ITCS 201 – Fundamental Programming

Project ICT-Restaurant

A mini restaurant for ICT students

Group work: 5 people/group

Released: Friday 5 October 2018

Due (Flowchart): Friday 26 October, 2018 11:55 PM, via MyCourse.

Due (Prototype): Friday 16 Nov, 2018 11:55 PM, via MyCourse.

- You can submit multiple times before the deadline. Your last submission will be marked.
- No late submission is allowed. You will get **ZERO** score if you submit late.
- Zip all your files and name it as ID_61880XX.zip

Demonstration: in the Last week lab (week 15) December, 2018

Learning Objectives

On the course of implementing this programming project, you will learn the basic concepts of C programming language and how to apply them to practical, real-world programming applications. Specifically, upon accomplishing this project, we expect you to be able to:

1. Translate business rules and ideas into code.
2. Identify possible solutions in form of flowchart to solve the problem
3. Learn how to use appropriate data types in the real-world problem.
3. Learn how to apply a condition and repetition statement in real-world problem.
4. Learn how to use Array to manipulate variables.
5. Get a glimpse of how to write C programming to solve real-world problems.
6. Enjoy coding with C language.

Introduction

ICT Restaurant is a system that enable the customer to book a table, order food & drink, and clear a bill. The requirements of the ICT Restaurant that you have to implement are as follows:

ICT-Restaurant Requirements

The system consisted of 5 functionalities as follow:

- Main Menu 3 marks
- Book a table 3 marks
- Order food and drink 3 marks
- Order more food and drink 3 marks
- Display and clear a bill 3 marks
- *Extra features (at least 3, if you want to get full marks) 3 marks

The score will be divided into two parts:
1) Flowchart of the system (need to be submitted first)
2) The prototype of the system. For the prototype of the system, the score will be given based on the test cases. The students have to demonstrate their projects to one of the instructor or the lab assistance for marking.

The description of each function is explained in the following section. Please carefully read and implement each function accordingly.

Instruction

Function 1: Main Menu

The main menu will appear immediately after starting the system. The customer can enter "1" to **book a table**, enter "2" to **order food & drink**, enter "3" to **display and clear a bill**, or enter "0" to **exit the system**. The screen should be similar as below.

```
============================================================
ICT Restaurant System
============================================================
[1] Book a table
[2] Order food & drink
[3] Display and clear a bill
[0] Exit
------------------------------------------------------------
Enter the choice:
```

Figure 1: Example of the main menu of the ICT Restaurant System.

Function 2: Book a Table

From the main menu, the customer can choose the option 1 (i.e., enter the character 1) on the main menu to book a table. Then, the customer will be asked to input "**number of people***"* to the system for booking a table. After that, the system will display a list of tables contain a table number, a seat number, and status information as shown in Figure 2.

```
[Book a table]

Enter the number of people: 2

============================================================
List of tables                              Status
============================================================
Table 1: 2 seats                            Available
Table 2: 2 seats                            Available
Table 3: 2 seats                            Available
Table 4: 2 seats                            Available
Table 5: 4 seats                            Available
Table 6: 4 seats                            Available
Table 7: 4 seats                            Available
Table 8: 4 seats                            Available
Table 9: 8 seats                            Available
Table 10: 8 seats                           Available

Enter a table number (input 0 to cancel):
```

Figure 2: Example of table booking function.

Note that each table's status depends on "number of people" that is inputted by the customer. For example, if the customer books a table for 4 people, "status" of tables that have seats less than to 4 will display the message "**Not enough seat**" while seats that have been booked before will display the message "**Occupied**" as presented in Figure 3. Having entered "number of people", the system will ask for "table number" that the customer want to book. If the status of the table is either "Not enough seat" or "Occupied", the system must ask the customer to re-input an available table. After the customer chooses the available table, the system will update the status of the table, and return to the main menu screen.

```
[Book a table]

Enter the number of people: 4

============================================================
List of tables                                Status
============================================================
Table 1: 2 seats                              Not enough seat
Table 2: 2 seats                              Occupied
Table 3: 2 seats                              Not enough seat
Table 4: 2 seats                              Not enough seat
Table 5: 4 seats                              Available
Table 6: 4 seats                              Occupied
Table 7: 4 seats                              Available
Table 8: 4 seats                              Available
Table 9: 8 seats                              Occupied
Table 10: 8 seats                             Available

Enter a table number (input 0 to cancel): 15
Invalid choice!
Enter a table number (input 0 to cancel): -1
Invalid choice!
Enter a table number (input 0 to cancel): 6
Please enter the available table.
Enter a table number (input 0 to cancel):
```

Figure 3: Example of booking a table that has already been occupied or invalid table numbers.

Function 3: Order food and drink

From the main menu, the customer may choose the option 2 (i.e., enter the character 2) on the main menu to order food and drink. Firstly, the system will display a list of occupied tables as shown in Figure 4. Then the customer will be asked to enter "the table number*"* for ordering. Next, the system will display the food menu and its price then the system will prompt the customer to enter the food number for ordering food. At this point, the customer can enter food number until they enter **0** (zero).

