

## 1. Statement of the problem

The student has a BlueJ project with a group of classes and interfaces. Some of these classes have to be modified. The student must implement the following components to complete the project:

1. The interface **Desplazamiento** (which means *displacement*) has to be implemented by the classes that you consider necessary, so that if a class for a new figure is added to the project, the new class automatically inherits the three methods. The functionality of the three methods of the interface is the following:
  - The method **desplazaX** adds the value of its parameter to the attribute **x** of a figure.
  - The method **desplazaY** adds the value of its parameter to the attribute **y** of a figure.
  - The method **desplazaXY** adds the value of their parameters **x** and **y** to the respective attributes of a figure.
2. The class **GrupoFiguras** has to be a *generic* class with a type variable **T** as parameter following the following specifications:
  - The type variable can only be instantiated by the class **Figura** and its subclasses. Use the reserved word **extends** to limit the classes that can instantiate **T** (read page 7 of Practice 2).
  - The figures of the group are stored in the attribute **listaFiguras** with type **ArrayList<T>**, where **T** is the same type variable that the one of **GrupoFiguras**. Note: the class **ArrayList<T>** is placed in the package **java.util.Collection**.
  - The following three dynamic methods have to be implemented in this class:
    - A method **anyadeFigura** that only receives a figure as parameter of type **T**. This method adds the figure to the group if there is not another equal figure already in it. Note you can use the method **estaFiguraEnGrupo** (which means, roughly speaking, *isFigureInGroup*).
    - A method **desplazaXY** that receives two real values (double) as parameters **x** and **y** for moving all the figures of the group changing values of its attributes **x** and **y**.
    - A method **unir** (wich means *join*) that receives as parameter a group **g** of figures of type **T**. This method adds all the figures of **g** to the group the method is applied to (i.e. **this**).

## 2. SOME METHODS OF THE CLASS `ArrayList<T>`

- `boolean add(E e)` adds the element specified `e` at the end of the list.
- `E get(int index)` gives back the element in the position `index`.
- `int size()` returns the quantity of elements in the list.

## 3. Test

The class `UsoGrupoFiguras` contains a sequence of instructions and the expected result of its execution appears between comments at the end of the file.

## 4. Available time to solve the problem

The student has of 45 minutes to resolve the examination.