CS 158 Lab 12 February 25, 2010
Animating Drawings in Swing

Here is what you need to know in order to animate drawings. What you've done so far is to create a "model" (in the **applications** package) that contains the logic that controls the **Asteroid** and other objects involved. You have also created (in the **gui** package) a window object that inherits from **JFrame** and a component object that inherits from **JComponent** and is added to the window. The component object must be set up with all of the drawings that have to be displayed before it is added to the window. That image represents one "step" of the animation. To make the animation work, you have to do the following:

a. Display the image as just described
b. Make the program waste some time (sleep). We'll do this with **Thread.sleep(TIME);**
c. Make the application take a step (move everything)
d. Tell the window to remove the old component
e. Set up a new component object with the new locations
f. Add the new component to the window and make it visible
g. Repeat

2. In the **main** method of the **GameWindow** class, create a window, a board with a number of asteroids, and a component that has all the asteroids. Then run a loop that adds the component to the window, makes it visible, sleeps, makes the board move everything, removes the component from the window, and sets up the new component. I recommend creating a helper method to set up the component for you. Also, you will find it helpful to create a constant called **TIME** that you can play with to get the animation to work at a speed that you like. You will find that when you use **Thread.sleep(TIME)** you will have to throw an **InterruptedException**. You may also wish to "unscale" the placement of the asteroids that you did last time and instead use the same size for the **Board** object that you use for the window.

3. See how much you can get done with making asteroids basically move down the screen. You may have to transpose the x and y values. See if you can add a missile in a different color and make it move up the screen. See if you can make the missile go twice as fast as the asteroids. See if you can make the asteroids have random sizes that are not too big and not too small. See if you can make the asteroids move basically downward, but have slightly different left and right directions. Make missiles appear periodically with slightly differing trajectories, but always going up the board.

4. Extra Credit. Here are some things to do over Spring Break for extra credit, if you wish. Make an asteroid "blow up" when it gets "hit" by a missile. To do this, you will have to detect when the asteroid has been hit (when the missile's x and y location is very close to the asteroid's x and y location), and have a blowUp method that causes the asteroid to be removed. Have a blown up asteroid replaced by two asteroids of half the size going in slightly different downward directions, as long as the size of the blown up asteroid is big enough (otherwise no new asteroids are created). Have asteroids blow up if they run into each other. Draw a "missile launcher" that appears at the bottom of the screen, and from which the missiles appear. If you are able to do any of the extra credit part, please send me an email to claim the extra credit.