CS 200 - Introduction to Programming

Assignment 3 - Part-1

Due Date: **13th November, 2022**

LUMUN Accommodation Management System

Guidelines:

1. Do not share your code.
2. Naming Convention: RollNumber_A3P1.cpp
3. Only submit the .cpp file on LMS. Dropbox/email submissions will be given zero!
4. Do not plagiarize.

- **Your code should not crash in any case.**
- **All data members should be private.**
- **For each class write Setters and Getters for each data member.**
- **For each class write all types of Constructors and Destructors, i.e. Default constructor and Destructor, Parameter constructor, Copy constructor**
- **Failure in following the above rules can lead to deduction in marks**

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Total Marks: 100

LUMUN requires assistance from you to develop an Accommodation system to accommodate delegates on their final event LUMUN 23 which is going to be held from 1st January 2023 till 8th January 2023 . You have two ***Accommodation*** facilities: one facility for male delegates and one for female delegates.

The ***Male hostel*** has 40 rooms (you can assume room ids from 1 to 40) and only double occupancy is available.

The ***Female hostel*** has 30 rooms (you can assume room ids from 1 to 30) . There are two types of rooms. One with single occupancy and one with double occupancy.

A room in the male hostel or in the female hostel can be booked for any period from one day to 7 days. The male room rate is PKR 1000 per day, female single occupancy room rate is PKR 2000 per day and double occupancy room rate is PKR 1000 per day. The rent is on a per day basis and is charged in advance at the time of booking.

Each ***Accommodation*** type includes:

- Accommodation information (Location: Male Hostel/Female Hostel, Type: single occupancy/double occupancy, number of rooms).
- Total number of rooms currently occupied.
- Total number of delegates.
- List of rooms currently available
- List of rooms currently reserved along with the booking details
- Waiting list of up to five booking requests

The ***Booking/Reservation Info*** includes the following information:

- Date of booking
- Date of start of occupancy (cannot be other than the event dates 1st to 8th Jan)
- Date of end of occupancy (cannot be other than the event dates 1st to 8th Jan)
- Number of days booked (cannot be greater than 8 days)
- Type of booking (room in male hostel/female hostel, only one type is allowed at a time)
- Room Number (room number in male hostel, room number in female hostel)
- Type of Occupancy (single or double)
- Personal information of the person who made the booking (name, CNIC, phone)

You have two types of actors: **Delegates** and **LUMUN Administrator**, each with a specific set of operations.

In the part-1, you will implement just the **Delegates** operations which include:

- Query (availability of rooms)
- Reserve a room (room in male or female hostel)
- Checkout
- Cancel reservation

Query: **20 Marks**

When query option is chosen, the system shall prompt the ***Delegates*** to search by:

Hostel (male/female), or Accommodation type (single, double), The result is a list of available rooms.

Reserve: **30 Marks**

If accommodation is available, then the ***Delegate*** is able to enter the reservation information and move the room available to the reserved list. If accommodation is not available, then the reservation request is added to the waiting list provided there is space available in the waiting list. In case there is no space in the waiting list then the delegate is informed accordingly.
Note: Each room is fully occupied and cannot be reserved only if there are two delegates in it in case of double occupancy. Moreover, each room will be assigned in a sequential order.

Checkout: **20 Marks**

The Delegates perform the checkout process and print the detailed reservation report including total charges.

Cancel: **20 Marks**

The ***Delegates*** can cancel a given reservation by specifying the name entered at the time of booking. If there is a Delegate in the waiting list then that Delegate is moved to that room otherwise the room is cleared and returned back to the available list.

General Instructions:

You are free to use inheritance and polymorphism concepts according to your approach, however marks will be deducted if your final solution doesn't use concepts of inheritance and polymorphism.
Write a main function to test the program. The main function shall provide a two-level menu. First level is to choose between the Delegates and Administrative functions and the second level is the respective functions for the above actors. The program should only terminate when the user selects the **quit** option.

Correctly displaying menus of each option. **10 Marks**

First Level:

1. Room Reservation (Delegates Operations)
2. Administrative Operations
3. Quit

Second Level for Delegates:

1. Query 20
2. Reserve 30
3. Check out 20
4. Cancel reservation 20
5. Back to menu

Good luck and Happy Coding! 😇