HOTEL MANAGMENT SYSTEM

Hotel Assignment

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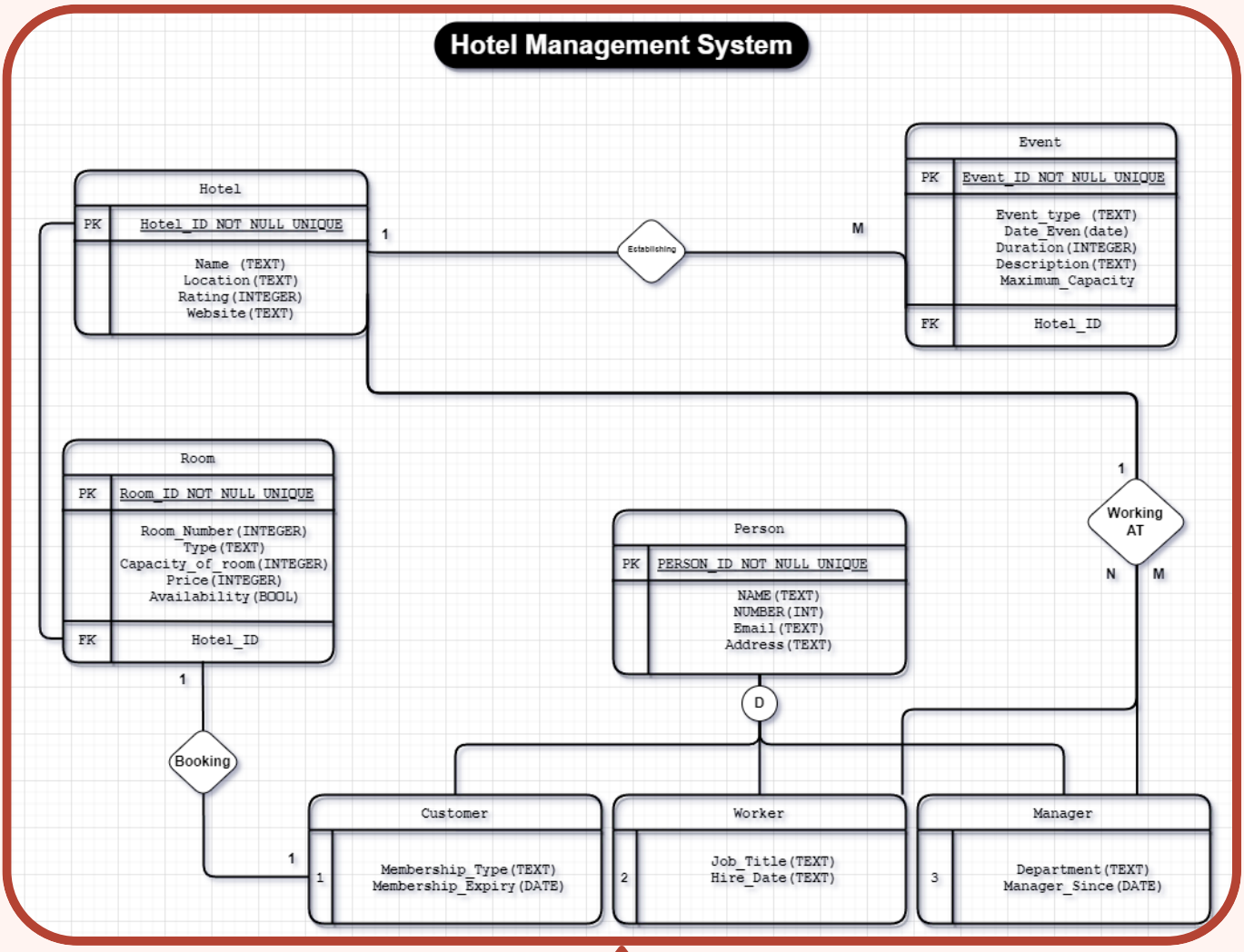
We've established firstly 4 entities and the entity parent of person "As Parent" which focus on 3 Childs

Customer: to save data of our audience

Worker: as janitor or waiter etc.

manager: 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.

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)

```
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) );
```

Some Example Queries!

