IIP

Test Unit 4

Year 2015-2016

Name:

1. Implement a datatype class `TVProgram` that stores data on a TV program. You must develop:

   a) Attributes for start hour and end hour (four integers that represent hour and minute for each one), title of the program (`String`), and audience range (integer)

   b) Three public class (`static`) constant attributes that represent the different audience ranges: 0 for all audiences, 13 for not suitable for children, and 18 for only adults. **These constant attributes must be employed in any place that audience range is used**.

   c) A constructor that receives as parameters start hour and minute, duration in minutes, and title of the program; the constructor must initialise properly all attributes, using *all audiences* as audience range; you can suppose that no program will have a duration over midnight and that all parameters will be correct

   d) `get` and `set` methods for all attributes with the following restrictions:

   - `set` methods refered to hours must avoid modifications that make final hour previous to initial hour (considering both hour and minutes), and must check correct values for hours and minutes
   - `set` method refered to audience range must avoid modifications to values not defined in the constants

   e) An `equals` method that overrides the functionality of that `Object` class method; you must compare all attributes

   f) A `toString` method that returns data on the TV program in the format `ih:im-fh:fm title (audience)`, where `audience` must be "All audiences", "Not for children", and "Only adults". Hours do not need to be written in the two-digit format.

   g) A method that returns the number of minutes of advertisements that can appear during the program airing; it is suppose that the 10 % of the duration of the TV program can be used for advertisements, with a maximum of 30 minutes

   h) A method that, given the age of a person as parameter, returns a `boolean` value indicating if that person is in the audience range of the TV program

```
public class TVProgram {
  private int ih, im, fh, fm;  // Initial hour and minute, final hour and minute
  private String title;
  private int audienceRange;
  public static final int AA=0, NC=13, OA=18;   // All Audiences, Not Children, Only Adults

  public TVProgram(int h, int m, int d, String t) {
    ih=h; im=m; fh=(ih*60+im+d)/60; fm=(ih*60+im+d)%60;
    title=new String(t); audienceRange=AA;
  }

  public int getIh() { return ih; }
  public int getIm() { return im; }
  public int getFh() { return fh; }
  public int getFm() { return fm; }
  public String getTitle() { return title; }
  public int getAudienceRange() { return audienceRange; }

  public void setIh(int h) { if (h>=0 && h<24 && (h*60+im)<=(fh*60+fm)) ih=h; }
  public void setIm(int m) { if (m>=0 && m<60 && (ih*60+m)<=(fh*60+fm)) im=m; }
  public void setFh(int h) { if (h>=0 && h<24 && (ih*60+im)<=(h*60+fm)) fh=h; }
  public void setFm(int m) { if (m>=0 && m<60 && (ih*60+im)<=(fh*60+m)) fm=m; }
  public void setTitle(String t) { title=new String(t); }
  public void setAudienceRange(int a) { if (a==AA || a==NC || a==OA) audienceRange=a; }
```

```
  public boolean equals(Object o) {
    return o instanceof TVProgram &&
           this.ih==((TVProgram) o).ih && this.im==((TVProgram) o).im &&
           this.fh==((TVProgram) o).fh && this.fm==((TVProgram) o).fm &&
           this.title.equals(((TVProgram) o).title) &&
           this.audienceRange==((TVProgram) o).audienceRange;
  }

  public String toString() {
    String s=ih+":"+im+"-"+fh+":"+fm+" "+title+" (";
    if (audienceRange==AA) s+="All audiences";
    if (audienceRange==NC) s+="Not for children";
    if (audienceRange==OA) s+="Only adults";
    s+=")";
    return s;
  }

  public int advDuration() {
    int d=((fh*60+fm)-(ih*60+im))/10;
    if (d>30) d=30;
    return d;
  }

  public boolean inRange(int a) { return a>=audienceRange; }
}
```

2. Write a Java program class that, in its `main` method, asks for the data on two TV programs (initial hour and minute, title, duration in minutes) and creates the corresponding `TVProgram` objects (you can assume that inputed data is correct). Then, it must call to a `static` method in the same class that receives the two TV programs and returns the one with lower amount of advertisements. The `main` must print the data of the returned TV program.

```
import java.util.*;

public class LessAdvert {
  public static void main(String [] args) {
    Scanner kbd=new Scanner(System.in).useLocale(Locale.US);
    TVProgram p1, p2;
    int h, m, d;
    String t;

    System.out.print("Program 1 initial hour: "); h=kbd.nextInt();
    System.out.print("Program 1 initial minute: "); m=kbd.nextInt();
    System.out.print("Program 1 duration: "); d=kbd.nextInt(); kbd.nextLine();
    System.out.print("Program 1 title: "); t=kbd.nextLine();
    p1=new TVProgram(h,m,d,t);

    System.out.print("Program 2 initial hour: "); h=kbd.nextInt();
    System.out.print("Program 2 initial minute: "); m=kbd.nextInt();
    System.out.print("Program 2 duration: "); d=kbd.nextInt(); kbd.nextLine();
    System.out.print("Program 2 title: "); t=kbd.nextLine();
    p2=new TVProgram(h,m,d,t);

    System.out.println(lessAdvert(p1,p2));
  }

  public static TVProgram lessAdvert(TVProgram p1, TVProgram p2) {
    if (p1.advDuration()<p2.advDuration()) return p1;
    return p2;
  }
}
```