



---

# CLASS ASSIGNMENT #01

---

OOP

Instructor: Mr. Mohsin Ahmed

Student Name:	Syeda Aima Abbas
Registration No:	FA24-BSE-010
Department:	Software Engineering
Submission Date:	14 <sup>th</sup> October 2022

COMSATS University Islamabad

## 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("Booki
ng 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" "-javaa
```

```
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
```