Hotel

```
INSERT INTO Hotel (Hotel_ID, Name, Location, Rating, Website) VALUES
(1, 'Grand Hotel', 'London', 5, 'www.grandhotel.com'),
(2, 'Seaside Resort', 'Brighton', 4, 'www.seasideresort.com'),
(3, 'City Plaza', 'Manchester', 3, 'www.cityplaza.com'),
(4, 'Highland Inn', 'Edinburgh', 4, 'www.highlandinn.com'),
(5, 'Sunny Retreat', 'Bath', 5, 'www.sunnyretreat.com');
```

Event

```
INSERT INTO Event (Event_ID, Event_type, Date_Event, Duration, Description,
Maximum_Capacity, Hotel_ID) VALUES
(1, 'Conference', '2023-11-15', 3, 'Industry conference', 150, 1),
(2, 'Wedding', '2023-12-20', 1, 'Wedding ceremony', 100, 2),
(3, 'Seminar', '2023-10-10', 2, 'Educational seminar', 80, 3),
(4, 'Concert', '2023-09-25', 2, 'Music concert', 200, 4),
(5, 'Exhibition', '2023-12-05', 1, 'Art exhibition', 120, 5);
```

Room

```
INSERT INTO Room (Room_ID, Room_Number, Type, Capacity_of_room, Price,
Availability, Hotel_ID) VALUES
(1, 101, 'Standard', 2, 150, true, 1),
(2, 202, 'Suite', 4, 300, true, 2),
(3, 303, 'Deluxe', 3, 250, true, 3),
(4, 102, 'Standard', 2, 160, true, 4),
(5, 203, 'Suite', 4, 320, true, 5);
```

creating one relation for root class, with all attributes of main class to make it easier to distinguish each table, so we will drop person table and change schema of each table for customer, worker and manager

“Null Model”

Customer

```
-- Inserting sample data into the Customer table
INSERT INTO Customer (Customer_ID, Name, Number, Email, Address, Membership_Type, Membership_Expiry)
VALUES
(1, 'Sarah Johnson', 1112223333, 'sarah@example.com', '321 Main Street, Manchester', 'Gold', '2024-12-31'),
(2, 'Michael Clark', 4445556666, 'michael@example.com', '18 Side Lane, Birmingham', 'Silver', '2024-10-15'),
(3, 'Emma White', 3334445555, 'emma@example.com', '8 Riverside Drive, Liverpool', 'Bronze', '2024-11-30'),
(4, 'Daniel Green', 6667778888, 'daniel@example.com', '30 Park Lane, Birmingham', 'Silver', '2024-10-10'),
(5, 'Ava Taylor', 9990001111, 'ava@example.com', '20 Sunnyside Street, Glasgow', 'Gold', '2024-12-25');
```

Worker

```
-- Inserting sample data into the Worker table
INSERT INTO Worker (Worker_ID, Name, Number, Email, Address, Job_Title, Hire_Date, Hotel_ID) VALUES
(1, 'John Smith', 1234567890, 'john@example.com', '123 High Street, London', 'Receptionist', '2023-01-15', 1),
(2, 'Emily Brown', 9876543210, 'emily@example.com', '45 Seaside Avenue, Brighton', 'Manager', '2023-03-20', 2),
(3, 'David Wilson', 5556667777, 'david@example.com', '75 Hilltop Road, Manchester', 'Housekeeping', '2022-11-10', 3),
(4, 'Sophie Clark', 4443332222, 'sophie@example.com', '5 Central Avenue, Edinburgh', 'Chef', '2023-05-05', 4),
(5, 'Oliver Turner', 1112223333, 'oliver@example.com', '10 Tranquil Street, Bath', 'Waiter', '2023-02-28', 5);
```

Manager

```
-- Inserting sample data into the Manager table
INSERT INTO Manager (Manager_ID, Name, Number, Email, Address, Department, Manager_Since) VALUES
(1, 'Robert Anderson', 7778889999, 'robert@example.com', '99 Front Avenue, Edinburgh', 'Operations', '2023-01-10'),
(2, 'Sophie Turner', 3334445555, 'sophie@example.com', '55 Back Street, Glasgow', 'HR', '2023-04-05'),
(3, 'Henry White', 2221113333, 'henry@example.com', '15 Oakwood Court, Sheffield', 'Finance', '2023-02-20'),
(4, 'Lily Moore', 8887776666, 'lily@example.com', '28 High Road, Leeds', 'Sales', '2023-03-15'),
(5, 'Ethan Baker', 4445556666, 'ethan@example.com', '7 West Street, Bristol', 'Marketing', '2023-05-01');
```

Some Impressive Queries

1. Retrieve Worker details along with associated Hotel information

```
SELECT w.*, h.Name AS Hotel_Name, h.Location FROM Worker w
JOIN Hotel h ON w.Hotel_ID = h.Hotel_ID;
```

