CS19001: Programming and Data Structures Laboratory

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Programming Assignments

Complete and submit during lab

Assignment 1 [PDS-Restaurant]

Write a main program to define an array of 50 structures named "order" to handle order processing in a PDS-restaurant. The structure has the following members.

- `char name[11]` : string of 10 character to store customer name.
- `int item[5]` :quantity of an item ordered by the customer (there are five items).

There also exists another array `itemRevenue[5]` storing 'revenue (profit) per item' per plate of all five available items. This is also a user input. Apart from that user also inputs another value (x), which represents 'minimum target average revenue (profit) for consecutive three orders' (the meaning and usage of this is explained in details later!).
In an infinite loop, look for any of the following user specified character choices/commands (a, b, c, d, e) and perform respective tasks as listed below. Exit if the user enters 'e'.

Assignment 1 [PDS-Restaurant]

- (Choice: a) `create-new-order`: This case should ask the name of the customer and the quantity of each of the five items. Insert the order at the end of the pending orders and print all the pending orders (customer name and items ordered and corresponding quantities) till now. Each order is to be given a sequentially increasing unique ID (denote by the index of the array of structures).
- (Choice: b) `delete-existing-order`: This case requests the user to specify an order by its ID or by the name of the customer (first ask to input for ID and if forgotten (-ve number is entered) then customer-name is asked). Here, you should display the existing order to be deleted and ask for confirmation. Upon confirmation (Y/N), delete the order and move the remaining orders forward in the structure-array.

Assignment 1 [PDS-Restaurant]

- (Choice: c) `serve-order`: In this case, you should display and delete the order that was placed the earliest and move the remaining orders forward in the structure-array. Immediately, it should also display all pending orders till now.
- (Choice: d) `display-item-statistics`: Display which item in what quantities are required to meet all the pending requests.
- (Choice: e) `terminate`: Exit from the infinite loop and terminate execution of the program.

Assignment 1 [PDS-Restaurant]

Justification of the value in x indicating 'minimum target average revenue (profit) for consecutive three orders':

- Consider the fact that PDS-restaurant owner may be greedy. He has a revenue (profit) model stating 'every three *consecutive* orders' in the pending orders gives an average revenue of at least x.
- Take x as user input.
- Implement this added `check-order` part inside `create-new-order` case (i.e. under Choice: a) which assumes that the owner's requirement holds for currently pending orders.
- A new order is accepted only if there may be a valid position in which a new-coming order can be inserted so that the revenue (profit) model is satisfied. Otherwise, the new order is rejected (not taken).

Assignment 1 [PDS-Restaurant]

- The *greedy owner* can insert a new order anywhere in the list in order to satisfy the revenue model !!!
- Example: Let the current pending orders be generating revenues of $(10.0, 8.25, 9.75, 5.0)$. Note that if $x = 7.5$, we have every three consecutive order giving an average revenue > 7.5 which is fine. Let a new order is paced where the revenue is computed as 5.5 for all the items ordered. Note $(10.0, 8.25, 9.75, 5.0, 5.5)$ do not satisfy the revenue model but $(10.0, 5.5, 8.25, 9.75, 5.0)$ does. Hence, the function will enter the order as the second element in the pending list!

NOTE: This `check-order` part may be implemented once user places new order from choice-a. It is recommended that, you first complete the assignment without this checking, and then add this part (separately)!

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Thank You