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CIS4301, Fall 2019
Prof. Alin Dobra
Assignment 1

Task II – Conversion of E/R Diagram to Relations

Converted Relations:

- **Guest(**name,
  address,
  zip_code,
  phone_number,
  id,
  reservation_id (fk: references Reservation.id)**)**
- **Credit_Card(**number,
  security_code,
  expiration_date,
  guest_id (fk: references Guest.id)**)**
- **Bill(**total,
  time-date,
  invoice_number,
  guest_id (fk: references Guest.id)**)**
- **Reservation(**id,
  reserved_check-in_time-date,
  reserved_check-out_time-date,
  stay_fee,
  stay_check-in_time-date,
  stay_check-out_time-date**)**
- **Hotel(**zip_code,
  address,

phone_number,

id**)**

- **Maintenance_Issue(**estimated_fee,

  id,

  discovered_time-date,

  resolved_time-date,

  room_number (fk: references Room.room_number),

  hotel_id (fk: references Room.hotel_id)**)**

- **Amenity(**fee,

  name,

  time-date,

  id,

  room_number (fk: references Room.room_number),

  hotel_id (fk: references Room.hotel_id)**)**

- **Room(**type,

  room_number,

  hotel_id**)**

- **Stayed(**reservation_id (fk: references Reservation.reservation_id),

  room_number (fk: references Room.room_number),

  hotel_id (fk: references Room.hotel_id)**)**

- **Reserved(**reservation_id (fk: references Reservation.reservation_id),

  room_number (fk: references Room.room_number),

  hotel_id (fk: references Room.hotel_id)**)**

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These relations do not enforce all of the semantic integrity constraints that I have specified in my E/R diagram. **Namely, the following semantic integrity constraints were lost:**

- There can be at most 1 guest associated with a reservation.
- There can be at most one credit card associated with a guest.
- There must be 1 or more rooms associated with a stay.

Assumptions and interpretations that I made:

- The hotel entity represents a particular hotel and its location.
- "*A guest may reserve a room if the room is available at the requested date and time.*" –this was not included in my ER diagram but is enforced by the software controlling the database, the controller can query to see if a room is occupied by searching through the reservations and stays in a particular date range.
- As given in the instructions, a stay and a reservation consist of the same core set of attributes, one stay corresponds to one reservation, and they both share the same primary key (the reservation id). I made the choice to combine them into one entity set in my ER diagram and my relational model. As a result, the reservation additionally has the attributes of the stay.
- "*If a room is found to be damaged after a guest checks out, the estimated fee is added to the guest's bill*", "*At checkout an itemized bill is generated for each guest. A bill includes the date and time, invoice number, and total.*" – I made the interpretation that when the bill is generated, the controlling software can query the rooms that were associated with a particular guest's stay and for each room associated with the stay, query the maintenance issues for that room within that time frame. This way, when the software generates the bill and calculates the total, we can include this information when we store the bill in the database.