Next, the system will display the drink menu and its price. Again, the customer will be prompted to enter drink number until they enter 0 (zero). After that, the system will display the ordered food and drink with the amount of ordering. Then, it will display the message asking for confirmation of the order. If the customer enters 'y', the system will record the ordered food and drink and return

to the main menu screen. If the customer enters ‘n’, the system will return to the main menu screen without recording the ordered food and drink.

```
 [Order food & drink]

List of occupied tables:
Table 2
Table 6
Table 9

Enter the table number [1-10] (0 to exit): 2

============================================================
Order food & drink
============================================================

Food Menu                                       Price (Baht)
------------------------------------------------------------
[1] Kao Pad Kra Pao                             45.0
[2] Fried Rice                                  45.0
[3] Kha Nar Mhoo Krob                           50.0
[4] Tom Yum Koong Nam Khon                      60.0
------------------------------------------------------------
Enter the choice (input 0 to stop): 1
Enter the choice (input 0 to stop): 1
Enter the choice (input 0 to stop): 4
Enter the choice (input 0 to stop): 0

Drink Menu                                      Price (Baht)
------------------------------------------------------------
[1] Coca Cola                                   20.0
[2] Orange Juice                                30.0
[3] Still Water                                 10.0
------------------------------------------------------------
Enter the choice (input 0 to stop): 3
Enter the choice (input 0 to stop): 3
Enter the choice (input 0 to stop): 1
Enter the choice (input 0 to stop): 0

You have order the following:
[F] Kao Pad Kra Pao x2
[F] Tom Yum Koong Nam Khon x1
[D] Coca Cola x1
[D] Still Water x2
Confirm? (y|n):
```

Figure 4: Example of ordering food and drink.

Note that: when ordering food and drink, the customer can enter an invalid number or decide not to order food or drink. Hence, the system must be able to handle these situations. When the customer

input an invalid number, the system should display "**Invalid choice**" message on the screen and ask the customer to re-input the valid number on the menu as shown in Figure 5.

```
[Order food & drink]

List of occupied tables:
Table 2
Table 6
Table 9

Enter the table number [1-10] (0 to exit): 6

============================================================
Order food & drink
============================================================

Food Menu                                       Price (Baht)
------------------------------------------------------------
[1] Kao Pad Kra Pao                             45.0
[2] Fried Rice                                  45.0
[3] Kha Nar Mhoo Krob                           50.0
[4] Tom Yum Koong Nam Khon                      60.0
------------------------------------------------------------
Enter the choice (input 0 to stop): 1
Enter the choice (input 0 to stop): 2
Enter the choice (input 0 to stop): -1
Invalid choice!
Enter the choice (input 0 to stop): 5
Invalid choice!
Enter the choice (input 0 to stop): 4
Enter the choice (input 0 to stop): 0

Drink Menu                                      Price (Baht)
------------------------------------------------------------
[1] Coca Cola                                   20.0
[2] Orange Juice                                30.0
[3] Still Water                                 10.0
------------------------------------------------------------
Enter the choice (input 0 to stop): 0

You have order the following:
[F] Kao Pad Kra Pao x1
[F] Fried Rice x1
[F] Tom Yum Koong Nam Khon x1
Confirm? (y|n):
```

Figure 5: Example of ordering only food (i.e., no drinks) and inputting some invalid choices.

Function 4: Order more food and drink

The system must support the situation when the customer decides to order more food and drink later. This can be done by ordering food and drink again (via Function 3) with the **SAME** table number as the one that the customer previously ordered.

Function 5: Display and clear a bill

Having booked a table and ordered food, the customer may choose the option 3 (i.e., enter the character 3) on the main menu to display and clear a bill. Firstly, the system will display a list of occupied tables as shown in Figure 6. The customer then chooses at which table he/she was sitting to get a bill. After that, the system will display a list of food and drink with the corresponding prices as well as the total amount that the customer need to pay. The customer will prompt with the confirmation message asking whether the customer want to clear the bill or not. If the customer enters 'y', the system will remove the ordered food and drink from the table and then update the status of the table to be "**Available**". If the customer enters 'n', the system will return to the main menu screen without clearing the bill of the specified table.

```
[Display and clear a bill]

List of occupied tables:
Table 2
Table 6
Table 9

Enter the table number [1-10] (0 to exit): 2

You have order the following:

Food Menu                                Qty.   Price (Baht)
-------------------------------------------------------------
[1] Kao Pad Kra Pao                      2      90.0
[4] Tom Yum Koong Nam Khon               1      60.0
-------------------------------------------------------------

Drink Menu                               Qty.   Price (Baht)
-------------------------------------------------------------
[1] Coca Cola                            1      20.0
[3] Still Water                          2      20.0
-------------------------------------------------------------

** Total amount: 190.00

Do you want to clear the bill? (y|n):
```

Figure 6: Example of displaying and clearing a bill.

