University of Sri Jayewardenepura

B.Sc. (General) Degree First Year
First Semester Terminal Course Unit Examination – June 2019

ICT 107 1.0 Computer Programming – Laboratory 1
(Time: 4 hours)

Answer all questions.

Instructions

- Answer all questions.
- Candidates may use lecture notes.
- Design and give a structured, user friendly program in C. It is not mandatory to write comments, but you have to use other good programming practices that you have learned in the class.
- Write your index number, as a comment, on the first line of your program.
- Please do not ask to explain the problem (not even a part of it). If you think something is unclear or ambiguous, make a reasonable assumption (One that does not contradict the question), write it on the first page of your answer sheet, and write the program under the assumptions you made.
- Create a new Code::Blocks project with the following information.
    - Project title: AS2018*ddd* (where *d*'s are the last three digits of your index no.),
    - Folder to create project in: Desktop
- At the end of the examination copy the folder named AS2018*ddd* on the desktop to exam-*nn* drive (where *nn* is the machine number). Make sure all the files are copied to the assign folder correctly before leave the examination hall.

Queens holiday resort is a newly established hotel in Hikkaduwa. Hotel offers two packages to their customers, such as "Spend the day" and "Stay the night". Hotel consists of 40 rooms. First 20 rooms (1 to 20) are double and the rest of the rooms are triple rooms (21 to 40).

The "spend the day" package is offered to a group of people with more than five members. It includes, welcome drink, lunch and evening coffee. It costs Rs.6000.00 per adult and Rs.3000.00 per kid. "Spend the day" customers can request pool and gym facility to their package. For pool and gym facility, customer should pay additional Rs.1500.00 per person except kids.

The "Stay the night" package allows customer to stay in the hotel. Customer can select either "Half Board" or "Full Board" option.

Write a C program to perform the following task. Write separate functions to process each menu option.

Main menu

Figure 1, shows the main menu screen of the program. First, user will select a package. According to the menu selection, user will direct to the relevant screen. When user enters the incorrect selection number, it will prompt an error message and ask to re-enter the selection number. The input screens of the "Spend the day" and " Stay the night" packages are shown in the Figure 2 and Figure 4 respectively. After completing the selected task, user will return to the main menu. The system will continue this process till user selects the "Exit" option.

```
----------Main Menu----------
1. Spend the day package.
2. Stay the night.
3. Exit.
Select an option from above list:
-------------------------------------
```

Figure 1: Main Menu Options

1. Spend the day package

When user selects "Spend the day" package, system will prompt to enter package details as shown in Figure 2. Once user enters the details, system will calculate the package amount and display as shown in Figure 3. Moreover, the main menu options will be displayed for further operations.

```
-----------  Spend the day package  ----------

Number of Adults:       5
Number of Kids:         2
Do you want to use pool/gym facility (1: yes, 2: no): 1
-----------------------------------------------
```

Figure 2: Sample Input Screen of the "Spend the Day" Package

```
---------------Spend the Day Package Bill-----------------

Package Details: 5 Adults, 2 Kids with pool/gym facility

Total Amount:43500.00

----------------------Main Menu----------------------------
1. Spend the day package.
2. Stay the night package.
3. Exit.
Select an option from above list:
-----------------------------------------------------------
```

Figure 3: Sample Output Screen of the "Spend the Day" Package

2. Stay the night

When user selects "Stay the night" package, system will prompt to enter package details as shown in Figure 4. "Stay the night" package menu consists of four options such as "Check In", "Calculate Bill", "Check Out" and "Check Availability".

The "Check In" function is used to reserve a room based on the required room type (Double or Triple). The "Calculate Bill" function, calculates the total due amount according to a customer request. The "Check Out" function is used to make rooms available, once a customer has left the hotel. The "Check Availability" function is used to print the available room numbers in the hotel.

