MIDDLE EAST TECHNICAL UNIVERSITY, NORTHERN CYPRUS CAMPUS

CNG140 C Programming – Project 4

Date handed out: Wednesday 25 April 2012

Date submission due: Saturday 05 May 2012

Project Objectives

The main goal of this project is to help you exercise all three control constructs (sequence, selection and repetition). We are including some design constraints below section, so you will also use both kinds of functions (user-defined with pass by value parameters; user-defined with pass by reference parameters). This will give you experience decomposing a problem into parts, and then implementing each part in one highly cohesive, loosely coupled function. Make sure to employ the "principle of least privilege" when you are determining which parameter passing mode to use. Do not use pass by reference for a given parameter unless the function is supposed to return results to the calling program through that parameter. This helps limit "side effects" (unwanted changes to actual parameter values), and can make it much easier to debug your program!

Please remember good programming skills when you work on this project:

- Don't try to compile your entire program in one "big bang". Compile it piece by piece. Test each piece that you have compiled to make sure it works correctly before you add the next piece.
- Make sure your code follows "good software engineering principles" (e.g., good variable names, adequate comments, good visual layout to enhance readability, etc), as demonstrated in our previous sample codes in the class.

Restaurant Reservation System

The project is based on the design of a customer reservation system for a restaurant. You will write a program that allows the user to reserve a table in a restaurant, cancel a reservation or update the reservation. Your program will also allow the manager of the restaurant to see the overall reservation status.

The restaurant has two openings: One for lunchtime from 12:00 to 15:00 and one for dinner from 18:00-21:00. This restaurant is a very small restaurant and only has one of each of these tables: table that holds 3, 6, 12 and 15 people. Therefore, the total capacity of the restaurant is 36 people.

You will write a program that can be used by both customers to make a reservation and by the manager who can see the reservations made to the restaurant.

Your program will work as follows:

a) Write a function called `menu ()` that displays the following menu (in any reasonable format) of choices:

a. Make a reservation

b. Cancel a reservation

c. Update a reservation

d. Show reservations

q. Quit

- Your main program will call `menu()` function which returns the option user have chosen.

- This function needs to be able to give the user warning when they enter a character, which is not in the given list above. You do not need check all the possible cases for example if the user enters an integer value. Assume that the user is entering a character.

b) When user choices "Make a reservation" option, then your main function will call a function called `reserve()` that works as follows:

- Asks the customer to specify if their reservation is for lunch or for dinner, the number of people and the telephone number of the customer who makes the reservation.

- This function should take into account some limitations. Somebody can only reserve a table, for example if the customer wants to make a reservation for 13 people then they can only book the table for 15 people. If that table has already been booked, then your program should give an error message saying that there is no available table.

- This function should also take into account the total capacity of the restaurant, which is 36. If the customer wants to make a reservation for more than 36 people then your reserve function should give an error message saying that this is more than the total capacity of the restaurant.

c) When the user chooses "Cancel a reservation" than your main function will call `cancel()` function which works as follows:

- This function should get the telephone number of the customer and should cancel the reservation for that customer. Therefore, after the cancellation, the table reserved by that customer should be available for reservation.

d) When the user chooses "Update a reservation" than your main function will call `update()` function which works as follows:

- This function will work with a very strict policy. This function will first cancel the existing reservation of the user and then allow the customer to make another reservation.

- This function therefore will need to first display this policy to the user and then ask them if they accept this policy. If they accept this then this function will call first `cancel()` function to cancel the reservation and then it will call `reserve()` function to make another reservation.

e) If the user chooses "show reservations" than your main function will call `view()` function. This function will work as follows:

- We do not want all our customers to be able to use this functionality of our application. Therefore, when the user chooses this option your `view ()` function first needs to validate

the user. The user needs to enter a secret code and if that secret code is accepted then your `view()` function will show the tables reserved and the name of the customers who reserved these tables.

Requirements:

In your program you cannot use **global** variables. In your main function, you need to maintain the reservations for both lunch and dinner for all tables. You will then use pointers to pass these to other functions that need to use them.

Grading:

Your program will be graded as follows:

Grading Point	**Mark (100)**
Setting up main function	20
`Menu()` function that returns the chosen item (7 pts) - error checking on the items (3 pts)	10
`Reserve()` function (10 pts) - over capacity error checking (3 pts) - Display availability and success of the reservation status (7 pts)	20
`Cancel()` function (10 pts) - Finds the reservation of the given telephone number (7 pts) - Cancels the reservation (3 pts)	20
`Update()` function (10 pts) - Policy checking (3 pts) - Calling `cancel()` and `reserve()` (7 pts)	20
`View()` function (4 pts) - Secret code identification (2 pts) - Giving statistics (4 pts)	10