In the case that the customer has ordered only food or drink, the system will only display the list of ordered food or drink, respectively, as shown in Figure 7.

```
[Display and clear a bill]

List of occupied tables:
Table 2
Table 6
Table 9

Enter the table number [1-10] (0 to exit): 6

You have order the following:

Food Menu                                Qty.   Price (Baht)
-------------------------------------------------------------
[1] Kao Pad Kra Pao                      1      45.0
[2] Fried Rice                           1      45.0
[4] Tom Yum Koong Nam Khon               1      60.0
-------------------------------------------------------------


Drink Menu                               Qty.   Price (Baht)
-------------------------------------------------------------
None
-------------------------------------------------------------

** Total amount: 150.00

Do you want to clear the bill? (y|n):
```

Figure 7: Example of displaying and clearing a bill with no drinks.

In case that the customer has not booked table or enter number of table that is not on the list, the system will display the message "**There is no one sitting at the table. Press Enter to go back to the main menu**." as presented in Figure 8.

```
[Display and clear a bill]

List of occupied tables:
None

Enter the table number [1-10] (0 to exit): 9

There is no one sitting at the table.
Press Enter to go back to the main menu.
```

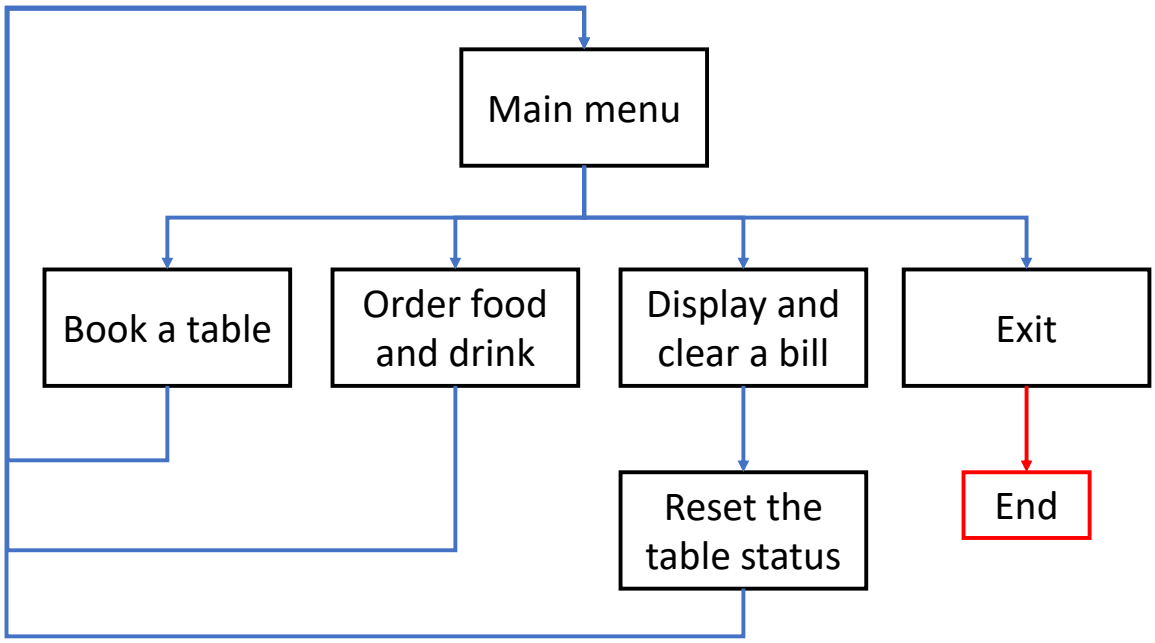
Figure 8: Example of displaying and clearing a bill of the table that has not been booked or table number that is not on the list.

In case that the customer has already booked table but have not ordered any food or drink yet, the system will display the message "**There is no any ordered food or drink. Press Enter to go back to the main menu.**" as presented in Figure 9.

```
[Display and clear a bill]

List of occupied tables:
Table 2
Table 6
Table 9

Enter the table number [1-10] (0 to exit): 9

There is no any ordered food or drink.
Press Enter to go back to the main menu.
```

Figure 9: Example of displaying and clearing a bill of the table that has not yet ordered any food or drink.

Application Diagram



Academic Integrity

Please do your own group work. Your survival in the subsequent courses heavily depends on the programming skills that you harvest in this course. Though students are allowed and encouraged to discuss ideas with others, the actual solutions must be written by themselves without ***being dictated or looking at others' code***. Collaboration in writing solutions with other group is not allowed, as it would be unfair to other students. It is better to submit a broken program that is a result of your own effort than taking somebody else's work for your own credit! Students who know how to obtain the solutions are encouraged to help others by guiding them and teaching them the core material needed to complete the project, rather than giving away the solutions. ***You can't keep helping your friends forever, so you would do them a favour by allowing them to be better problem solvers and life-long learners.* **

If you code is similar with the other group:

- **CASE 1**: More than 70% - 80%, both group will **automatically** get 50% deduction from full marks!!!.
- **CASE 2**: More than 80%, both group will automatically get ZERO.