CMSC 113: Computer Science I
Lab #3: Slingshot

Write a program that simulates a ball (represented by a `GCompound` object) traveling under the influence of gravity. Start the ball in the lower-left corner of the applet. It should not be moving. When the user clicks, the ball starts moving up and to the right, arcing downward. When the bottom of the ball reaches the bottom of the applet, the ball should stop. Clicking while the ball is moving causes nothing, but clicking after the ball has stopped resets the ball back to the lower-left and restarts its trajectory.

To achieve the effect of gravity, you need the speed of the ball to change. As with anything else that changes in a program, you will need to use a field to store this speed. Because we want the speed to change relatively slowly, this field must be a `double` field (which holds decimal values). Furthermore, because gravity only works on vertical movement (a ball doesn't change speed if we only look at horizontal motion), we really only need to worry about the change in the *y*-coordinate.

So, your compound object will have a field representing the *y*-coordinate speed. Every `update`, the ball `moves` according to this speed. Also at every `update`, this speed changes, to represent the power of gravity. Naturally, `update` is called at every timer tick.

Firing the slingshot will happen in a `fire` method. This method takes two parameters, indicating the initial *x*-velocity and the initial *y*-velocity of the slingshot. Your `mousePressed` method will call `fire`.

With this done correctly, it should be extremely easy to expand your applet to have two balls with different trajectories.

After you get all of the above working, make it so that the initial speed of the ball is controlled by the length of time that the user holds the mouse down. A method named `mouseReleased` will be helpful, which tells you when the mouse has been released.