Deliverable 1

CSI2132 – Databases 1

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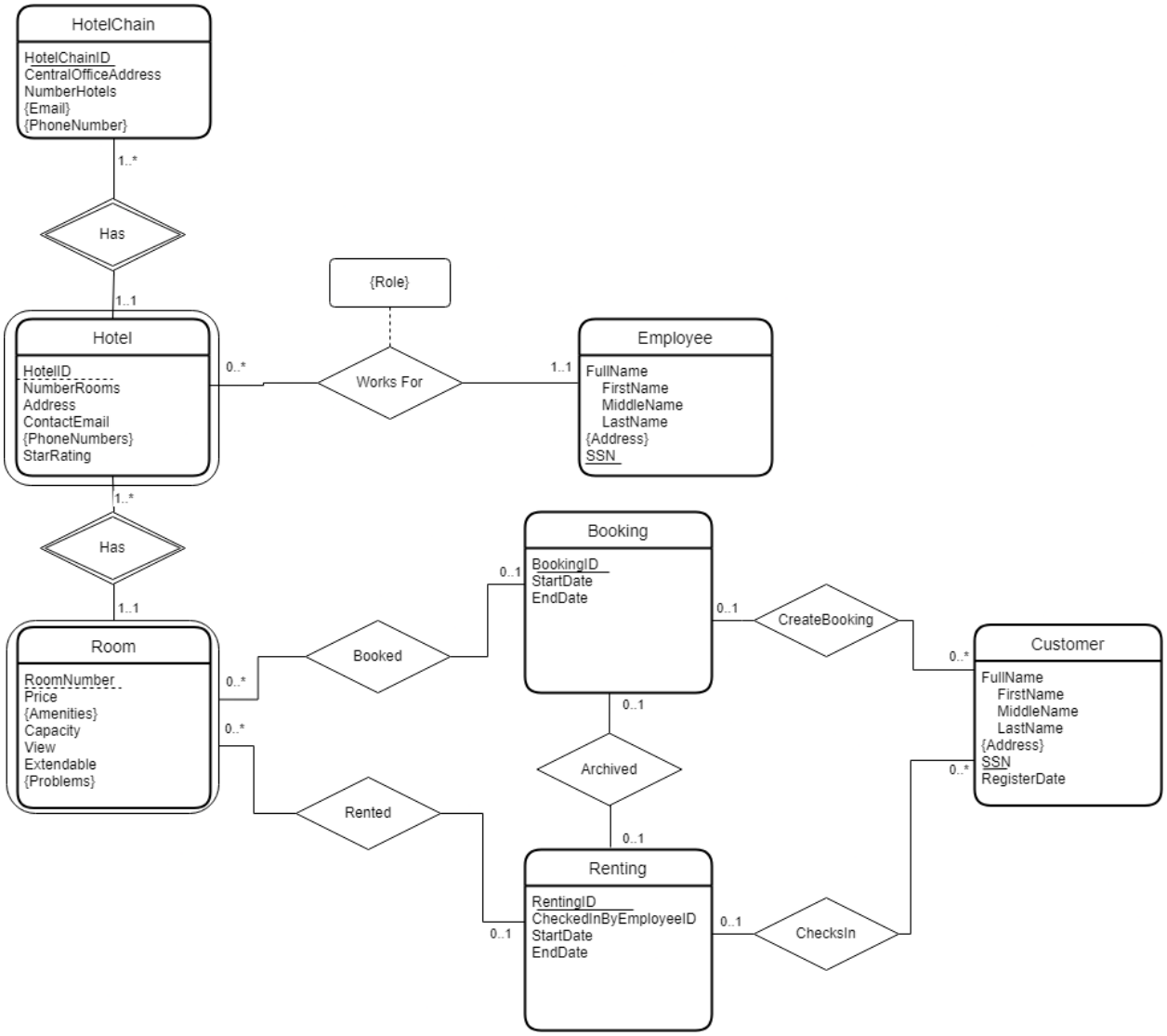
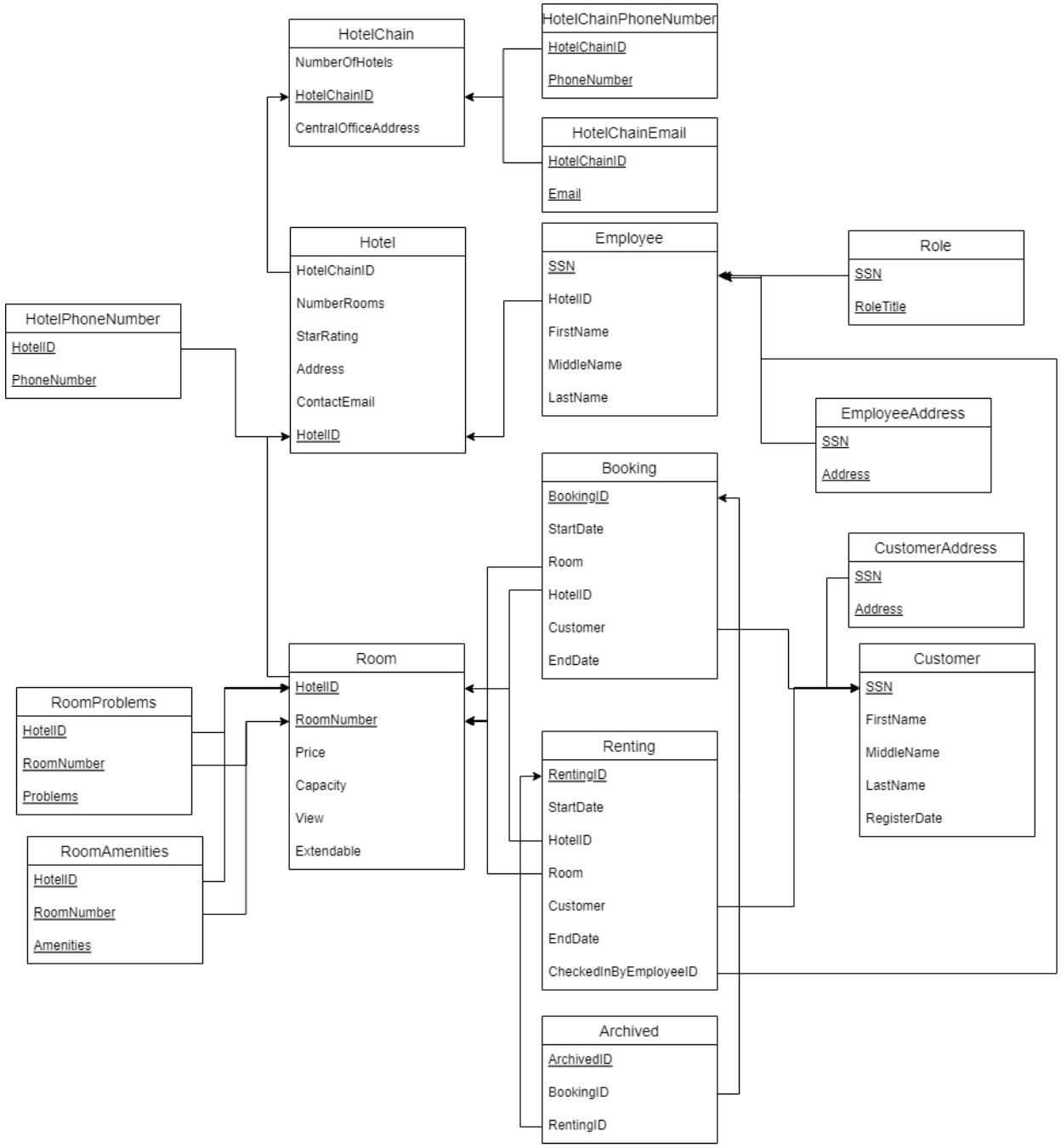
ER Diagram



