Programming III
Laboratory 3

Objectives

- classes, objects
- constructors
- objects display
- java comments: add Java comments to the project, generate Java comments

Exercises

1. Create the class *Actor* that has the following attributes: *first name* (private), *last name* (private), *year of birth* (package), *name of the acting school* she/he attended (public). If an actor doesn't attend a school than set the school name with a constant value e.g. "NO SCHOOL"

a) Create 3 constructors for the *Actor* class
b) Overwrite toString() method in order to display objects of type *Actor*
c) Create set/get methods for class *Actor* private variables
d) Create an array of objects of type *Actor* and display it (create another class in order to test class *Actor* functionality)
e) Count how many actors from the array did not attend an acting school
f) Display the names of the actors that starts or are equal with a value that is passed like command line argument
g) Add comments to the *Actor* and test class and generate javadoc for it

2. Create a class *Item* that has the following attributes: *name*, *price* and *quantity*. Add a constructor and a display method for the class. Define class *Container* that contains a array (not list) of Items and has an like fields beside the array of items an *identifier*. At the class *Container* add methods that allows the adding and deletion of items and modification of the quantity of an stored item. Resolve the following requirements:

a) Create an object of type container and exemplify the requested actions on it.
b) For a container calculate the total price of the items stored in it.
c) Create an array of containers and display it

3. Create a class *complex number* and add methods that allow:
a) Creation and display of complex numbers
b) Calculation of module

$$|z|=\sqrt{re^2+im^2}, z=re+im\,i$$

c) Adding 2 complex numbers
d) Multiply 2 complex numbers
e) Create a class, *Test*, to exemplify the implemented methods

Homework (2 weeks)

1. (5p)Create a class *Vector (*that represents a mathematical vector) and add resolve the following requirements:

a) (0.5p) Add methods for creating and displaying an object of type *Vector (e.g v=[1,2,4])*
b) (1p)Add a method for vector multiplication with a constant (v*4 = [4,8,16])
c) (1p)Add a method for two vectors addition
d) (1p)Add a method that verifies if in vector are some elements that have duplicate values
e) (1p)Create a class, *Test*, to exemplify the implemented methods for *Vector* class
f) (0.5p)Add java doc to *Vector* class

2. (5p)Create a class Glasses that has the following attributes: producer, price, solar filter category and a type (reading, sun, …). Resolve the following requirements:

a) (0.5p)Create methods that allow construction and display of objects of type glass

b) (1p)Create an array of glasses and display it

c) (1p)Create a method that finds and displays the less expensive pair of glasses from the array

d) (1p)Create a methods that for each glasses filter category counts the number of glasses of that filter category present in array

e) (1p)Create a function that receives like parameter the name of a producer and an array of glasses and displays the glasses from the array that have been produced by the producer

f) (0.5p)Add java doc to Glasses class and for the helper class