Pooja Desur 2019101112
Mehul Mathur 2019101046
Manasvi Vaidyula 2019101012

Team Newt

Phase #1 - Requirement

Overview:

This mini-world is a hotel called **The Quokka**. The most special part about The Quokka and the reason it's so popular is because it's also got all types of tourist spots within close vicinity! From beaches to trekking points to national parks, The Quokka is the place to stay for the ultimate tourism experience.

A guest who stays at The Quokka can visit any of the tourist spots along with a tour guide, who is affiliated with the hotel, using the hotel's transport.

This database stores information about the employees who currently work at the hotel, guests who are presently residing in one of the rooms, the vehicles the hotel owns for transport to tourist locations, and the locations they provide tour guides for.

The users of the database would be the hotel staff. It would be used while guests are booking a room or booking a day out to a tourist spot. It can also be used to check up on employees and the location details.

Any other factors like extra hotel facilities(food service,gym), infrastructural requirements(electricity, furniture), medical services(in case of an emergency) are not included in this database.

Entities:

This mini-world consists of 5 strong entities and 2 weak entities given as follows.

(Primary key donated by *)

1. **Room**
    a. Room Number*
    b. Floor Number
    c. Availability of the room
    d. Cost
    e. Number of Beds
2. **Guest**
    a. Booking ID*

b. Contact Info* *(Composite attribute)*
    i. Phone Number *(Multivalued)*
    ii. Email Id *(Multivalued)*
c. Full Name
d. Address
    i. State
    ii. Country
e. Total Members guest is booking for
f. Check-in Date
g. Check-out Date
h. Duration of Stay *(Derived attribute : (check-out Date - check-in Date)*

3. Staff **(***has more than two key attributes)*

There is a partial relationship with the staff and the subclasses. Employees who are not maids and tour guides also work at the hotel.

a. Social Security Number*
b. Staff ID Number*
c. Full Name
d. Date of joining
e. Age
f. Monthly wages
g. Contact Info* *(Composite attribute)*
    i. Phone Number *(Multivalued)*
    ii. Email Id (*Multivalued*)

<u>Subclasses -</u>

1. Maid Service
    a. Floor Number maid is in charge of
    b. Type of Cleaning Activity

2. Tour Guide
    a. Years of Experience

4. Transport

a. Number Plate*
b. Timings
c. Cost per hour
d. Availability

5. Tourist Location-

a. Latitude, Longitude*
b. Location Name
c. Average crowd
d. Opening timing
e. Closing timings
f. Usual weather

Weak Entities:

1. FAMILY - *Identifying entity* : GUEST
    a. Names
    b. Age

2. RECREATIONAL SPOT - *Identifying entity* : TOURIST LOCATION
    a. Type (Restaurant, Parksn)

Relationships

The following binary relationships can exist between entities -

1. Guest -> Room -: RESERVES

    Constraints :
    Cardinality Ratio : (1 : N)
    Guest (total Participation) , Room(Partial Participation)
    Min-Max : Guest(1,n) , Room (0,1)

    a. On arriving at the hotel, *one* guest can book *one or many* rooms.

2. Maid -> Room -: CLEANS

    Constraints:
    Cardinality Ratio : (N : M)
    Maid (total participation) , Room(total participation)
    Min max : Maid(1 , n) , Room(1 , n)

    a. A maid can clean *many* rooms on their assigned floor, and a room can be cleaned by *many* maids.

3. Maids -> Maids -: SUPERVISES

    Constraints:
    Cardinality Ratio : (1:N)
    Supervisor (partial participation) Supervisee (partial participation)
    Min max - Supervisor(0 , n) Supervisee(0,1)

a. This is a recursive relationship.
b. For the subclass Maid service, on each floor, there is *a Supervisor (also a maid)* who manages *all the other* maids on that floor.

Weak entity Relations :

4. Guest -> Family (Identifying Relationship)

   Constraints:
   Cardinality Ratio : (1 : 1)
   Guest (partial participation) , Family (total participation)
   Min Max : Guest (0,1) Family(1,1)

   Each Guest can either have *no family :(or one family.*

5. Tourist Location -> Recreational Spots (Identifying Relationship)

   Constraints:
   Cardinality Ratio : (1 : N)
   Location (partial participation) , Recreational spots(Total Participation)
   Min Max : Tourist Location(0,n) Extra Facility(1,n)

   A Tourist Location can have *none or many* recreational spots

(n>3) Relationship

6. Guest -> Tourist Guide -> Transport -> Tourist Location -: TRIP BOOKING

A guest can book a hotel vehicle to visit some of the amazing tourist locations guided by a tourist guide who works at the hotel. Everything is easy to plan and book at Hotel Quokka!

One guest can book *a minimum of 0 cars* and *at max any number of cars (*if this guest has a massive family) in one trip. Each trip can go to a *minimum of 1 location* and *at max any number of locations*. Only *one* tourist guide can be part of this booking.

(For example, taking 2 cars to a location is considered as 2 different relationships and going to 3 locations during the same trip in 3 different relationships).

Constraints -
Guest : min,max : (0,n) , partial participation
Tourist Guide : min,max : (1,n), total participation
Each tourist guide
Location: min,max : (0,n), total participation

A location can be visited by none to any number of guests
Transport : min,max : (0,n), total participation
(a car may or may not be used hence the min is 0 and can be used by many guests)

Functional Requirements

1. **Retrievals**

    a. Selections

        i. Select and show all details of available rooms. A guest can then see the details of the room he/she wants during the booking process.

        ii. Select details of tourist transport vehicles with a particular timing.

    b. Projections

        i. Show Booking IDs of all guests staying more than a week.

    c. Aggregations

        i. AVG - average salary of Staff Entity subclasses: tourist guides, maids can be pulled up by the hotel staff when discussing annual budget distributions.

        ii. SUM -Total number of guests arriving at a particular date.

        iii. MAX - Salary of highest-paid staff members from each subclass.

        iv. MIN - Least expensive price of any available room can be pulled up for a guest looking for affordable options.

    d. Searching

        i. Searching the database for a staff employee by name.
        ii. Search database for a currently residing guest by name.

    e. Analysis

        i. Total money spent by a guest (room cost + tourist vehicle cost).

            Each guest will pay his total bill for hotel facilities (excluding food, or other personal expenditure during their time of stay) while checking out. This is calculated from GUEST, ROOM, TOURIST TRANSPORT entities.

ii. Display all the maids who have been assigned to clean the least number of rooms along with the number of rooms they've cleaned.

    While assigning work to maids, it would be more efficient to divide the work up evenly.

2. Modifications

i. The guest enters hotel (insert)
ii. The guest leaves hotel (delete)
iii. Update room - available/non - available, when a guest enters or leaves.