



CLASS ASSIGNMENT #01

OOP

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Submission Date:	14 th October 2022

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Question: Solve the following scenario.

A hotel wants a system to manage its rooms and bookings.

Students must:

Create classes: Hotel, Room, Guest, and Booking.

Each Hotel has many Rooms.

Each Room can be booked by a Guest (aggregation relationship).

Implement encapsulation for attributes like room number, price, guest name, etc.

Add static variables/methods to track total bookings or rooms available.

Add methods:

bookRoom(Guest g)

cancelBooking()

getAvailableRooms()

Code:

```
import java.util.ArrayList;
```

```
class Guest {    private  
String name;    private  
String phone;  
  
    public Guest(String name, String phone)  
{        this.name = name;        this.phone =  
phone;  
    }
```

```
    public String getName() { return name; }  
    public String getPhone() { return phone; }
```

```
    @Override    public String  
toString() {        return name + " (" +  
phone + ")";  
    }  
}
```

```
class Room {    private int  
roomNumber;    private
```

```
double price;    private
boolean booked;   private
Guest guest;

public Room(int roomNumber, double price) {
this.roomNumber = roomNumber;
    this.price = price;
this.booked = false;
this.guest = null;
}

public int getRoomNumber() { return roomNumber;
}   public double getPrice() { return price; }   public
boolean isAvailable() { return !booked; }

public boolean bookRoom(Guest g) {
if (booked) {
    System.out.println("Room " + roomNumber + " is already booked.");
return false;
}
booked = true;
guest = g;
Hotel.totalBookings++;
System.out.println("Room " + roomNumber + " booked for " + g.getName());
return true;
}

public boolean cancelBooking() {
if (!booked) {
    System.out.println("Room " + roomNumber + " is not booked yet.");
return false;
}
booked = false;
guest = null;
Hotel.totalBookings--;
System.out.println("Booking cancelled for room " +
roomNumber);      return
true;
}
```

```

    @Override public String toString() { return "Room " +
roomNumber + " | Price: " + price + " | " + (booked ?
"Booked by " + guest.getName() : "Available");
    }
}

class Hotel { private String
name; private
ArrayList<Room> rooms;

    public static int totalRooms = 0;
    public static int totalBookings = 0;

    public Hotel(String name) {
this.name = name; this.rooms
= new ArrayList<>();
    }

    public void addRoom(Room r)
{ rooms.add(r);
totalRooms++;
    }

    public void showAvailableRooms() {
        System.out.println("\nAvailable Rooms in " + name +
":"); for (Room r : rooms) { if (r.isAvailable())
            System.out.println(" " + r);
        }
    }

    public Room findRoom(int number) {
for (Room r : rooms)
    if (r.getRoomNumber() == number) return r;
    return null;
    }
}

public class Main {
    public static void main(String[] args) {
Hotel h1 = new Hotel("Jhanjal Pura");

    // Add rooms    h1.addRoom(new
Room(101, 5000));

```

```
h1.addRoom(new Room(102, 6000));
h1.addRoom(new Room(201, 8000));

// Guests
Guest g1 = new Guest("Ali", "0333-1234567");
Guest g2 = new Guest("Zara", "0333-9876543");

// Booking      h1.findRoom(101).bookRoom(g1);
h1.findRoom(102).bookRoom(g2);
h1.findRoom(101).bookRoom(g2); // already booked

h1.showAvailableRooms();

// Cancel a booking
h1.findRoom(101).cancelBooking();
h1.showAvailableRooms();

System.out.println("\n Total Rooms: " + Hotel.totalRooms);
System.out.println("\n Total Bookings: " + Hotel.totalBookings);
}

}
```

Output:

```
"C:\Program Files\Java\jdk-23\bin\java.exe" "-javaagent:C:/Users/DELL/jersey/lib/jersey-agent.jar" "com.jersey.JerseyRoomBooking"
Room 101 booked for Ali
Room 102 booked for Zara
Room 101 is already booked.

Available Rooms in Jhanjal Pura:
Room 201 | Price: 8000.0 | Available
Booking cancelled for room 101

Available Rooms in Jhanjal Pura:
Room 101 | Price: 5000.0 | Available
Room 201 | Price: 8000.0 | Available

Total Rooms: 3

Total Bookings: 1

Process finished with exit code 0
```