جامعة حلوان
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CS214: Data Structures

Sheet 4 (Car Workshop)

Write a C program that keeps track of the customers visiting a car workshop. The program utilizes two data structures, a stack and a queue to have customers' data in particular orders.

The main program should display the following menu:

1. Add a New Customer.
2. Serve a Customer.
3. Display Customers Information.
4. Display Customers information in the "most-recent" Order.
5. Exit menu

- By choosing "Add a New Customer" you should enter the data of the new arriving customer and save it such that he has the least priority among others.
- By choosing "Serve a Customer" you should display the data of the first arriving customer then dismiss them from the system.
- "Display Customers Information" prints on screen the data of the current waiting customers without serving them.
- "Display Customers in the most-recent Order" without serving them - should be done by copying the data to a structure that reverses the order.

Hints:

- Before coding the program first link the three files, **stack.c**, **queue.c**, and **main.c**; follow the following guide:

- Since the element type of the stack, queue, and the main program is the same, we need to be more structured by defining this common element type in a separate file **global.h**. In this file we should have all the definitions that are common to all of the three modules; these definitions are: the maximum stack or queue size, and the element_type, which will be the type of a customer and contains the following data: Name, ID.

- Now, **stack.c** must include **stack.h** and the latter includes **global.h**; why? Also, **queue.c** must include **queue.h** and the latter includes **global.h**. Finally**, main.c** includes all the three header files; why?

- However, this will cause a "redefinition error" since the definitions in **global.h** will appear again in the other two included header files because they also include **global.h**. To resolve this problem, we need to start **global.h** by:

```
#ifndef GLOBAL_H
#define GLOBAL_H
```

  then end it by ***#endif***

  These statements are "Preprocessor Commands" that are processed before compilation. For more explanation refer to your C language text book.