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Faculty of Engineering   **Course Code: CC271 / CSE126**
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Final Project
Hotel Management Systems

Project Overview

The Hotel Management System is a software designed to streamline the operations of a hotel, focusing on room reservations, cancellations, customer details management, and billing. This system ensures efficiency and accuracy in managing hotel operations.

Functional Requirements

The system should provide the following functionalities:

1. Login

- Users (hotel staff) must log in with a username and password to access the system. Unless a valid username and password pair is entered, all system functionalities should remain inaccessible.
- User credentials will be stored in a text file named **"users.txt"**, each line representing a username and password pair.
- Example for "users.txt"
    - john.doe 12345
    - jane.smith.88 password123
    - ahmed.mohamed 123$@1

2. LOAD (READ FROM FILE):

- This command loads the **reserved** rooms' data from a file called **"Reservation.txt"** The file is comma-delimited, with each entry on a separate line.
- Each entry must contain the **Reservation_ID, Room number, Room Reservation Status (Reserved Confirmed, or Reservation Unconfirmed), Customer Name, Customer National ID, no. of nights, check-in date, customer email, and mobile number.** An example of data in the file is as follows:

```
143256,1124,confirmed,Ahmed Mohamed,90022800157646,4,29-12-2024,Ahmed.khaled@gmail.com,01227653498
143257,1125,unconfirmed,Mohamed Salah,90022800157647,3,01-01-2025,mohamed.salah@gmail.com,01227653499
```

3. Room Reservation

- Users can reserve a room by providing the following details:
  - Customer name.
  - Contact information such as Customer national ID, email, and mobile number.
  - Check-in date.
  - Number of nights.
  - Room Category (SeaView, LakeView, or GardenView).
- A non-duplicated Reservation ID will be generated **automatically** and the room number assigned will be attached to each reservation record according to the requested room category automatically also from the available rooms with the same category in "Room.txt". **The Reservation ID should be both unique and random.**
- The customer must know its Reservation ID to use it in the process of check-in, check-out or cancellation reservation.

4. Check-In:

- Facilitates guest check-ins by verifying reservation details and updating room status to "Reserved" in "Room.txt".
- During check-in, the system must update the reservation status from "UnConfirmed" to "Confirmed" in "Reservation.txt"
- It is important to note that check-in is not allowed before the check-in date specified in the reservation details.

5. CancelReservation:

- Users can cancel a reservation by providing the reservation ID or room number.
- You must delete the reservation record for this room from "Reservation.txt" and change the room status to available again in "Room.txt".
- The facility of reservation cancellation can not be done if the room reservation status is "Confirmed".
- A message will be displayed to confirm the cancellation.

6. Edit Reservation:

- The user should be prompted to provide a reservation ID or room number.
- The user can edit reservation details. The user should be prompted field by field to modify the information for that reservation.
- You can modify only the name, mobile, email address, reservation date, room category or number of nights only.

7. Tracking Rooms Availability

- The "Room.txt" file contains all the hotel room **numbers**, their **status**, room **category**, and **price** per night. An example of data in the file is as follows:
  - 1001 Available SeaView 2000
  - 1002 Available GardenView 1600
  - 1124 Reserved SeaView 2200
  - 1130 Available LakeView 1800
  - 1133 Reserved LakeView 1800

8. View Customer Details

- By using reservation id or room number, the system can view the customer information such as name and contact details.

9. Check-Out:

- The system should calculate and display the total bill during check-out by selecting the room based on its number. After that, the system must delete the reservation record from "Reservation.txt" and change the room status to "Available" in the "Room.txt" file.
- The check-out facility can only be applied to **confirmed** reservations.
- Check-out can occur at any time and is not restricted by the number of nights specified.

10. UpdateRoomStatus:

- The system must update the room status in the "room.txt" file, when a room is vacated, change the status from "Reserved" to "Available".

11. QUERY (SEARCH):

- The system should process a request by the user to look up the information about:
  - **By customer name** to retrieve their reservation details and the customer info.
  - **By room number** to view the current status and assigned guest information if reserved.
  - **By room status** to view all available or occupied rooms.

12. REPORT:

- The user should be prompted for a specific date, and then the function should print all the customers' details **checked in on that date**.

13. SAVE:

- Save the changed data by writing them out to the same file in a format similar to that explained in each file.
- Note: after each function that modifies the data you have to ask the user if he wants to save changes and confirm or discard the changes.

14. QUIT: Exit the program.

15. BONUS Features:

- Used a colorful user interface.
- Print Sorted:
  - Sort the reservation information in "Reservation.txt" by date.
- Libraries are collections of code that other programs can use. They promote code reuse and modularity. **[Separate your C code into header (.h) files and source (.c) files for better organization].**

Technical Implementation

- ## Data Storage
  - ### Use text files to store data:
    - users.txt for login credentials.
    - rooms.txt to track room availability.
    - Reservation.txt holds all reserved rooms' details.
- ## System Interface:
  ### The system will display a Login MENU with the following options:
    - Login
    - Exit
  ### After a successful login the following MENU will appears:
    - Reserve a Room
    - Check-in
    - Cancel Reservation
    - Check-out
    - Check Room Availability
    - View Customer Details
    - Edit Reservation Details
    - Query (search)
    - Reservation Report
    - Exit
  - Always ask the user to either go back to the menu or exit.
- ## Error Handling
    - Top Priority Your program **MUST NOT crash** under any circumstances, even against malicious users 🙂
    - Ensure all inputs are validated.
    - Room numbers must be valid and exist in rooms.txt.
    - Contact details should follow the correct format. (eg. phone numbers and emails).
    - Provide appropriate error messages for invalid operations.

Notes
  - Validate all inputs to prevent errors.
  - Ensure the system handles multiple users and concurrent reservations.
  - Maintain a clear and user-friendly interface for hotel staff.