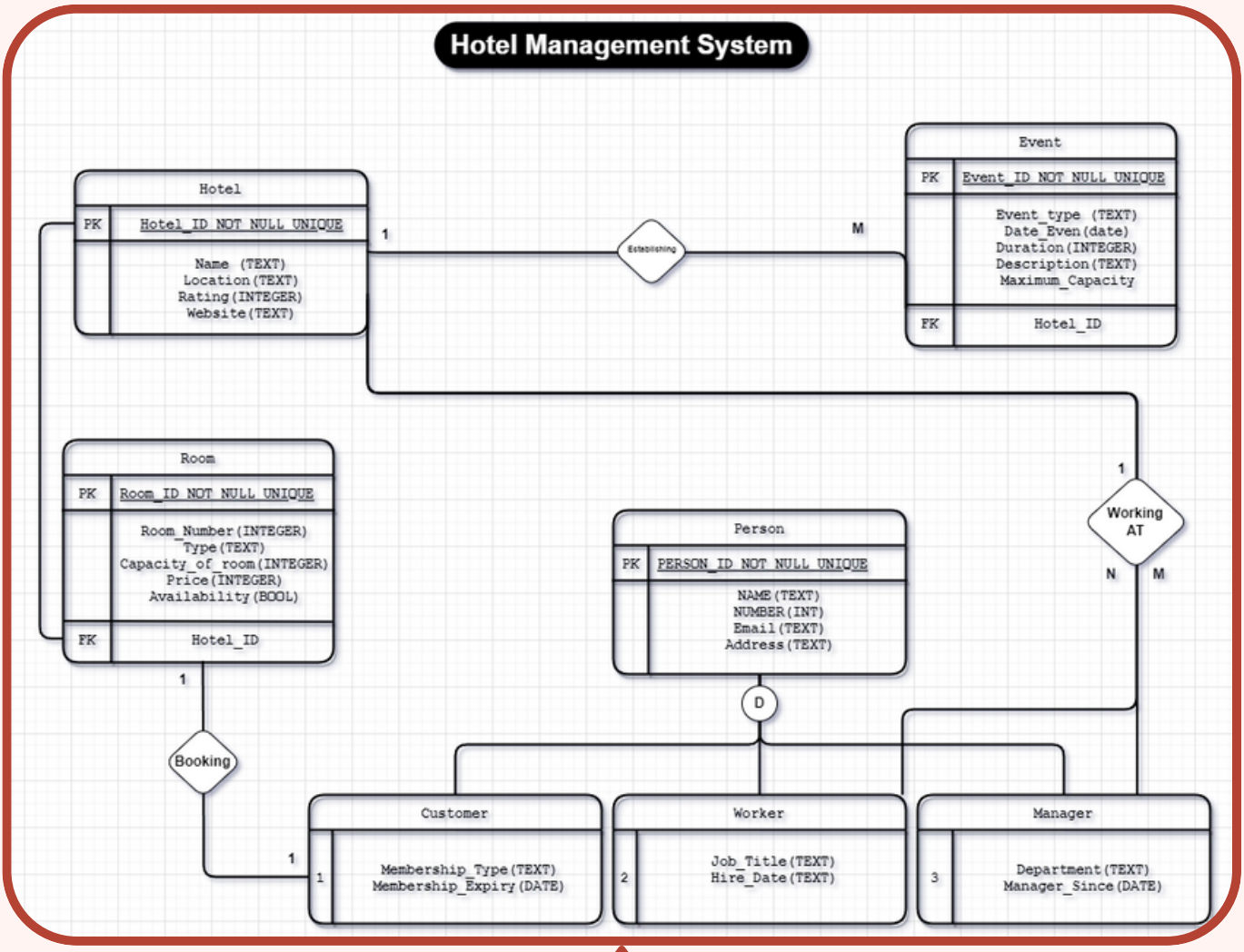
We've established firstly 4 entities and the entity parent of person "As Parent" which focus on 3 Childs

<u>Customer:</u> to save data of our audience

<u>Worker:</u> as janitor or waiter etc.

<u>manager:</u> who's manage specific department



Room

Purpose

Manages details about the rooms available in a hotel.

Attributes

Room_ID (Primary Key): Uniquely identifies each room.

Room_Number: Room number for identification.

Type: Type or category of the room.

Capacity_of_room: Maximum capacity of the room (number of guests it can accommodate).

Price: Cost of the room.

Availability: Indicates whether the room is available or not.

Hotel_ID (Foreign Key): Associates the room with a specific hotel.

Hotel

Purpose

Represents a hotel establishment.

Attributes

Hotel_ID (Primary Key): Uniquely identifies each hotel.

Name: Name of the hotel.

Location: Location where the hotel is situated.

