CSE 142 - Su 02 - Computer Programming 1
Homework 1

Assigned: Wednesday, June 26
Due: Wednesday, July 3, BEFORE MIDNIGHT

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** General Comments about the Homework **

All homework is turned in electronically. Go the the class web site and use the link on the homework page to do the turnin.

Don't be late! Late homeworks will not be accepted.

The homework assignments will all have three parts: Practice Problems, Graded Problems and a Programming Project.

The Practice Problems are intended to help you understand the material, and give you practice solving the types of problems we have discussed in class. The practice problems are not graded, and you don't turn them in. However, they will be helpful for your learning and I will assume that you have done them. For example, some of the practice problems may show up on an exam. Also, this is where more open-ended problems will show up for those of you who want to go a little further than the basic material. Feel free to discuss these with anyone you like. The idea is for you to learn!

The Graded Problems will be graded by your TA and will form a major part of your overall class score. In total the homeworks will count for about 50% of your class grade, so it is important that you do them and get them turned in. If you have trouble with the homework, ASK FOR HELP! The instructor, the TAs and the consultants are all here to help you learn. You can also discuss the problems with other classmates, but you MUST do your own work and not copy answers.

The Programming Project is a medium sized exercise in writing code. It is based on the lectures and the readings, and gives you a chance to write some real code. There will usually be a skeleton provided that you will download from the web site, and then add new code to provide the required features.

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** Homework 1 Practice Problems ** Do not turn in the Practice Problems.

We discussed many sources of information in class, including our class web site, the Java documentation available from Sun, the documentation for the UWCSE.jar library, the BlueJ tutorial, and the textbooks. Using those resources and others as appropriate, answer the following questions.

1. Where and when does your quiz section meet?

2. What is the complete pathname to the java compiler (filename javac.exe) on the system you are using? The complete pathname starts with the root directory (or the disk name) and ends with the filename javac.exe. For example, on my laptop the complete pathname of javac.exe is "C:\apps\jdk140\bin\javac.exe".

3. When BlueJ starts up, it displays a window with a simple menu bar at the top with menu items "Project Edit Tools View". Select Tools->Preferences, then select the Libraries tab. How many User Libraries are listed? What are their names? (There should be at least one, uwcse.jar.)

4. The UWCSE class library contains several classes that define Shapes of various kinds. Find the documentation of the Oval class. What is the color of the Oval created by this statement:

```
Oval cheese = new Oval();
```

5. If you log on to your account on Dante, you can find out how much disk space you are using by following the menus for "Other" then "Disk". What is your disk space allocation and how much are you currently using?

6. The last day to make changes to your full-term summer schedule without incurring a $20 change fee and possible tuition forfeiture is what day? (Info available from MyUW.)

7. After you have completed the required parts of the Programming Project, feel free to define new shapes and behaviors. I suggest that you do the extensions in a separate class (eg, HW1X) that starts out as a copy of your final HW1Picture, so that you have a clean copy of HW1Picture that you can turn in, no matter what happens with your extensions.

8. Consider the following set of properties for a Java class that describes a ship. Of the types and classes that we talked about in lecture, which one would you pick for each property listed? Explain your selection, including a reason why it is better than the other choices. Select from int, double, boolean, String, <a new class>. Note that there are many possible answers for this question.

```
/**
 * Describe a generic sea-going vessel.
 */
public class Ship {

/** length of the ship in feet */
length;

/** displacement of the ship in cubic feet */
displacement;

/** name of the ship */
name;

/** country of registration */
registry;

/** max number of passengers */
passengerCount;

/** private or commercial? */
usage;

/** owner */
owner;
}
```

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** Homework 1 Graded Problems ** Turn in your answers to the graded problems in a text file.

Each of the following questions is worth 2 points.

1. In the lectures I have mentioned the String class several times. This class is part of the java.lang package in the Java class libraries, and is documented in the Java API documentation. The "other links" page has a link to this documentation. Referring to the documentation, what is the purpose of the String function "trim()"?

2. If you haven't done so already, download the cse142-hw1.zip file and unzip it. The HW1 project skeleton is in the directory hw142\hw1. Open the project using BlueJ. Now start the editor on the source file for HW1Picture. In the upper right of the editor window is a dropdown menu. Pull this down and select "Interface". This will generate documentation for the class definition, based on the comments in the code. Referring to the documentation, what are the fields (properties, instance variables) defined for this class HW1Picture?

3. The documentation for the uwcse class libraries lists all of the methods available for each class of object defined by the library. Referring to the documentation, what is the purpose of the Rectangle method "intersects(Rectangle r)"?

4. The University of Washington home page has a link to MyUW, the source for all kinds of university related information about your current activities at the UW. Log on to MyUW and click the tab labelled "Student" over on the far left. There is a short greeting displayed just to the right of the word "Student". What does it say?

5. Consider the following set of properties for a Java class that describes a building. Of the types and classes that we talked about in lecture, which one would you pick for each property listed? Explain your selection, including a reason why it is better than the other choices. Select from int, double, boolean, String, <a new class>. Note that there are many possible answers for this question.

```
/**
 * Describes a generic building.
 */
public class Building {

/** total floor space in square feet */
floorSpace;

/** number of floors */
floorCount;

/** address of the building */
address;
```

```
/** owner of the building */
owner;

/** architect of the building */
architect;

/** owner occupied? */
ownerOccupied;

/** number of connected telephone lines */
phoneLineCount;

}
```

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** Homework 1 Programming Project ** Turn in HW1Picture.java when you have completed this task.

1. If you haven't done so already, download the cse142-hw1.zip file and unzip it. The project skeleton is in the directory hw142\hw1. Your task is to open the project using BlueJ and modify the existing class HW1Picture to achieve certain "artistic" effects.

2. Start BlueJ and open the hw1 project. Open the HW1Picture source file and compile it. Create a new object from the resulting class definition.

3. Consider the image that is created. It is fairly simple, so you are to add a few interesting details.

4. Specific changes:

4a. Add a wider horizon line that extends across most of the window.

4b. Add a "live" tree to the scene. Such a tree has a trunk like the one already in the picture. It has a crown, which is one or more ovals of some sort, connected to the trunk. The color should be something that indicates spring time, like green.

4c. Implement some tree behavior. A simple example is to change the color from green (spring) to red (fall), or from red to green. When you add new methods to implement this behavior, be sure to comment them so that another programmer can tell how to call the methods.

4d. There is a statement frame=new GWindow(); in the HW1Picture constructor. Modify this statement to pass a String value to the GWindow constructor to set the name of the display window to be your name.