Explanation: A HotelChain has a 1-to-Many relation with Hotel since a HotelChain may own multiple hotels. A hotel will have many employees working with different roles which are represented by a 1-to-Many relation. The Hotel is also a weak entity since it cannot exist without an associated HotelChain. Since a Hotel has many rooms and a room belongs to a hotel (can't exist without a hotel) a room is a weak entity with a many to 1 relationship with the Hotel. A Customer may create multiple bookings for different rooms at different times. A customer can have multiple rentings (1 current one and many in the past) and each renting has 1 customer. A Room can have multiple bookings (at different times that don't overlap) and a booking is associated with one room. A Room can have multiple rentings (at different times that don't overlap) and a renting is associated with one room. Booking and Renting may be archived.

Relational Database Schema



Explanation: From our ER diagram we have expanded all the multivalued attributes into their own tables (ie HotelChainPhoneNumber, HotelChainEmail, RoomProblems, RoomAmenities, HotelPhoneNumber, Role, EmployeeAddress,and CustomerAddress. The Archived table holds old rentings and their associated bookings (if applicable). More information about primary and foreign keys are in the constraints section.

Constraints

HotelChain:
- Primary Key (HotelChainID)
- NumberOfHotels equal to the count of hotels in the hotel chain >= 0

HotelChainPhoneNumber
- Primary Key (HotelChainId, PhoneNumber)
- Foreign Key (HotelChainID) References HotelChain

HotelChainPhoneEmail
- Primary Key (HotelChainId, Email)
- Foreign Key (HotelChainID) References HotelChain

Hotel
- Primary Key (HotelID)
- Foreign Key (HotelChainId) References HotelChain
- StarRating domain is {1,2,3,4,5}
- NumberRooms equal to the count of room in the hotel >= 0

HotelPhoneNumber
- Primary Key (HotelId, PhoneNumber)
- Foreign Key (HotelID) References Hotel

Room:
- Primary Key (HotelID, RoomNumber)
- Room Price >= 0 (no negative prices)
- Room capacity >= 1 (room must be able to accommodate at least 1 person)
- Room Availability constraint - Ensure the room is only assigned to 1 customer to prevent double bookings
- View domain is {sea view, mountain view} not null
- Extendable {true. False} (not null)

RoomAmenities
- Primary Key (HotelID, RoomNumber, Amenities)
- Foreign Key (HotelID, RoomNumber) References Room

RoomProblems
- Primary Key (HotelID, RoomNumber, Problems)
- Foreign Key (HotelID, RoomNumber) References Room

Booking:

- Primary Key (BookingID)
- Booking Constraint - Ensures a customer can only book 1 room for their given renting period

Renting:

- Primary Key (RentingID)
- Renting Constraint - Ensures a customer can only be renting 1 room at a time

Archived

- Primary Key (ArchivedID)
- Foreign Key (BookingID) reference (BookingID)
- Foreign Key (RentingID) reference (RentingID)

Employee:

- Primary Key (SSN)
- Hotel Manager Constraint - At least 1 employee must have the Role “Manager” for each Hotel

EmployeeAddress

- Primary Key (SSN, Address)
- Foreign Key (SSN) References Employee

Role

- Primary Key (SSN, Role)
- Foreign Key (SSN) References Employee

Customer:

- Primary Key (SSN)

CustomerAddress

- Primary Key (SSN, Address)
- Foreign Key (SSN) References Customer