Assignment 6, from 2011

Create public abstract class *Exhibit* in the *exhibits* package. The class should have the following elements:

- Private attribute *name* representing the name of the exhibit;
- Private attribute *author* representing the full name of the author, given in the format "NAME SURNAME";
- Private attribute *price* representing the price of the exhibit (e.g., 29.95);
- Private attribute *dateReceived* representing the date when the exhibit arrived to the gallery (object of the GregorianCalendar class);
- Get and set methods for all the attributes. Attributes *name* and *author* must be different than null or empty string, while the price has to be greater than zero. Likewise, the date when the exhibit was received must not be null, and has to represent a moment in time in the past. In case some of the unallowed values are entered (as an input parameter of any of the set methods), an error message should be printed on the screen.
- Public abstract method *print* that neither has input parameters nor a return value.

In the package *exhibits.paintings*, create public class *Painting* as a subclass of the *Exhibit* class. This class should:

- Implement the public method *print* so that the method prints (to the screen) all the available data about the exhibit and states that the exhibit is a painting.

In the package *exhibits.sculptures*, create public class *Sculpture* as a subclass of the *Exhibit* class. This class should have:

- Private attribute *material* representing the name of the material the sculpture is made of
- Get and set methods for the *material* attribute
- Implementation of the public method *print*, which prints (to the screen) all the available data about the exhibit and states that the exhibit is a sculpture.

In the *gallery* package, create the public class *Gallery* with the following elements:

- Private attribute *exhibits* representing an array of objects of the Exhibit class (note: the array will, in fact, contain objects of the Painting class and objects of the Sculpture class)
- Public constructor that initializes the array to 100 elements
- Public method *addNewExhibit* that receives an object of the Exhibit class and adds it to the first free place in the array; an empty place is the one with the null value. The exhibit should be added to the array only if it is different than null and if there is still free space in the array. If either of these conditions is not satisfied, an error message should be printed. If the new exhibit was successfully added, the date of its receipt should be set to the current date.
- Public method *enableDiscount* that receives, as its input parameter, the percentage discount (e.g., 7.5%) and decreases prices of all the exhibits that were received last year (note: the last year should be determined based on the current date).
- Public method that returns an array of objects of the Sculpture class with two most expensive sculptures (owned by the gallery) made of bronze.

Assignment 3, year 2012

In the *cars.tires* package, create the public class *Tire* with the following elements:

- Private attribute *name* that keeps the brand and model of the tire (e.g., "Michelin Alpin A3")
- Private attribute *dimensions* that keeps the dimensions of the tire in the following form "width/height/diameter" (e.g., 155/70/14)
- Private attribute *winterTire* with value TRUE if the tire is suitable for the winter driving conditions, and FALSE otherwise.
- Private attribute *dateMade* representing the date when the tire was manufactured (object of the GregorianCalendar class);
- Get and set methods for all the attributes. Prohibited values for the *name* attribute are null and the empty string. The *dimensions* attribute must not be null and has to be at least 9 characters long. The creation date must not be null. In case some of the unallowed values are entered (as an input parameter of any of the set methods), an error

message should be printed on the screen.
- Overridden method *toString* (inherited from the Object class), which returns a string with all the data about the tire.

In the *cars.tires.searchengine*, create public interface *TireSearchEngine* with

- Public method *displayOffer* with 4 input parameters: width (int), height (int), diameter (int), and isWinter (boolean); the method does not have a return value.
- Public method *addTire* that receives an object of the Tire class as its input parameter and has no return value.

In the *cars* package, create public class *CarRepairShop* that implements the *TireSearchEngine* interface; the class should have:

- Private attribute *tires* as a list of objects of the *Tire* class; the list should be initialized right away
- Implementation of the method *addTire* that receives, as its input parameter, an object of the Tire class and adds it to the beginning of the list. The tire is added only if the input parameter is not null, and if the tire's creation date is some date from the past; otherwise, an error message should be printed to the screen.
- Implementation of the method *displayOffer*, which searches for and displays (on the screen) tires of the requested characteristics (width, height, diameter and if it is suitable for winter driving conditions). Pay attention to the fact that the *dimensions* attribute contains the tire's width, height, and diameter represented as one string value (e.g., "155/70/14").
- Public method that reverses the order of the elements in the list of tires, so that the last element becomes the first one, second but the last becomes the second elements, …, and the first element becomes the last one.