Instructions

1. You have 1 hour and 40 minutes to complete this test. The test will start at 09:40 and will finish at 11:20. This allows 10 minutes to read the test at the start, and 10 minutes to submit the test at the end.

2. Your programs should have your name and group in the comment at the top.

3. Comment and test your programs fully.

4. When you have finished working on the programs, upload them to Blackboard via the link at Content > CA1 Submission. **Make sure you upload three .java files.**

5. Your files must be submitted by 11:30. Attempts submitted after this time will be marked late. If you are registered with The Curve and entitled to extra time in exams you should submit by 11:50.

Question 1

Write a Java program that will read in a sentence from the user. The program will then use appropriate String methods to display the following:

- The number of letters in the sentence
- The sentence in uppercase letters
- The sentence in lowercase letters
- The number of words in the sentence
- The words of the sentence in reverse
- The first word of the sentence
- The last word of the sentence
- The first and last words in dictionary order

Sample Output:

```
Please enter a sentence: It was a beautiful sunny day
Your sentence has 28 letters
Your sentence in uppercase: IT WAS A BEAUTIFUL SUNNY DAY
Your sentence in lowercase: it was a beautiful sunny day
Your sentence has 6 words
Your sentence in reverse is day sunny beautiful a was It
The first word in your sentence is It
The last word in your sentence is day
day comes before It in dictionary order
```

(50 Marks)

Question 2

Download the files Book.java and BookTester.java from the CA2 Folder in Blackboard. You will add code to these files for this question. This Book class already contains the instance variables and the constructor, and the Tester class already contains a line of code to instantiate a Book object.

The Book class is represented in the following UML class diagram:

Book
author : String title : String year : int price : double
Book (String, String, int) getAuthor( ): String getTitle( ): String getYear( ): int getPrice( ): double setPrice(double) : void calculateHardbackPrice( ): double getBookDetails( ) : String

- The hardback price of a book is 20% more expensive than the normal price. The `calculateHardbackPrice( )` method should calculate and return this price. Do not store the hardback price as an instance variable.

- The `getBookDetails( )` method should return a String containing the author's last name, the year and the title. For example, if the book was Moby Dick by Herman Melville, published in 1851, the method should return **Melville (1851), Moby Dick**.

1. Implement the Book class as per this UML diagram

2. Write a tester class which calls all the methods defined in the Book class.

(50 Marks)