King Hussein School for Computing Sciences
Department of Computing Science

Object Oriented Programming Lab
Assignment #7

Instructor: Bushra Alhijawi Fall 2020/2021

Student Name	
Student Univ. ID	
Date	

	Q1 (60)	Q2 (40)
100%		
90%		
75%		
50%		
0%		

Total (100):_____

Grading Criteria

- **100%**: Program is fully correct, code is well-indented, identifiers are well-named and the output is well formatted.
- **90%**: Program is fully correct but meaningless identifier names are used, indentation is bad, or output is not well formatted.
- **75%**: Program runs mainly correctly. It fails to adhere to some of the specifications.
- **50%**: Program contains syntax errors but seems correct.
- **0%**: Program has serious syntax and/or logical errors.

Lab Objectives

- Practicing using composition.
- Separating interfaces from implementation.

Lab Instructions

- Create a new folder on desktop and name it by your "ID-FirstName-LastName-Lab1". Make sure to save your solutions in this folder.
- You must upload your solutions to e-learning as follows:
  - **Each project** you create it as a .zip file.
  - A **text file** associated with each project contains a copy of the code.

Lab Exercises

This assignment consists of two exercises. You should submit your code in **five files** on the e-learning: one header file (.h) for two classes, three CPP source files (.cpp) for classes implementation and the main function. Also, in your header file, you must prevent multiple file inclusion. Your code should use separate implementation of the class.

Exercise 1 – Author and Book Class

Exercise Objectives

- ✓ Define class
- ✓ Using constructor and destructor

Problem Description

You are asked to implement four files in this exercise: Author.h, Author.cpp, Book.h, and Book.cpp.

- A class called Author (as shown in the class diagram) is designed to model a book's author. It contains:
  - Three private variables: name (String), email (String), and gender (char of either 'm' or 'f').
  - Two constructor. The default constructor does nothing and the parameterize constructor to initialize the name, email and gender with the given values.
  - Three getters that returns the author's info.

Author
- name:String - email:String - gender:char
+ Author() + Author(string, string, char) + getName():String + getEmail():String + getGender():char

- A class called Book is designed (as shown in the class diagram) to model a book written by one author. It contains:
  - Four private instance variables: title (String), author (of the class Author you have just created, assume that a book has one and only one author), price (double), and qty (int).
  - Two constructors to initialize the title, author, price and quantity with the given values. Note that the second constructor is a copy constructor.
  - Four getter functions: getName(), getAuthor(), getPrice(), and getQty().
  - Two setter functions: setPrice() and setQty().
  - A function called **updateQty** that receives an int value (Purchased quantity (Pq)) and subtract the **Pq** from **qty** if the **Pq** <= **qty**. Otherwise, print "Quantity Exceeded". This function returns the quantity.

Book
- title:String - author:Author - price:double - qty:int=0
+ Book(t:String,a:Author) + Book (const Book &B, t:String) + getTitle():String + getAuthor:Author + getPrice():double + getQty():int + setPrice(p:double):void + setQty(q:int):void + updateQty(Pq:int):int

Exercise 2 – Use Author and Book Class

Exercise Objectives

- ✓ Declare objects
- ✓ Use constructor

Problem Description

Write the **main** function that uses **Author** and **Book** classes as follows:

- Declare an Author object, **Author1**. Initialize **Author1** with name=" Paul Barry", email="paul. barry@gmail.com", and gender='m'.
- Declare a book object, **Book1**, Initialize **Book1** with title="Head First Python" and author= **Author1**.
- Set the price and quantity of **Book1** to 39.99$ and 10.
- Declare a book object, **Book2**, Initialize **Book2** with the data of **Book1** and a title="Head First Python: A Brain-Friendly Guide".
- Set the price and quantity of **Book2** to 29.99$ and 7.
- Ask the user if he/she would buy any of the available books. See the example below.
  - If the user selects to buy any of the books, ask user about the required quantity.
    - Print the price of the selected book and ask the user to confirm the operation.
    - Update the available quantity of the purchased book.
  - Otherwise print "Thanks for visiting our bookshop".

Sample Output 1

```
Which book you would like to buy?
1) "Head First Python" for Paul Barry
2) "Head First Python: A Brain-Friendly Guide" for Paul Barry
3) I would not.
**********
2
The price of "Head First Python: A Brain-Friendly Guide" is 29.99$, press Y to confirm the order or N to cancel it
Y
**********
How many books you would like to buy?
3
**********
Done, 7 books still available.
Thanks for visiting our bookshop
```