Lab 3 - Teaching Handout
By Ruchir Rastogi and Guy Blanc

Warmup: True/False questions

Feel free to go over these either before or after tackling problem 1.

Problem 1: MakeBoxes

This problem tests students' understandings of how variables, both primitives and objects, are passed between method calls. Students can first trace through the code (guided questions are included in the handout). After tracing by hand, they can run the code in a provided .java file to see if the console output matches what they expected. You can use this as a group exercise, asking them to explain why the output equals what it does.

Common mistakes:

- Changing value of int (primitive) in callee method does not change value in caller method
- Order of arguments passed in determines what the parameters in the callee method are; the names of the variables do not

Problem 2: RandomCircles

This problem is taken from previous section handouts. We break down the problem into two milestones, where the student first creates just one circle and we ask them to test their solution. One major learning goal is for students to get in the habit of giving themselves checkpoints and then testing their code to ensure it does what it's supposed to.

Common mistakes:

- Forgetting a GOval's location is specified by the coordinates of the top left of its bounding box
- Not ensuring the circles are always on the screen

Problem 3: MouseCircles

This problem tests decomposition and use of mouse events. They should decompose to a method that draws a circle centered at the parameters, and call that method when the mouse is clicked.

Common mistakes:

- Not centering the circle properly
- Forgetting to randomize color/radius

Problem 4: Hogwarts trace

This tracing problem is taken from previous section handouts

When students run HogwartsChecker.java, they will be asked to input their answers to the seven questions posed in the section handout. They will not be allowed to progress until they correctly answer the previous question. This approach should help students correct fundamental misunderstandings as early as possible.

Common mistakes:

- Integer division involves truncation of output
- Changing value of int (primitive) in callee method does not change value in caller method