King Saud University
College of Computer & Information Science
CSC111 – Assignment 8
All Sections

Instructions

1- You must submit your solution using Web-CAT grading system. Web-CAT can be accessed from eclipse using the following IP address (single line):

```
http://10.131.240.28:8080/Web-CAT/WebObjects/Web-CAT.woa/wa/assignments/eclipse
```

2- Due date: Sunday Nov 8th at 11:59pm

3- You can discuss answers with your colleagues but **cheating is prohibited and there will be extreme consequences**.

Question 1

Design a class named **Book** to represent a book. The class contains:

- An **int** data field named **ISBN** that holds ISBN number. Each ISBN is 4-digit integer that represents the International Standard Book Number.
- A String data field named **author** that holds author name (assume each book has a single author).
- A String data field named **title** that holds book's title.
- A String data field named **genre** that holds book's genre (type of book).
- A method named **generateReference()** that returns a *String* formed by taking the first two characters of the author name and

the first two characters of the book genre and separates them with a dash.

Example: author = Doyle, genre = Novels → reference code = DO-NO

Hint: Use method **charAt(i)** of class String to get a character at a certain index i in a String (index starts from 0). For Example: if value of a String variable **s** is "abc" then **s.charAt(2)** will return 'c'.

- A method named **verifyISBN(int ISBN).** Given an ISBN, it returns true if the entered ISBN is correct and false otherwise. The ISBN is a 4 digit integer where the fourth digit is the *control digit* that checks if the ISBN is correct.

How to verify an ISBN?
Given ISBN = $n_1n_2n_3n_4$ the formula for checking correctness is as follows:

$$(n_1 \times 3 + n_2 \times 2 + n_3 \times 1) \bmod 4 = n_4$$

In other words: the result of this formula must be equal to the *control digit*.

Example: ISBN = 0200 is correct, while 1234 is not correct (use the formula and check!)

Hint: to get each single digit in a number, use similar idea to the one used in assignment 6, question 2.

- A method named **toString()** that returns a string description for the book. It uses the following format: (See the sample runs for an example)

```
Title:  <title>

Author: <author>

ISBN: <ISBN>  - Reference  Code : <referenceCode>

Genre: <genre>
```

Draw the UML diagram for the class and then implement the class. Write a test class **TestBook** with method **main** that does the following:

- Creates an object of type **Book**.
- Reads all data of the object from the user.
- Verifies the ISBN. If the ISBN is no valid print "Invalid ISBN" otherwise if the ISBN is valid it:
    - Displays the object by invoking its **toString()** method and printing the returned string.
    - Displays the book's reference by invoking its **generateReference()**method and printing the returned string.

Sample Run 1:

```
Please, enter the book details #ISBN, author, title, and genre.
0200
ali
thermodynamics
academic
Title: thermodynamics

Author: ali

ISBN: 200 - Reference Code: al-ac

Genre: academic

The book reference is:al-ac
```

Sample Run 2:

```
Please, enter the book details #ISBN, author, title, and genre.
1234
saleh
aladdin
adventure
Invalid ISBN
```