COLORADO MESA UNIVERSITY

CSCI 112 Data Structure Assignment 1 Due Sep 7, 2022

August 24, 2022

1 Part 1

1. Some of the characteristics of a book are the title, author(s), publisher, ISBN, price, and year of publication. Design a class bookType that defines the book as an ADT.
   (a) 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.
   (b) 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).
2. Write the definitions of the member functions of the class "bookType".
3. 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.

2 Part 2

Now design a class "memberType"

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

2. 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.
3. Add the appropriate constructors.
4. Write the definitions of the member functions of "memberType".
5. Write a program to test various operations of your class "memberType".

3 Part 3

Using the classes designed in sections 1 and 2 now design a program to simulate a bookstore. The bookstore has two types of customers:

1. those who are members of the bookstore and
2. 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 1,000 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.

I am providing you with a datafile containing example inventory - "bookData.txt".