

Homework 1

cs1007 - Object-oriented programming and design in Java
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Columbia University
Fall 2005

Due: Sept 27 Midnight.

Reading: Chapter 1, 2-2.7

Objective:

1. Get some theory practice
 2. Practice with some basic Java coding/compiling/debugging
 3. Answer some basic object oriented design concepts
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- 1) Define the following terms in as few sentences as possible
 - a. Static
 - b. Argv
 - c. Reference
 - d. Call by value
 - e. Unsigned long

- 2) What is wrong with the following code snippet?

```
ArrayList<String> strings;  
strings.add("France");
```

- 3) What is the difference between an object and class? What is the difference between a class and a type?
- 4) Think of an online registration system which powers Columbia University, which allows you to add and drop classes. Describe the requirements of such a system. Briefly outline the analysis, design, and implementation of such a system. What would you add to such a system to make it better (based on your own Columbia experiences).

Programming Section

Due to recent budget cuts, we are thinking of replacing the student ID card pictures, with a computer generated image. Due to even more budget cuts we are turning this into a homework assignment. In this assignment, you get to draw your TA! (If you don't feel like drawing your TA (or, heaven forbid, have not met her or him), you can draw the instructor.)

It's going to be a crude picture using lines, arcs, and circles, but we will consider it to be a success if it vaguely resembles a person. It will be a great success if we can actually figure out which TA (or instructor) it is or if the picture conveys something of his or her personality! Be creative!

The requirements for this program is:

1. At least twenty (20) lines, arcs, or circles as part of the drawing. (Include a few of each to demonstrate that you know how to use them.)
2. At least one loop to draw a repeated part of the scene. For example, use a for loop to draw some grass at the TA's feet. (This is also a great way to get a whole bunch of items drawn to work up to the required twenty!)
3. There have to be at least two possible scenes that can be displayed. For example, there can be a happy TA and a sad TA. The difference between the two does not have to be much, e.g., a frown versus a smile.
4. A user-friendly query (in the GUI) allowing the user to input which scene they would like to have displayed.
5. Organize and group your drawing instructions into logical units. For example, group the commands according to which part of the body they are used to draw. Provide a comment for each of these groups of drawing instructions.
6. The class which will be executed should be named HW1.java
7. You need to include a README.txt file which lists which files and what they do (short). Also instructions on how to compile and how to run the code.

If you run into any complex mathematical formulas for calculating the placement of objects, you have gone beyond the scope of this assignment. This is OK, however, so feel free to ask for help from the TAs or the instructor.

Extra credit: dividing the program into logical class/objects (opposed to leaving all in one class).

You will be graded on the following points:

1. The program compiles and executes successfully.
2. The program contains all of the required programming elements listed in the program specification
3. The program is well organized.
4. The program is well commented.
5. The code is nicely formatted (easy to read visually).