Grade 12 Assignment #7 Java Programming

The Library (Personal Inventory)

In this project, you will create a simple Library tool to help analyze completed books in a small, personal library. The tool will print out the books that a user has fully read. We will store the books and their completion status in a HashMap.

Upon completion, feel free to explore and add additional functionality to the Library.

Tasks:

There are 23 Tasks to complete for this assignment:

1. Open the BlueJ IDE editor to create the code needed for the program called The Library (Personal Inventory).

2. First set up the BlueJ IDE. Create a project (file) with a public class called Library.

3. Import the HashMap (function) class. To use the HashMap function, it must first be imported. The HashMap class is part of a Java package. All imported

functions must occur at the top of the program before the public class declaration. Import the correct package by typing:

import java.util.HashMap;

Note: Java provides built-in classes (pre-defined functions that can be used). Some are readily available (like the System.out.println() and math operators +-&≤÷=) but that does not mean they are ALL readily available in ALL Java programs. Many classes are stored in Libraries called Java packages. The correct Java package must first be imported into a Java program before a certain class (function) can be used.

4. Next, create a class called Library, under the import declarations

5. Now create a Library constructor. You can leave the contents of the constructor empty.

6. Let's create a method that will print all of a user's completed books. Create a method called getFinishedBooks. It should not return any value.

7. The getFinishedBooks method should accept a HashMap parameter that holds strings and Boolean values. Name the parameter library.

   Hint: the parameter is written as:

   HashMap<String, Boolean> library.

8. The first thing the method should do is check to see that the HashMap it's analyzing is not empty. Create an if statement that checks if the size of library is less than 1.

9. Inside of the if block, print out a friendly error message to the user indicating that the HashMap is empty.

10. Otherwise, in an else block, print out all finished books. First, create a for each loop that iterates through each book in the key set of library.

11. Inside of the for each block, first check the completion status of each book. Create an if statement that checks to see if the value associated with each book in library is equal to true.

12. Inside of the if statement, print out the book. This completes the getFinishedBooks method.

13. Let's test out the functionality we just built. First, create a main method.

    The main method is the main body of programming code that is executed when run. Note: the main method must be defined *exactly the same way* every time it is created. Refer back to the lesson if you need to review the main method.

    In this assignment, the main part of the code is extremely simple. It will focus on creating an hash map then adding elements to that map. Then creating an object that belongs to the class through the class constructor. Once an object is created, that object can call the methods (specialized functions) that belong to the class. The main part of the code will simply call the main method and print out the results to the screen.

14. Next, create a HashMap object that stores strings and Boolean values. Call the HashMap object myBooks.

15. Add the following books and their completion status:

- Road Down The Funnel, true
- Rat: A Biology, false
- TimeIn, true
- 3D Food Printing, false

16. Now create a Library object called myLibrary.

17. On the next line, call the getFinishedBooks method on myLibrary and specify myBooks as the argument (parameter).

    If you completed this project correctly, the output should only print out the books that have a completion status of true, which are: Road Down The Funnel & TimeIn.

    Feel free to explore more with the program. What are some ways in which the program could be improved?

    For example, write an additional method that prints out the incomplete books.

    Also, as the program is right now there are no enough printed out statements to the screen (System.out.println()). As is the user only sees an the book titles and has no idea what is going on. This is not acceptable.

18. It would be helpful to describe to other developers what this small Java program does. Write some comments that describes what this program does.

a. Use multi-line comments to (/* comment in the middle of */):
    i. Write one at the top of the code (before the public class and import designations) that gives a quick intro/description the assignment.
    ii. Write one at the top of the code (before the public static void main(String[] args)) that summarizes the program.
b. Use a single line comment to (//then comment):
    i. Create 3 comments anywhere you deem necessary or important in the code. Remember the comment is to highlight or explain what is going on or what is being done in a particular way or used and why.
    ii. Identify the end of each part of the if-else statement and loops used. Make sure to indicate what that block of code does.
    iii. Identify the last line of code (anything that ends with a curly bracket }) in every function by writing "End of BLAH-BLAH function".
    iv. Identify the end of the program.

19. Once your program is complete, make sure to test it using the BlueJ IDE (do not submit a program that does not work).

20. Lastly, upload (drag and drop) your assignment to the portal. Look for your name under the Assignment 7 webpage.