The system uses 40 element array to keep track of availability of rooms. Initially all the rooms should be in available status.

```
----------Stay the Night Package--------
1  Check In.
2. Calculate Bill.
2. Check Out.
3. Check Availability.

Select an option from above list:
-----------------------------------------
```

Figure 4: Menu Options of the "Stay the Night" Package

I. Check In Process

When a customer wants to reserve a room, the operator enters room type (Double, Triple) using "Check In" input screen (Figure 5). Based on the room type, system searches the array which we used to keep track of availability of rooms in order to make a reservation. If the system finds an available room, make the reservation and display the confirmation message " `Room number 1 (Double room) is reserved`" (Figure 6). Otherwise print the message "`rooms are not available`". After completing the "Check In" process, system will return back to the main menu.

```
---------------- Check In Process -------------------------------
What is the room type you want to reserve (1: Double, 2: Triple):1
-----------------------------------------------------------------
```

Figure 5: Sample Input Screen of the "Check In" Process

```
----------------------- Check In Process -----------------------
Room number 1 (Double room)is reserved.
-------------------------Main Menu-------------------------------
1. Spend the day package.
2. Stay the night package.
3. Exit.
Select an option from above list:
-----------------------------------------------------------------
```

Figure 6: Sample Output Screen of the "Check In" Process

II. Calculate Bill Process

This function is used to calculate the total bill amount. When a customer wants to calculate the total bill, operator should enter the required details as shown in Figure 7. Required inputs are room type, number of nights and payment method.

Input codes for room type and payment method are shown in Table 1 and Table 2 respectively. After getting all inputs, system calculates the total amount based on room type and number of nights stayed in the hotel. Room charges per night are given in Table 3.

For credit card payments, the system provides special promotion discount for their total bill. Table 4 displays the special promotion discount rates for credit card payment customers.

After completing the calculation process, total amount will be printed and system will return back to the main menu as shown in Figure 8.

Room Type	Input code
Double room – Half Board	1
Double room – Full Board	2
Triple room – Half Board	3
Triple room – Full Board	4

Table 1: Input codes of the room type

Payment method	Input code
Cash	1
ABS bank credit card	2
Other credit card	3

Table 2: Input codes of the payment method

	Double	Triple
Full Board(FB)	50000/=	55000/=
Half Board(HB)	40000/=	45000/=

Table 3: Room Charges Per Night

Total bill amount	ABS bank credit card	Other credit card
<=50000	20%	15%
>50000	40%	35%

Table 4: Promotional Discount Rates for Credit Cards

```
----------------- Calculate Bill Process -------------------
Room Type: 1
Number of nights stayed in the hotel:  2
Payment method: 2
------------------------------------------------------------
```

Figure 7: Sample Input Screen of the "Calculate Bill" Process

```
------------------------- Calculate Bill Process -------------
Package Details:  Double room with Half Board for 2 Nights
Total amount: 48000.00
--------------------------Main Menu-----------------------------
1. Spend the day package.
2. Stay the night package.
3. Exit.
Select an option from above list:
------------------------------------------------------------
```

Figure 8: Sample Output Screen of the "Calculate Bill" Process

III. Check Out Process

When a customer leaves from the hotel, the operator executes the "Check Out" process, as shown in Figure 9 and makes room available to the others. After completing the "Check Out" process, system will return back to the main menu as shown in Figure 10.

```
-------------Check Out Process -----------
Enter the room number: 1
-----------------------------------------
```

Figure 9: Sample input Screen of the "Check Out" Process

```
---------------------- Check Out Process --------------------
Room 1 is released and now it is available for new customers.
-------------------------Main Menu-----------------------------
1. Spend the day package.
2. Stay the night package.
3. Exit.
Select an option from above list:
-----------------------------------------------------------
```

Figure 10: Sample Output Screen of the "Check Out" Process

IV. Check Availability.

The Operator uses this function to list the available room numbers in each type (Double or Triple). The system searches the array and finds the unreserved rooms and prints the available room numbers as shown in Figure 11. After completing the "Check Availability" process, system will return back to the main menu.

```
------------------ Available room list---------

Double Rooms: 1, 2, 5, 16
Triple Rooms: 24, 25, 36

-------------------------Main Menu----------------------
1. Spend the day package.
2. Stay the night package.
3. Exit.
Select an option from above list:
-----------------------------------------------------
```

Figure 11: Sample Output Screen of the "Check Availability" Process

******END******