IIP

Test Unit 5

Year 2012-2013

Name:

1. Implement a datatype class `Subject` that implements a university degree subject. You must develope:

   a) Attributes for code (integer), name (string), short name (string), credits (real), and semester (char).
   b) A constructor that receives code, name, and credits; default short name is the empty string; default semester is 'X'.
   c) A constructor that receives the data necessary for initing all the attributes.
   d) The `get` and `set` methods for each attribute.
   e) An `equals` method that overrides the functionality of the method of the `Object` class; you must only check the value of the code of the subjects.
   f) A `toString` method that returns the string in format: "Subject NAME of CREDITS credits in semester SEMESTER".
   g) A method that returns the minimal number of hours of study for the subject (25 hours each credit).
   h) A method that returns if the subject is of a semester (given as parameter).

   Note: all the constructors and `set` methods must check that code and credits are positive and that semester has as value 'A', 'B', or 'T' (first semester, second semester, or annual); in other case, they will not modify the corresponding attributes.

```
public class Subject {
  private int code;
  private String name;
  private String shortName;
  private double credits;
  private char semester;

  public Subject(int c, String n, double cr) {
    if (c>0) code=c;
    name=new String(n);
    if (cr>0.0) credits=cr;
    shortName=new String("");
    semester='X';
  }

  public Subject(int c, String n, String sn, double cr, char sem) {
    if (c>0) code=c;
    name=new String(n);
    shortName=new String(sn);
    if (cr>0.0) credits=cr;
    if ((sem=='A') || (sem=='B') || (sem=='T')) semester=sem;
    else semester='X';
  }

  public int getCode() { return code; }
  public String getName() { return name; }
  public String getShortName() { return shortName; }
  public double getCredits() { return credits; }
  public char getSemester() { return semester; }

  public void setCode(int c) { if (c>0) code=c; }
  public void setName(String n) { name=new String(n); }
  public void setShortName(String n) { shortName=new String(n); }
  public void setCredits(double c) { if (c>0.0) credits=c; }
  public void setSemester(char s) { if ((s=='A') || (s=='B') || (s=='T')) semester=s; }

  public boolean equals(Object o) {
    return o instanceof Subject &&
           this.code==((Subject) o).code;
  }
```

```
  public String toString() {
    return "Subject "+name+" of "+credits+" credits in semester "+semester;
  }

  public double minHours() { return credits*25; }

  public boolean isOfSemester(char sem) { return semester==sem; }

}
```

2. Implement a program class that has a `main` method that asks for the data of two subjects and calls another `static` method (in the same class) that shows on the screen which one has more credits; if they have the same number of credits, the two must be shown.

```
import java.util.*;

public class TestSubject {

  public static void main(String [] args) {
    Scanner kbd=new Scanner(System.in).useLocale(Locale.US);
    int code;
    String name;
    double cr;

    System.out.println("Input code, name and credits for subject 1:");
    System.out.print("Code "); code=kbd.nextInt();
    System.out.print("Name "); name=kbd.nextLine();
    System.out.print("Credits "); cr=kbd.nextDouble();

    Subject s1=new Subject(code,name,cr);

    System.out.println("Input code, name and credits for subject 2:");
    System.out.print("Code "); code=kbd.nextInt();
    System.out.print("Name "); name=kbd.nextLine();
    System.out.print("Credits "); cr=kbd.nextDouble();

    Subject s2=new Subject(code,name,cr);

    moreCredits(s1,s2);
  }

  public static void moreCredits(Subject s1, Subject s2) {
    if (s1.getCredits()==s2.getCredits()) {
      System.out.println(s1);
      System.out.println(s2);
    } else if (s1.getCredits()>s2.getCredits()) System.out.println(s1);
    else System.out.println(s2);
  }
}
```