**The American University in Cairo**

**Computer Science & Engineering Department**

**Spring 2021 - CSCE 1101**

**Assignment 3**

**Notes:**

* **YOUR CLASSES SHOULD BE IMPLEMENTED IN SEPARATE CPP AND HEADER FILES. Failure to do so will result in loss of credit.**
* Answer each question on your compiler to make sure it is correct and free of errors. For each question, if any program is not compiling (has errors), you may lose marks.
* For each question, submit your source, cpp, and header files along with screenshot(s) of your program running with different samples
* Make sure your program is user friendly, use cout before cin so the user knows what should be entered.
* Make sure you compress all your work (.cpp files and screenshots) in a zipped folder with your name, your id, and the assignment number. For example: Name-ID-Assignment1
* Upload your zipped folder to Blackboard.
* The Assignments should be your own original work. Collaboration with other students or copying answers from online sources is prohibited by the AUC academic integrity code. Any violation of academic integrity will result in receiving a Zero in the assignment or failing the course.

**An owner of a restaurant chain asks you to extend the system you built in Assignment 2 with the below business requirements:  
“**Our chain of restaurants is so big, we have more than *30 branches in different countries*, each branch has different capacity (number of tables), address, and number of staff members. *A staff member can be a chef, waiter , delivery person (courier), or worker*. A chef cooks the orders, a waiter serves the order to the dine in customers, and a courier delivers the orders to delivery customers, while the worker takes care of cleaning and dishwashing. Each staff member has an id, branch name, and salary. A staff member should access the system to know their duties and update their progress (Ex. a waiter updates his/her progress at the end of the day by updating the number of orders delivered, while a worker updates the status of bathroom cleaning and number of washed dishes). *We have two types of customers; a dine in customer and a delivery customer, both customer types should be able to input their orders to your system.* Be aware of the important differences between dine in orders and delivery orders. While making orders, the dine in customer should be able to input the table number s/he wants to use. *That is whereas a delivery customer should be asked to input the address s/he wants to have the food delivered to.”*

**Below are some scenarios to help you imagine how the system will work:**

1. When a courier views his/her duties your system should print:  
   “A delivery person must do more than simply transport items from one place to another. In this job, you're a caretaker of others' food, and your company's money and name. To perform your duties safely, promptly, you need good driving skills, and navigation and organization skills”

Do the same for the Chef, waiter, and worker with suitable messages for their corresponding duties.

1. When a worker attempts to update his/her progress your system should ask about the number of dishes washed and whether or not the bathroom was cleaned and it should keep track of the answers given by the user.

Implement the same thing for the other staff members with different measures of progress depending on the job description of each staff member,

1. When a delivery customer places an order s/he is asked to input the order description and the address and time of delivery whereas a Dine in customer is asked to enter the branch name and the table number.

***Helpful tips:***

* Extend the classes you did in *Assignment Two* to add mainly but not limited to:
  + Branches
  + Worker
  + Address
  + Courier
* Implement inheritance relationship between classes Ex. Type of Customers
* Use the following code for inheritance relationship at DropBox:

**\Dropbox\CSCE110-Students-Spring '21\Helping Code- Books and Others\Assignment 3**

**Bonus:**

* Adding extra related classes
* Implementing an aggregation and composition relationship as described below:

[Association, Aggregation and Composition Relationships with Examples | Go4Expert](https://www.go4expert.com/articles/association-aggregation-composition-t17264/)

*You are required to use the concepts of inheritance, abstract classes, and polymorphism to build the previous system. your submission should include the following:*

1. An updated class diagram in UML showing all the classes, the attributes, the functions, and the related relationships.
2. The Cpp and header files of your classes.
3. The source file testing the functionality of your system.
4. Screenshots showing the restaurant owner how your code behaves in the three required scenarios for every class.