



CCP4114 Program Design

Program Title: Room Booking Program

Group No: 12

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Chapter 1: Introduction

1.1 Overview

Our Room Booking System is a console-based application that offers room bookings for local and foreign customers, with administrative functionalities for managing room prices and viewing booking details.

After launching the program, users are required to select whether they are customers or admins. This step is specifically designed to protect the admin menu, where admins have access to modify hotel information and view customer booking details. As mentioned above, administrators have access to perform tasks such as editing room prices and displaying booking details by writing the updated information to the file to ensure pricing information is always updated as soon as possible.

Customers are guided through another elaborate process in our system to start their booking. They need to provide their personal information, such as their name, contacts, and more; then they need to choose their room type and specify the duration of their stay. The system can determine the total amount to be charged for the rooms and days booked, and there is also an option to add one or several bookings. After confirming the booking, all information will be stored in a file for later use, and the booking details will be displayed for customer viewing.

In a nutshell, there are several functions of the program, each according to the specifics of the booking and administrative services performed. These functions include reading and writing room prices, calculating total charges, inputting booking details, and displaying stored booking information. Structuring the program in this way helps to make it clear, easy to use, and easy to maintain.

1.2 Objectives

The objectives of this program are:

- Simplify the booking process for guests and staff.
- Optimize room utilization and revenue generation.
- Provide real-time availability and accurate information.
- Improve overall guest experience through streamlined operations.

1.3 Scope

The Room Booking System program allows users to book rooms and manage bookings efficiently. It includes roles for both Admins and Customers. Admins can view and update room prices stored and retrieved from a file and display booking details. Customers can enter personal details, choose a room type, and specify the duration of their stay. The system calculates and displays the total charge, supporting multiple bookings in one session. The program features input validation for role selection, admin password, and room type, providing a text-based console interface for structured navigation and interaction. When reading the file, we set the maximum line length that can be read as 100 lines in this program. Besides, the maximum number of bookings that can be made by a user is set to 100 bookings at one time.

1.4 Target User

The target users of this Room Booking System program are:

1. **Hotel Administrators:** Administrators are one of the primary users in the Room Booking System, as their work is to oversee system setup, manage users' roles and permissions, analyze and create reports, and monitor the system performance. It assists administrators in making effective decisions and efficient resource allocation on aspects concerning room inventories, price-making, and operational analytics. For instance, administrators can communicate with the system through a centralized dashboard which allows them to view and manage bookings in real-time, adjust pricing based on vacancy, employ various reports, and customize system settings to meet business needs. With the aid of the system and dashboard, administrators can make decisions effectively, allocate the rooms efficiently, and increase the levels of utilization and profitability of the hotel booking services.
2. **Hotel Customers:** Guests are allowed to make bookings through our room booking system using various channels, such as our website, mobile app, or directly with reception. Its main advantages include easy navigation that enables users to search through the list of rooms and see the availability of each in real time. After that, they can check the transparent price and proceed to secure bookings. This process also

allows customers to choose the package or room that best suits them. Upon booking, guests can receive instant confirmation, which is provided with their information, room information, and a clear price. In summary, our system provides customers with a platform to easily look for available rooms, choose dates, view rates, securely make payments, and receive payment confirmations, ensuring a convenient and efficient booking experience tailored to their preferences. Overall, our system is user-friendly for both local and foreign customers, as we offer online booking, which avoids face-to-face introductions and reduces language barriers. Additionally, our online room reservation system allows customers to reserve a room prior to arrival, which saves time and provides convenience to both customers and us.

3. **Hotel Staff:** Hotel employees include receptionists, reservation clerks, and managers, they work together to operate a hotel. Their work scope and responsibilities may be different, but what they have in common is that they all need to use the hotel management system to assist them in completing their work efficiently. Front office clerks utilize the room booking system to verify customer information and recommend packages that best suit customer needs to provide efficient guest registration services, while reservationists perform bookings in real time using the room booking system. At the same time, managers can use the system for supervision, making managerial decisions to enhance the effectiveness and satisfaction of guests. The most important is, staff can access the system through computer or mobile device to assist customers with bookings, streamlining customer interactions and improving operational efficiency.

This program is suitable for small to medium-sized hotels or guesthouses seeking an automated solution for managing room bookings and pricing.

Chapter 2: Program Features

In this Room Booking Program, we have implemented three key functions: administrators can edit room prices and display all booking records, while users can make room bookings using our system.