Rating: Rating or quality score of the hotel.

Website: Website address of the hotel.

Person

Purpose

Stores general information about individuals.

Attributes

Person_ID (Primary Key): Uniquely identifies each person.

Name: Name of the individual.

Number: A unique identifier for the person (e.g., personal ID, phone number).

Email: Email address of the person.

Address: Residential or contact address.

Event

Purpose

Stores information about events hosted by a hotel.

Attributes

Event_ID (Primary Key): Uniquely identifies each event.

Event_type: Type or category of the event.

Date_Event: Date on which the event is scheduled.

Duration: Duration or length of the event.

Description: Brief description of the event.

Maximum_Capacity: Maximum number of individuals the event can accommodate.

Hotel_ID (Foreign Key): Links the event to a specific hotel.

Customer

Purpose

Represents individuals who are customers or guests.

Attributes

Person_ID (Primary and Foreign Key): Associates a person with their customer profile.

Membership_Type: Type or level of membership held by the customer.

Membership_Expiry: Date when the membership is due to expire.

Worker

Purpose

Contains details about employees working at the hotel.

Attributes

Person_ID (Primary and Foreign Key): Associates a person with their worker profile.

Job_Title: Job title or role of the worker.

Hire_Date: Date when the worker was hired.

Hotel_ID (Foreign Key): Associates the worker with a specific hotel.

Manager

Purpose

Represents the managerial staff at the hotel.

Attributes:

Person_ID (Primary and Foreign Key): Associates a person with their manager profile.

Department: Department or section managed by the individual.

Manager_Since: Date when the manager began managing the department.

Working At

Purpose

Working as access point for worker and manager for hotel

Attributes:

Person_ID (Primary and Foreign Key): Associates a person with their manager profile or worker.

Hotel ID: Assigned as the Hotel id where worker or manager works for

Logical Schema

the process of transforming (or mapping) a conceptual schema of the application domain into a schema for the data model underlying a particular DBMS

1NF + 2NF + 3NF = ✓

Hotel(Hotel_ID(PK), Name, Location, Rating, Website)

Event(Event_ID(PK), Event_type, Date_Event, Duration, Description, Maximum_Capacity, Hotel_ID(FK))

Room(Room_ID(PK), Room_Number, Type, Capacity_of_room, Price, Availability, Hotel_ID(FK))

Person(Person_ID(PK), Name, Number, Email, Address)

Customer(Person_ID(PK, FK), Membership_Type, Membership_Expiry)
Worker(Person_ID(PK, FK), Job_Title, Hire_Date)
Manager(Person_ID(PK, FK), Department, Manager_Since)

Working_AT(Person_ID(PK,FK), Hotel_ID(FK))

```
CREATE TABLE Hotel ( Hotel_ID INT PRIMARY KEY, Name VARCHAR(255), Location VARCHAR(255), Rating INT, Website VARCHAR(255) );
```

```
CREATE TABLE Event ( Event_ID INT PRIMARY KEY, Event_type VARCHAR(255), Date_Event DATE, Duration INT, Description TEXT, Maximum_Capacity INT, Hotel_ID INT, FOREIGN KEY (Hotel_ID) REFERENCES Hotel(Hotel_ID) );
```

```
CREATE TABLE Room ( Room_ID INT PRIMARY KEY, Room_Number INT, Type VARCHAR(255), Capacity_of_room INT, Price INT, Availability BOOLEAN, Hotel_ID INT, FOREIGN KEY (Hotel_ID) REFERENCES Hotel(Hotel_ID) );
```

```
CREATE TABLE Person ( Person_ID INT PRIMARY KEY, Name VARCHAR(255), Number INT, Email VARCHAR(255), Address TEXT );
```

```
CREATE TABLE Customer ( Person_ID INT PRIMARY KEY, Membership_Type VARCHAR(255), Membership_Expiry DATE, FOREIGN KEY (Person_ID) REFERENCES Person(Person_ID) );
```

```
CREATE TABLE Worker ( Person_ID INT PRIMARY KEY, Job_Title VARCHAR(255), Hire_Date DATE, Hotel_ID INT, FOREIGN KEY (Person_ID) REFERENCES Person(Person_ID), FOREIGN KEY (Hotel_ID) REFERENCES Hotel(Hotel_ID) );
```

```
CREATE TABLE Manager ( Person_ID INT PRIMARY KEY, Department VARCHAR(255), Manager_Since DATE, FOREIGN KEY (Person_ID) REFERENCES Person(Person_ID) );
```

```
CREATE TABLE Working_AT ( Person_ID INT, Hotel_ID INT, PRIMARY KEY (Person_ID, Hotel_ID), FOREIGN KEY (Person_ID) REFERENCES Person(Person_ID), FOREIGN KEY (Hotel_ID) REFERENCES Hotel(Hotel_ID) );
```