Worker_ID	Name	Number	Email	Address	Job_Title	Hire_Date	Hotel_ID	Hotel_Name	Location
1	John Smith	1234567890	john@example.com	123 High Street, London	Receptionist	2023-01-15	1	Grand Hotel	London
2	Emily Brown	9876543210	emily@example.com	45 Seaside Avenue, Brighton	Manager	2023-03-20	2	Seaside Resort	Brighton
3	David Wilson	5556667777	david@example.com	75 Hilltop Road, Manchester	Housekeeping	2022-11-10	3	City Plaza	Manchester
4	Sophie Clark	4443332222	sophie@example.com	5 Central Avenue, Edinburgh	Chef	2023-05-05	4	Highland Inn	Edinburgh
5	Oliver Turner	1112223333	oliver@example.com	10 Tranquil Street, Bath	Waiter	2023-02-28	5	Sunny Retreat	Bath

2.Show Customer and their Membership details:

SELECT c.*, c.Membership_Type, c.Membership_Expiry FROM Customer c;

Customer_ID	Name	Number	Email	Address	Membership_Type	Membership_Expiry	Membership_Type	Membership_Expiry
1	Sarah Johnson	1112223333	sarah@example.com	321 Main Street, Manchester	Gold	2024-12-31	Gold	2024-12-31
2	Michael Clark	4445556666	michael@example.com	18 Side Lane, Birmingham	Silver	2024-10-15	Silver	2024-10-15
3	Emma White	3334445555	emma@example.com	8 Riverside Drive, Liverpool	Bronze	2024-11-30	Bronze	2024-11-30
4	Daniel Green	6667778888	daniel@example.com	30 Park Lane, Birmingham	Silver	2024-10-10	Silver	2024-10-10
5	Ava Taylor	9990001111	ava@example.com	20 Sunnyside Street, Glasgow	Gold	2024-12-25	Gold	2024-12-25

3.List Manager details and their respective Departments

SELECT m.*, m.Department FROM Manager m;

Manager_ID	Name	Number	Email	Address	Department	Manager_Since	Department
1	Robert Anderson	7778889999	robert@example.com	99 Front Avenue, Edinburgh	Operations	2023-01-10	Operations
2	Sophie Turner	3334445555	sophie@example.com	55 Back Street, Glasgow	HR	2023-04-05	HR
3	Henry White	2221113333	henry@example.com	15 Oakwood Court, Sheffield	Finance	2023-02-20	Finance
4	Lily Moore	8887776666	lily@example.com	28 High Road, Leeds	Sales	2023-03-15	Sales
5	Ethan Baker	4445556666	ethan@example.com	7 West Street, Bristol	Marketing	2023-05-01	Marketing

4.Get Worker details for a specific Hotel using a subquery

SELECT m.*, m.Department FROM Manager m;

Worker_ID	Name	Number	Email	Address	Job_Title	Hire_Date	Hotel_ID
1	John Smith	1234567890	john@example.com	123 High Street, London	Receptionist	2023-01-15	1

5.Create a view of available rooms in each hotel

```
CREATE VIEW AvailableRooms AS
SELECT h.Name AS Hotel_Name, r.Room_Number, r.Type, r.Price
FROM Hotel h
INNER JOIN Room r ON h.Hotel_ID = r.Hotel_ID
WHERE r.Availability = true;
SELECT * FROM AvailableRooms
```

Hotel_Name	Room_Number	Type	Price
Grand Hotel	101	Standard	150
Seaside Resort	202	Suite	300
City Plaza	303	Deluxe	250
Highland Inn	102	Standard	160
Sunny Retreat	203	Suite	320

6.Generate a report by combining Customer and Manager details using UNION

```
SELECT Name, 'Customer' AS Role FROM Customer
UNION
SELECT Name, 'Manager' AS Role FROM Manager;
```

Name	Role
Ava Taylor	Customer
Daniel Green	Customer
David Wilson	Worker
Emily Brown	Worker
Emma White	Customer
Ethan Baker	Manager
Henry White	Manager
John Smith	Worker
Lily Moore	Manager
Michael Clark	Customer
Oliver Turner	Worker
Robert Anderson	Manager
Sarah Johnson	Customer
Sophie Clark	Worker
Sophie Turner	Manager

7.Create an index on the 'Membership_Type' column in the Customer table:

```
CREATE INDEX idx_membership_type ON
Customer(Membership_Type);
-- Query using the index on the 'Membership_Type' column
SELECT *
FROM Customer
WHERE Membership_Type = 'Gold';
```

Customer_ID	Name	Number	Email	Address	Membership_Type	Membership_Expiry
1	Sarah Johnson	1112223333	sarah@example.com	321 Main Street, Manchester	Gold	2024-12-31
5	Ava Taylor	9990001111	ava@example.com	20 Sunnyside Street, Glasgow	Gold	2024-12-25

And That's All

Python GUI code is provided also