2.1 Edit Price

```
-----
                        Admin Menu
-----
What you want to do?
1. Edit Price
2. Display Booking Detail
3. Exit
-----
Select action (1,2 or 3):1
Current prices:
Single: 1000.00
Twin: 1500.00
Deluxe: 3000.00
Do you want to update the prices? (y/n): y
Enter new price for Single: 1200
Enter new price for Twin: 1700
Enter new price for Deluxe: 3200_
```

Figure 2.1.1 Screenshot of Edit Price Feature

Figure 2.1.1 shows the process of the edit price feature. The first function of the admin role is “Edit Price”. Once the user chooses their role as admin and enters the admin password, the admin will be redirected to the Admin Menu. After that, the admin can select option 1, the system will display the current price of every room type by retrieving from the price.txt file. The system will prompt the admin with a message “Do you want to update the prices? (y/n)”, admin can input the character “y” to enter the new price for each room type. The room price will be updated and saved in the price.txt file.

2.2 Display Booking Details

```
-----
                        Admin Menu
-----
What you want to do?
1. Edit Price
2. Display Booking Detail
3. Exit
-----
Select action (1,2 or 3):2
Booking Details:
-----
```

Type	Name	ID	Phone	Email	Booking Date	Room Type	Num Days	Total Charge
1	Aw Kak Yi	1234	01111111123	awkakyi@gmail.com	2024-05-19	Deluxe	3	4305.00

```
Press Enter to return to the menu...
```

Figure 2.2.1 Screenshot of the Display Booking Details Feature

Figure 2.2.1 illustrates the process of the display booking details feature. Besides editing the prices of the room type, the admin can also perform the display booking details action by choosing option 2. After the system receives the instruction, the system will read the bookingDetails.txt file and prompt the content of the file to the admin so that the admin can review all the booking records. At the end of the booking details display, the message "Press Enter to return to the menu..." will appear. Admins can simply press the Enter key to navigate back to the Admin Menu, ensuring seamless navigation throughout the system.

