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) Add 3 constructors to 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 an array (not list) of objects of type *Items* and has like attributes beside the array of items an *identifier*. To *Container* class add methods that allows the addition and deletion of items and a static method that modify the quantity of a stored item. Resolve the following requirements:

a) Create a objects of type container.
b) Add/remove items from a container
c) Identify an item from container by name, the name is provided like command line argument, and modify the quantity of that item stored into the container
d) For a container calculate the total price of the items stored in it.
e) Create an array of containers and display it

3. Create a class that models a *complex number* and add methods to it that allow:

a) Creation and display of objects of type complex number
b) Module calculation for a complex number, $|z| = \sqrt{re^2 + im^2}, z = re + im \cdot i$
c) Calculation of the sum of two complex numbers
d) Calculation of the product of two 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 returns an array that contains the unique values present in the vector
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 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 method that for each distinct producer counts the number of glasses produced by that producer 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