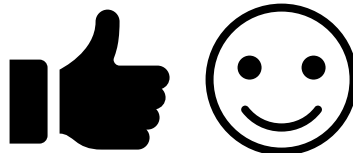


## **READ THE FOLLOWING INSTRUCTION** **BEFORE GOING TO THE QUESTIONS**

- The time limit is 2 hours.
- The exam is out of 50 marks.
- Before starting this exam, make sure that you download, complete and sign the SignaturePage file, and include it with your submitted files to Blackboard.
- For every question:
  - You should download its corresponding Java tester program.
  - Open the program in an IDE
  - Create the requested Java file.
  - **THOROUGHLY AND CAREFULLY READ THE DESCRIPTION OF THE QUESTION.**
  - Develop the java class
  - Compile your java file. Then using the corresponding tester class provided, test your development of the java class. Compare the output of your program with the one provided. If it is not similar to it, go back and fix your code.
  - After making sure about the correctness of your code, in terms of compile-time, run-time fatal, and non-fatal run-time errors, include the Java file into your final submission.

- **FOR ANY QUESTION, IF YOUR JAVA FILE HAS COMPILE-ERRORS, YOU WILL LOSE HALF OF THE ORIGINAL MARK. THEN, YOUR CODE WILL BE CHECKED LOGICALLY.**
- **DO NOT USE ANY NON-STANDARD LIBRARY.**
- **DO NOT CHANGE THE NAMES OF THE JAVA FILES ASKED FOR.**
- **DO NOT ALTER THE TESTER CLASS FILE.**
- **When you are done, SUBMIT the two Java files, INDIVIDUALLY, on Blackboard for your submission, along with the completed Signature Page file.**
- **DO NOT CREATE ZIP FILES. ONLY SUBMIT TWO JAVA FILES.**
- **DO NOT SUBMIT COMPILED FILES FOR ANY QUESTIONS. OTHERWISE, YOU WILL RECEIVE ZERO FOR THAT QUESTION.**
- **YOU SHOULD SUBMIT YOUR FILES BEFORE THE DEADLINE.**

**GOOD LUCK!**



### Question 1 (30 marks)

In this question, your task is to design a Java class, called Book, with the following requirements:

- Every book has ISBN, called isbn, with the type of String.
- Every book has a title, called title, with the type of String.
- Every book has a list of authors, called authors, with the type of ArrayList of String.
- Every book has an edition number, called edition, with the type of integer.
- Every book has a number of pages, called pages, with the type of integer.
- Every book has a price, called price, with the type of double.
- Provide the default **constructor** for the class, which only initializes the list of the authors with an empty ArrayList, and also initializes the title of the book with “No Title Yet”.
- Provide a second **constructor** for the class that initializes the isbn, title and edition with three corresponding parameters, as well as the empty ArrayList of the authors.
- For every property, isbn, title, edition, pages, and price, create public getter (accessor) and setter (mutator) methods.
- Create a public method, addAuthor, to add one author to a book.
- Create a public method, removeAuthor, to remove one author from the list of authors of a book. This method should receive the name of an author to remove it from the list of the current authors, if any.
- Create a public method, changeAuthor, to change one author in the list of authors of a book. This method should receive two parameters, the name of one current author, and the new name. To find the index of an object inside an ArrayList, you can call the indexOf method, which has the object as its parameter. If the object does not exist in the list, the method returns -1.
- Override the toString method to represent a book, with its isbn, title, list of authors, edition number, number of pages, and price.

When you completely develop the Book class using the above description and compile it to make sure that it has no compile-time errors, test it by running the BookTester class provided to you as a separate Java file.

The expected output of the BookTester class should be similar to the following output:

List of my books

-----

Title: War and Peace

Edition: 0

ISBN: null

Authors: Tolstoy

Pages: 250

Price: 99.85

-----

Title: The Hunchback

Edition: 2

ISBN: 1239812482912

Authors: Victor Hugo

Pages: 0

Price: 120.0

-----

Title: Mind and Cosmos

Edition: 1

ISBN: 2923981728291

Authors

Pages: 0

Price: 0.0

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Title: Another Book

Edition: 1

ISBN: 2923981728291

Authors: Bernard, Kyle

Pages: 0

Price: 0.0

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**You should submit the file `Book.java` as the answer to this question, in your submission.**

## **Question 2 (20 marks)**

In this question, your task is to design a Java class, called TextBook, with the following requirements:

- TextBook is a subclass of Book that you have created in the previous question.
- Every textbook has a subject, in addition to its title, with the type of String.
- Every textbook can have an electronic version as well. For this purpose, define a boolean field to indicate if the textbook has an electronic version or not.
- Every textbook should be able to keep the price for its electronic version as well.
- Provide a default constructor for the class that only initializes subject with “No Subject”.
- Provide a second constructor for the class that initializes the isbn, title, edition, and subject, with four corresponding parameters. **Note that for this constructor, you should first call the corresponding constructor of its superclass.**
- Create public setter (mutator) and getter (accessor) methods for the new properties of this class.
- Create a public method to add “ (TextBook)” to the end of the book title.
- Override the toString method to represent a textbook, with all its properties, including subject, and price of its electronic version, if any. **Note that in this method, you should use its corresponding method from its superclass.**

When you completely develop the TextBook class using the above description and compile it to make sure that it has no compile-time errors, test it by running the TextBookTester class provided to you as a separate Java file.

The expected output of the TextBookTester class should be similar to the following output:

List of my textbooks

-----

Title: Big Java (TextBook)

Edition: 5

ISBN: 3295016510492

Authors: Horstmann

Pages: 983

Price: 85.0

Subject: Computer Science

eBook: Yes

ePrice: 50.0

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Title: The Hunchback

Edition: 2

ISBN: 1239812482912

Authors: Victor Hugo

Pages: 0

Price: 120.0

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**You should submit the file `TextBook.java` as the answer to this question, in your submission.**