**Seminar**

**Hotel Chain**

**Team BHV**

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**Distributed Database Schema**

1.1         Global Database Tables

We have six global tables. They are***Hotel, Room, Booking*** *and* ***Customers***. Their conceptual schemas are described below.

Table 1. Global tables

|  |
| --- |
| **Global Tables** |
| * ***Hotel* (**hotel\_id (varchar 50), hotel\_name (varchar 100), hotel type (float), hotel\_location (varchar max). * ***Rooms*** (room\_id (varchar 50), hotel\_id (varchar 50), room\_type (varchar 50), room\_status (numeric), room\_price (float)). * ***Booking***(booking\_id (int), room\_id (int), customer\_id (int), checkin\_date (date), checkout\_date (date), booking\_type (numeric), total\_payment (float)). * ***Customer***(customer\_id (int), customer\_name (varchar 100), customer\_mobile (int), customer\_email (varchar 100)). |

1.2         Table Description

* **Hotel: hotel\_id (varchar 50), hotel\_name (varchar 100), hotel type (float), hotel\_location (varchar max).**

Table 2. Description of Table “**Hotel Attributes**”

|  |  |  |  |
| --- | --- | --- | --- |
| **Item** | **Description** | **Type** | **Value** |
| **Hotel\_id (Pkey)** | The ID of the hotel | Varchar(50) | 1-100 no duplicate |
| **Hotel\_name** | The name of hotel | Varchar(100) | A string name |
| **Hotel\_type** | The type of the hotel | Float | The number of stars. |
| **Hotel\_location** | The location of the hotel | Varchar(max) | Location (address). |

Number of records: 100

* **Room: (room\_id (varchar 50), hotel\_id (varchar 50), room\_type (varchar 50), room\_status (numeric), room\_price (float).**

Table 3. Description of Table “Customer”

|  |  |  |  |
| --- | --- | --- | --- |
| **Item** | **Description** | **Type** | **Value** |
| **Room\_id (Pkey)** | The ID of room in the system. | Varchar (50) | 0001 => 1000, no duplicate |
| **Hotel\_id (Fkey)** | The ID of the hotel | Varchar(50) | 1 => 100, no duplicate |
| **Room\_type** | The type of the room | Varchar(50) | * Type 1: normal. * Type 2: business. * Type 3: VIP. |
| **Room\_status** | The status of the room | Numeric | * 1: available * 0: not available |
| **Room\_price** | Room’s price depend on type. | Float | * 100$ * 200$ * 300$ |

Number of records: 1000

* **Booking: booking\_id (int), room\_id (varchar 50), customer\_id (int), checkin\_date (date), checkout\_date (date), booking\_type (numeric), total\_payment (float).**

Table 4. Description of Table “Book”

|  |  |  |  |
| --- | --- | --- | --- |
| **Item** | **Description** | **Type** | **Value** |
| **Booking\_id (Pkey)** | The ID of booking service | int | 000001 => 100000, no duplicate |
| **Room\_id (Fkey)** | The ID of the room | Varchar (50) | 0001 => 1000, no duplicate |
| **Customer\_id** | The ID of the customer | int | 0000001 => 1000000, no duplicate |
| **Checkin\_date** | The date of checking-in | Datetime |  |
| **Checkout\_date** | The date of checking-out | Datetime |  |
| **Booking\_type** | The type of booking | Numeric | * 1: Online * 0: Offline |
| **Total\_payment** | The amount of payment after checking-out | Float |  |

Number of records: 100000

* **Customers: customer\_id (int), customer\_name (varchar 100), customer\_mobile (int), customer\_email (varchar 100).**

|  |  |  |  |
| --- | --- | --- | --- |
| **Item** | **Description** | **Type** | **Value** |
| **Customer\_id** | The ID of customer | Int | 0000001 => 1000000, no duplicate |
| **Customer\_name** | The name of the customer | Varchar(100) |  |
| **Customer\_mobile** | The phone number of the customer | Int |  |
| **Customer\_email** | The email of customer | Varchar(100) |  |

Number of records: 1000000

1.3         Fragmentation

* **Hotel: hotel\_id (varchar 50), hotel\_name (varchar 100), hotel type (float), hotel\_location (varchar max).**

Table 6. Vertical Fragmentation of Table “**Hotel**”

|  |  |
| --- | --- |
| **Fragmentation Name** | **Fragmentation Condition** |
| **Hotel.1** | hotel location = “VN” |
| **Hotel.2** | hotel\_location = “USA” |
| **Hotel.3** | hotel\_location = “UK” |

* **Room: room\_id (varchar 50), hotel\_id (varchar 50), room\_type (varchar 50), room\_status (numeric), room\_price (float).**

Table 7. Horizontal Fragmentation of Table “**Rooms**”

|  |  |
| --- | --- |
| **Fragmentation Name** | **Fragmentation Condition** |
| **Rooms.1** | Hotel\_id LIKE “VN%” |
| **Rooms.2** | Hotel\_id LIKE “US%” |
| **Rooms.3** | Hotel\_id LIKE “UK%” |

* **Booking: booking\_id (int), room\_id (varchar 50), customer\_id (int), checkin\_date (date), checkout\_date (date), booking\_type (numeric), total\_payment (float).**

Table 8. Horizontal Fragmentation of Table “Booking”

|  |  |
| --- | --- |
| **Fragmentation Name** | **Fragmentation Condition** |
| Booking.1 | Room\_id LIKE “VN%” |
| ***Booking.2*** | Room\_id LIKE “US%” |
| Booking.3 | Room\_id LIKE “UK%” |

* **Customers: customer\_id (int), customer\_name (varchar 100), customer\_mobile (int), customer\_email (varchar 100).**

|  |  |
| --- | --- |
| **Fragmentation Name** | **Fragmentation Condition** |
| **Customer.1** |  |

1.4         Allocation

Site Configuration: 3 sites deployed at 3 computers.

* **Scheme1: Basic Fragmentation**

Table 1. Allocation Scheme of Basic Fragmentation

|  |  |
| --- | --- |
| **At Site Name** | **Fragmentation Name** |
| **DB1 at Site 1** | Hotel.1, Room.1, Booking.1, Customer.1 |
| **DB2 at Site 2** | Hotel.2, Room.2, Booking.2, |
| **DB3 at Site 3** | Hotel.3, Room.3, Booking.3, |