Object Oriented Programming Lab

Lab 02 **Marks 20**

Instructions

- Work in this lab individually.
- You can use your books, notes, handouts etc. but you are not allowed to borrow anything from your peer student.
- Make sure to follow the best coding practices.
- Include comments to explain the logic where necessary.
- *You are strictly **NOT ALLOWED** to include any additional data-members/functions/constructors in your class.*
- Test your program thoroughly with various inputs to ensure proper functionality and error handling.
- Show your work to the instructor before leaving the lab to get some or full credit.

ADT: Ball

Write a class named **Ball** that has the following:

1. The Ball class should have the following four private data members:

- An integer named id that holds the ball's number.
- A string named name that holds the ball's brand name.
- An integer named quantity for holding the quantity of the balls on hand.
- A float named price for holding the wholesale per-unit price of the ball.

Values should only be assigned to data members **id**, **quantity**, and **price** if, they are positive; 0 otherwise.

2. Provide the implementation of the following constructors and a destructor.

- A constructor that accepts the ball's **id**, **name**, **quantity,** and **price** as arguments. These values should be assigned to the object's appropriate member variables.
- A constructor that accepts the ball's **id**, **name,** and **quantity** as arguments. These values should be assigned to the object's appropriate member variables. The **price** should be assigned the default value.
- A constructor that accepts the ball's **id**, **name,** and **price** as arguments. These values should be assigned to the object's appropriate member variables. The **quantity** should be assigned the default value.
- A copy constructor that initializes a ball's object with an already existing object.
- A destructor that does nothing except displaying a simple message "Destructor executed…" on the screen.

3. Provide the implementation of mutators for all the data members (**id**, **name**, **quantity**, and **price**) of the class.

4. Provide the implementation of accessors for all the data members (**id**, **name**, **quantity**, and **price**) of the class.

5. Provide the implementation of the following member functions.

- **setBall** method accepts ball **id**, **name**, **quantity,** and **price** as arguments and assigns them to the appropriate member variables.
- **getBall** method to initialize the data of a ball taken from the user through the console.
- **putBall** method to display the information of a particular ball on the console.
- **getTotalPrice** method should provide the facility to calculate and return the total price of a ball only if the quantity is greater than or equal to 1, return 0 otherwise.
- **isSame** method should provide the facility to compare two objects and return *true* if they are having same state, *false* otherwise.
- **updateName** method should accept an array of Ball objects with its size and update the ball name of all those objects to the ball **name** of left-hand side object exist in the array having same ball **id** number as of left-hand side object.
- **getMaximumPriceBall** method should accept an array of Ball objects with its size and return the ball having the maximum price in the array.
- **getAveragePrice** method should accept an array of Ball objects with its size and store the average price of all the objects having price less than or equal to 50 exist in the array to left-hand side object's price.

6. In the **main** function, create instances of the **Ball** class and demonstrate the functionality of each function clearly.