Hotel

```
-- Insert random values into Hotel table
INSERT INTO Hotel (Hotel_ID, Name, Location, Rating, Website) VALUES
(501, 'Grand Hotel', 'City Centre', 5, 'http://www.grandhotel.com'),
(502, 'Seaside Resort', 'Beachfront', 4, 'http://www.seasideresort.com'),
(503, 'Mountain Lodge', 'Mountain Retreat', 4, 'http://www.mountainlodge.com'),
(504, 'Urban Oasis', 'Downtown', 3, 'http://www.urbanoasis.com'),
(505, 'Countryside Inn', 'Rural Area', 3, 'http://www.countrysideinn.com');
```

Event

```
-- Insert random values into Event table
INSERT INTO Event (Event_ID, Event_type, Date_Event, Duration, Description,
Maximum_Capacity, Hotel_ID) VALUES
(601, 'Conference', '2023-02-15', 3, 'Annual Business Conference', 200, 501),
(602, 'Wedding', '2023-05-20', 6, 'John and Alice Wedding', 150, 502),
(603, 'Concert', '2023-08-10', 4, 'Summer Music Festival', 300, 503),
(604, 'Meeting', '2023-11-30', 2, 'Board of Directors Meeting', 50, 504),
(605, 'Party', '2023-12-31', 5, 'New Year Celebration', 100, 505);
```

Room

```
-- Insert random values into Room table
INSERT INTO Room (Room_ID, Room_Number, Type, Capacity_of_room, Price,
Availability, Hotel_ID) VALUES
(701, '101', 'Standard', 2, 100, 'Available', 501),
(702, '202', 'Suite', 4, 200, 'Available', 502),
(703, '303', 'Deluxe', 3, 150, 'Available', 503),
(704, '404', 'Standard', 2, 100, 'Available', 504),
(705, '505', 'Suite', 4, 200, 'Available', 505);
```

We have made some good changes, that will lead to easy connections between database and each one in table by knowing person main table and insert each one in table connected to person table using joins

Person Table

```
-- Inserting sample data into the Customer table
-- Insert random values into Person tableINSERT INTO Person (Person_ID, Name, Number, Email, Address) VALUES
-- Customers
(101, 'Alice Johnson', '111111111', 'alice@email.com', '123 Main Street, London'),
(102, 'Bob Smith', '222222222', 'bob@email.com', '456 High Street, Manchester'),
(103, 'Charlie Brown', '333333333', 'charlie@email.com', '789 Seaside Avenue, Brighton'),
(104, 'David White', '444444444', 'david@email.com', '567 Mountain Road, Edinburgh'),
(105, 'Eva Green', '555555555', 'eva@email.com', '678 Riverside Drive, Birmingham'),
-- Workers
(201, 'John Doe', '666666666', 'john@email.com', 'Address 6, City 6'),
(202, 'Jane Smith', '777777777', 'jane@email.com', 'Address 7, City 7'),
(203, 'Michael Johnson', '888888888', 'michael@email.com', 'Address 8, City 8'),
(204, 'Emily White', '999999999', 'emily@email.com', 'Address 9, City 9'),
(205, 'David Brown', '1010101010', 'davidb@email.com', 'Address 10, City 10'),
-- Managers
(301, 'Sarah Johnson', '1111111111', 'sarah@email.com', 'Address 11, City 11'),
(302, 'Ryan Smith', '1212121212', 'ryan@email.com', 'Address 12, City 12'),
(303, 'Emma Brown', '1313131313', 'emma@email.com', 'Address 13, City 13'),
(304, 'Matthew White', '1414141414', 'matthew@email.com', 'Address 14, City 14'),
(305, 'Olivia Green', '1515151515', 'olivia@email.com', 'Address 15, City 15');
```

Each insertion has happened in Person will lead to connection with each table for customer and worker and manager of hotels

Customer

```
-- Insert random values into Customer tablel
NSERT INTO Customer (Person_ID, Membership_Type, Membership_Expiry) VALUES
(101, 'Gold', '2024-01-01'), (
102, 'Silver', '2023-08-15'),
(103, 'Bronze', '2023-12-31'),
(104, 'Platinum', '2023-11-30'),
(105, 'Gold', '2023-09-20');
```

Worker

```
-- Insert random values into Worker table
INSERT INTO Worker (Person_ID, Job_Title, Hire_Date) VALUES
(201, 'Receptionist', '2022-05-10'),
(202, 'Housekeeper', '2022-03-20'),
(203, 'Chef', '2022-06-15'),
(204, 'Maintenance Staff', '2022-02-08'),
(205, 'Concierge', '2022-04-25');
```

