CS217 - Object Oriented Programming

Assignment 3

Note: You have to write the code by hand on a piece of paper. Kindly pay attention to the proper indentation of the code. You also need to run the code you have written and attach the screenshot with your handwritten assignment.

Question 1. Some of the characteristics of a book are the title, author(s), publisher, ISBN, price, and year of publication.

a. Define a class bookType that defines the book with the following data members and methods:

i. Each object of the class bookType can hold the following information about a book: title, up to four authors, publisher, ISBN, price, and number of copies in stock. To keep track of the number of authors, add another member variable.

ii. Include the member functions to perform the various operations on objects of type bookType. For example, the usual operations that can be performed on the title are to show the title, set the title, and check whether a title is the same as the actual title of the book. Similarly, the typical operations that can be performed on the number of copies in stock are to show the number of copies in stock, set the number of copies in stock, update the number of copies in stock, and return the number of copies in stock. Add similar operations for the publisher, ISBN, book price, and authors. Add the appropriate constructors and a destructor (if one is needed).

b. Write the definitions of the member functions of the class bookType outside the class.

c. Write a program that uses the class bookType and tests various operations on the objects of the class bookType. Declare an array of 100 components of type bookType. Some of the operations that you should perform are to search for a book by its title, search by ISBN, and update the number of copies of a book.

Question 2: Design a class memberType.

a. Each object of memberType can hold the name of a person, member ID, number of books bought, and amount spent.

b. Include the member functions to perform the various operations on the objects of memberType—for example, modify, set, and show a person's name. Similarly, update, modify, and show the number of books bought and the amount spent.

c. Add the appropriate constructors.

d. Write the definitions of the member functions of memberType outside the class.

e. Write a program to test various operations of your class memberType.

Question 3: Using the classes designed in Questions 1 and 2, write a program to simulate a bookstore. The bookstore has two types of customers: those who are members of the bookstore and those who buy books from the bookstore only occasionally. Each member has to pay a $10 yearly membership fee and receives a 5% discount on each book purchased. For each member, the bookstore keeps track of the number of books purchased and the total amount spent. For every eleventh book that a member buys, the bookstore takes the average of the total amount of the last 10 books purchased, applies this amount as a discount, and then resets the total amount spent to 0.

Write a program that can process up to 1000 book titles and 500 members. Your program should contain a menu that gives the user different choices to effectively run the program; in other words, your program should be user driven.