



ASSIGNMENT 1

Business Description for Database

A resort management company for tenants needs to build a database for the following information:

Resort has **branches**, each branch is located in a different province across the country. The system needs to save the **address**, **phone** number, contact **email** address, and **pictures** of each branch. Each **branch** has many **zones**. Zone **names** (eg: beach area, garden, etc. or zone A, zone B, zone C...) are placed only in a branch.

Each **branch** offers several **room types**. The number of rooms and the price of each room type may vary from branch to branch. Each type of room will have regulatory information about: **number of beds**, **size of each bed**, **maximum number of guests** allowed, **room area** (there may be a difference from reality), **list of supplies with number quantity**, **rent** and **other** description. For example: family room type has 1 bed 1m8, 2 beds 1m, maximum 4 guests, 25m², 1 refrigerator, 1 television, 1 TV remote, 1 air conditioner, 1 tea table, 4 chairs... price 1 million /day. The information of the same room type will be the same in all branches.

Room ID

Zone

Each **room** of the resort needs to have information about the **number of rooms**, the **type** of room, in which **area**, the **condition of the supplies** in the room (new, scratched, in need of maintenance, need to be replaced, ...). For example: room 101, Ho Chi Minh City branch is a single room type, the garden, the dressing table is scratched in the left corner, etc. The system can always look up the status information of each room at any time (also vacant or rented). Supplies at each branch also need to be **managed** accurately the **status** of each one, the **location** of the supplies (in which room, or in the stockpile). Each branch is allowed to choose its own supplier for each type of material, each type of material, only one supplier. For example, in HCMC branch, all tea tables are provided by DP Furniture, but in Da Lat branch, it is responsible by TX company. The **supplier**, including the supplier's **name**, **address**, and **email** contact, will assist with the delivery and maintenance of the supplies. A supplier can cooperate with many different branches, providing different types of supplies.

Guests can **book rooms** online on the resort's website. When booking, customers need to provide information: CCCD/**ID**, **full name**, **phone** number, contact **email**, **branch**, **number of guests**, **check-in date**, **check-out date**. The system will display the available room types according to the customer's requirements. Next, the customer selects the room type, the desired number of rooms, the amount to be paid will be automatically calculated. After successful booking, the system will respond to customers with **booking code**, **date and time of booking** and registered customer information. Guests need to make payment at least 36 hours before check-in date. Reservations will be canceled if payment is not made on time. Guests can cancel the reservation at least 24 hours before the check-in date and receive a full refund of the paid amount. Failure to cancel on time or failure to show up on the date of registration will result in a charge of one day's rental and cancellation of the application. Information on the date and time when guests arrive at check-in and check-out also need to be saved.

In addition, the resort also **offers room rental package** by year. Each package will have a **price**, **maximum total days rented**, **maximum number of guests per rental**. **Customers** who **buy** the **package**, will be able to stay at any branch at any time of the year, the room type is arbitrarily selected from the list of available rooms, just within the allowed number of days. For example:

- Package A, price: 10 million/year, stay up to 14 days, maximum 2 people at a time.
- Package B, price: 20 million/year, stay up to 14 days, maximum 4 people each time.

When a customer has registered for a package, at the time of booking, they will provide the name of the purchased package they want to apply to (1 booking can only choose 1 package). The system will check the registration information, the number of remaining days, the number of guests allowed is valid or not. If it is not valid (number of days exceeded, number of guests exceeded), the customer needs to re-register: one application suitable for package information, another application for out-of-package requirements. Customer's stay information under package service needs to be saved, similar to normal room rental registration.

For more convenience, customers can register as a member (login with username, password), to accumulate points and enjoy preferential policies of the resort. Depending on accumulated points, customers are divided into: Potential customers (<50 VND ~ 50 million VND), Loyal customers (<100 VND), VIP customers (<1000 VND) and SuperVIP customers (>= 1000 VND). .

- Loyal customers get 10% off when booking.
- VIP customers get 15% off when booking and 1 extra day when buying service package room rental (reduce 15% and increase the number of days of use).
- SuperVIP customers get 20% off when booking and 2 extra days when buying package room service.

At each branch, the resort will reserve some space for the service party to rent for business. Site information includes: No. of ground, length, width, location in which area, more description. There are the following types of services: restaurants, spas, convenience stores, souvenirs, bars. The lessee needs to provide information to the resort: business name, store name, representative logo, image, customer service time (there may be many operating hours of the day). The restaurant needs to provide more information about the style of the dish (Vietnamese, European, Chinese, etc.), the maximum number of guests. Spa: the services provided. Souvenirs: goods, brands. The rental price depends on the location and area of the premises and is determined by each branch. A business can lease some premises at one/many branches. The lessee needs to pay the rent one month in advance at the end of the lease year to be able to continue operating for the next year. The system will send a reminder when the rental payment is near due.

At the end of each month, the company needs to export statistical reports, such as: total monthly revenue of the whole system / each branch, the total number of tenants of the whole system / each branch (including the number of guests of package services), the average occupancy rate of the whole system / each branch. The student group noted that it is necessary to provide enough data to make this statistical information.

Requirement:

1. Draw an EER Diagram for the database according to the descriptions above (6 marks).
2. Map EER Diagram to relational data schema (3 marks).
3. Find and describe semantic constraints (not yet appearing in ERD) (1 mark).