Manager

```
-- Insert random values into Manager table
INSERT INTO Manager (Person_ID, Department, Manager_Since) VALUES
(301, 'Front Desk', '2022-07-01'),
(302, 'Kitchen', '2022-08-01'),
(303, 'Guest Services', '2022-06-01'),
(304, 'Housekeeping', '2022-04-01'),
(305, 'Maintenance', '2022-03-01');
```

Working AT

```
-- Insert random values into Working_AT table
INSERT INTO Working_AT (Person_ID, Hotel_ID) VALUES
(201, 501), (202, 502), (203, 503), (204, 504), (205, 505),
(301, 501), (302, 502), (303, 503), (304, 504), (305, 505);
```

Some Queries? Let’s make some of them now

Retrieve all hotels along with their events

```
SELECT Hotel.Name, Event.Event_type, Event.Date_Event, Event.Description
FROM Hotel
JOIN Event ON Hotel.Hotel_ID = Event.Hotel_ID;
```

Name	Event_type	Date_Event	Description
Grand Hotel	Conference	2023-02-15	Annual Business Conference
Seaside Resort	Wedding	2023-05-20	John and Alice Wedding
Mountain Lodge	Concert	2023-08-10	Summer Music Festival
Urban Oasis	Meeting	2023-11-30	Board of Directors Meeting
Countryside Inn	Party	2023-12-31	New Year Celebration

Find the average room price for each hotel

```
SELECT Hotel.Name, AVG(Room.Price) AS Average_Price
FROM Hotel
JOIN Room ON Hotel.Hotel_ID = Room.Hotel_ID
GROUP BY Hotel.Name;
```

Name	Average_Price
Countryside Inn	200.0
Grand Hotel	100.0
Mountain Lodge	150.0
Seaside Resort	200.0
Urban Oasis	100.0

Retrieve the names of managers and their respective hotels

```
SELECT Person.Name AS Manager_Name, Manager.Department, Hotel.Name AS Hotel_Name
FROM Manager
JOIN Person ON Manager.Person_ID = Person.Person_ID
JOIN Working_AT ON Manager.Person_ID = Working_AT.Person_ID
JOIN Hotel ON Working_AT.Hotel_ID = Hotel.Hotel_ID;
```

Manager_Name	Department	Hotel_Name
Sarah Johnson	Front Desk	Grand Hotel
Ryan Smith	Kitchen	Seaside Resort
Emma Brown	Guest Services	Mountain Lodge
Matthew White	Housekeeping	Urban Oasis
Olivia Green	Maintenance	Countryside Inn

List available rooms for a specific hotel

```
SELECT Hotel.Name, Room.Room_Number, Room.Type
FROM Hotel
JOIN Room ON Hotel.Hotel_ID = Room.Hotel_ID
WHERE Room.Availability = 'Available'
```

Name	Room_Number	Type
Grand Hotel	101	Standard
Seaside Resort	202	Suite
Mountain Lodge	303	Deluxe
Urban Oasis	404	Standard
Countryside Inn	505	Suite

List Highest Rated Hotels

```
SELECT Person.Name, COALESCE(Worker.Job_Title, 'Not Worker') AS Job_Title,
COALESCE(Manager.Department, 'Not Manager') AS Department
FROM Person
JOIN Working_AT ON Person.Person_ID = Working_AT.Person_ID
LEFT JOIN Worker ON Person.Person_ID = Worker.Person_ID
LEFT JOIN Manager ON Person.Person_ID = Manager.Person_ID;
```

Name	Job_Title	Department
John Doe	Receptionist	Not Manager
Jane Smith	Housekeeper	Not Manager
Michael Johnson	Chef	Not Manager
Emily White	Maintenance Staff	Not Manager
David Brown	Concierge	Not Manager
Sarah Johnson	Not Worker	Front Desk
Ryan Smith	Not Worker	Kitchen
Emma Brown	Not Worker	Guest Services
Matthew White	Not Worker	Housekeeping
Olivia Green	Not Worker	Maintenance

Find the top-rated hotel along with the count of events hosted in each hotel

```
SELECT
Hotel.Name AS Hotel_Name,  Hotel.Rating,
COUNT(Event.Event_ID) AS Event_Count
FROM Hotel
JOIN Event ON Hotel.Hotel_ID = Event.Hotel_ID
GROUP BY Hotel.Hotel_ID, Hotel.Name, Hotel.Rating
HAVING  Hotel.Rating >= 4
ORDER BY Hotel.Rating DESC, Event_Count DESC;
```

Hotel_Name	Rating	Event_Count
Grand Hotel	5	1
Seaside Resort	4	1
Mountain Lodge	4	1

And That's All

Python GUI code is provided also