2.3 Make a Booking

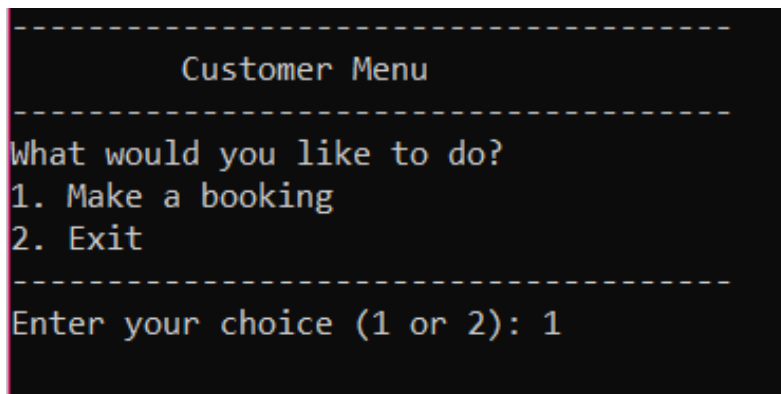


Figure 2.3.1 Screenshot of the Customer Menu

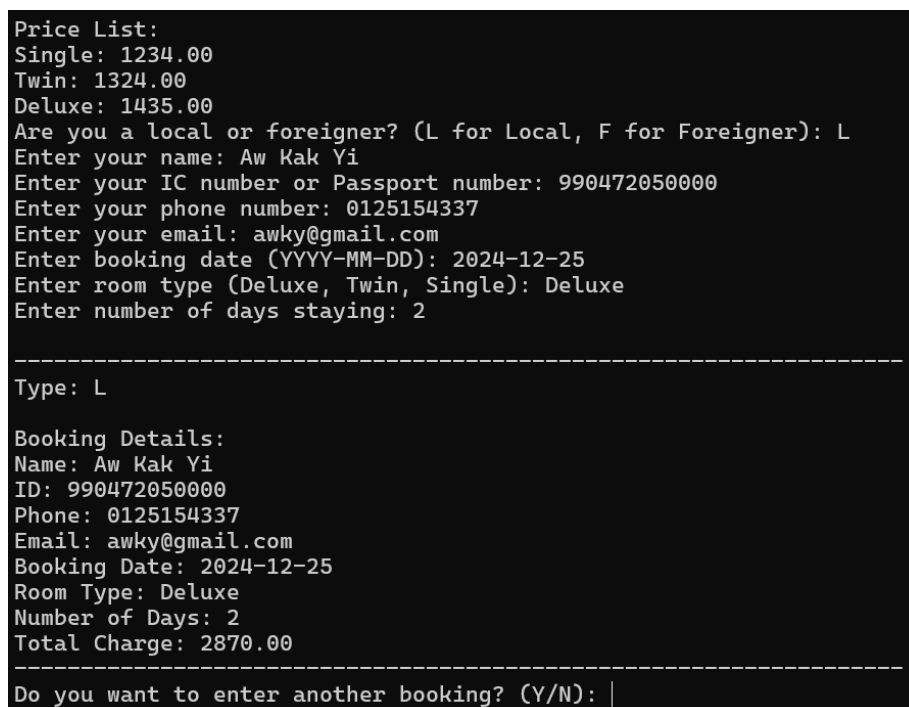


Figure 2.3.2 Screenshot of the Make Booking Feature

In this Room Booking System, customers can easily make bookings to reserve hotel rooms. First of all, when the user selects the customer role, a Customer Menu will be printed out (Figure 2.3.1). The customer can enter option 1 to make a booking or enter option 2 to exit the Customer Menu and go back to the main menu. If they choose option 1, the booking process will begin with printing the price list to the user, followed by asking the customer type, either local or foreigner, customer's name, IC number for local customer and passport for foreign customer, phone number, email, booking date, room type, and number of days staying. After entering all the details, the system will calculate the total charge based on the room type and number of days staying. Full booking details will be printed out to let the customer review before entering another booking. By entering the character "Y", the user will start over the booking process or enter the character "n" to get back to the customer menu. All booking records are stored in the bookingDetails.txt file, accessible to the admin for review and management.

Chapter 3: Lesson Implementation

3.1 Control Structure (Selection & Repetition)

Control structures in programming are constructs that allow for the logical flow and decision-making within a program. For example, based on what we have learned in this course, we use the condition statement (if-else) and different types of loops (do-while and while) to perform the input checking and determine which statements are going to be executed. For instance, in all the menu functions, we use a do-while loop to print out the menu and use the if statement to check if the user enters a valid input. If the input is invalid, an error message will prompt, displaying the menu again until valid input is provided, thereby ending the do-while loop. Moreover, in the function `customer_menu`, a switch statement is used to determine the flow and prompt error message in the else statement of the switch case.

3.2 Functions

By referencing the video of Jonathan (Jonathan McCarthy, 2021), we utilize the menu system in this program to ensure seamless navigation throughout the system. We have defined many functions that are invoked to regulate the execution of the entire program and to make the feasible feature separation outside of the main function. This approach improves legibility and modularity because it splits specific operations into little structures, simplifying the program's comprehension and alteration. In addition, we declared all the function prototypes to inform the compiler about the existence of functions before they are actually called or defined.

3.3 Array

An array is useful in storing and manipulating several occurrences of the booking records in the Room Booking System. In particular, the bookings array is used to save customers' names, their IDs, their contact phone numbers and emails, dates of booking, types of rooms, and the number of days the room will be used. This array is very relevant to the management and retrieval of booking details within the program effectively. Arrays guarantee that complex data is stored in sequences, making it easier to retrieve and/or manipulate the information relating to a particular booking at will.

3.4 Pointers

The pointers are used at different stages of the program especially while using dynamic memory management and file operations. For example, when reading prices from the price.txt file, pointers are used to store and modify the price of different room types (Single, Twin, Deluxe). Pointers have the advantage of efficient memory management since they let some functions to manage data without passing the whole data structures as values. They also enable operations like setting new prices according to user input, and using data to write back to files, such that changes are seen throughout a program.

3.5 Structures

In the program, there are structures (struct Booking) designed to handle and cater to all the aspects of booking information comprehensively. While implementing the Booking struct, there are several common fields such as the type of booking, name, identification number, contact number, email address, date of booking, room type, number of days, and total charge of the booking. These fields are defined by using suitable data types such as char arrays for strings, int for num_days, and float for total charge where some specific details for each booking are required.

3.6 File

Besides, file handling is quite crucial to storing data that is needful to the Room Booking System permanently like the room prices in the price.txt file and the details of the booking in the bookingDetails.txt file. The examples of functions readPrices, writePrices, writeBookingDetailsToFile and displayBookingDetailsFromFile highlight the use of file operation where text files are used; Such operations help to save important information that should be available across various instances of the program's run, allowing the administrators to control the prices of the rooms and study the records of bookings. File handling also maintains the records' accuracy and endurance, which the program needs to keep in its functions.

Chapter 4: Conclusion

The development of this program has laid down proper knowledge in conceptual programming. Data control structures like conditional statements and other loops were important for the flow of the program. Some functions allowed for processes to be broken up into modules, making them easier to read and modify. Arrays provided an ideal way of storing and managing data and points to make it easier to manage the memory space. Also, file handling made it possible to maintain the data by storing room prices and booking information permanently. This project gives a real-life implication of the concept of programming and, hence, will produce an efficient software product to manage the hotel.

References

Jonathan McCarthy. (2021, November 9). *Python Console Menu Example* [Video]. YouTube.
https://www.youtube.com/watch?v=_qHGNgJ1EcI