# Assignment #3—Graphics and Interaction

Due: Wednesday, September 19

Just two problems this week. To make sure that you have the most recent release that fixes as many bugs as possible, you should download the latest version of `pgl.py` from the website and watch the announcements space for notices about bug fixes. Problem 2 requires the material from Chapter 5, which is up on the website and which is covered in this Friday's lecture.

Problem 1 (Chapter 3, exercise 13, page 111)

A particularly exotic optical illusion is the ***kindergarten illusion*** (also called the ***café wall illusion***), first described by the American psychologist Arthur Henry Pierce in 1898. In this illusion, shifting the squares slightly on each row of a checkerboard pattern makes the horizontal lines of the checkerboard appear slanted instead of straight. Starting with the `Checkerboard.py` program in Figure 3-13, make the changes necessary to produce the following image:
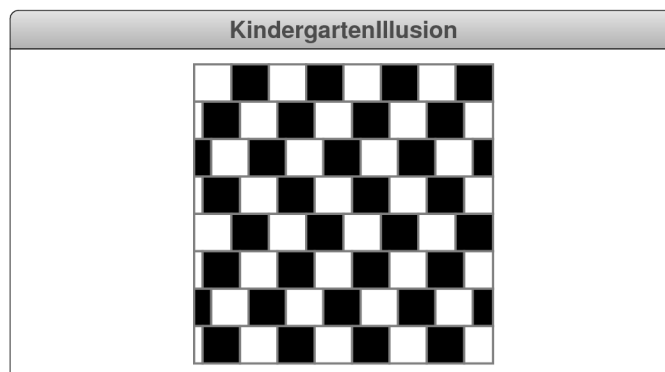
Problem 2 (Chapter 5, exercise 3, page 186)

In addition to line drawings of the sort generated by the `DrawLines` program, interactive drawing programs allow you to add other shapes to the canvas. In a typical drawing application, you create a rectangle by pressing the mouse at one corner and then dragging it to the opposite corner. For example, if you press the mouse at the location in the left diagram and then drag it to the position where you see the cursor in the right diagram, the program creates the rectangle shown:
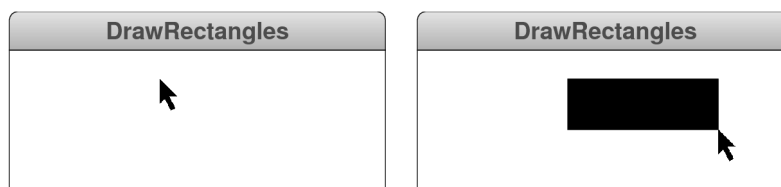
The rectangle grows as you drag the mouse. When you release the mouse button, the rectangle is complete and stays where it is. You can then go back and add more rectangles in the same way.

Although the code for this exercise is quite short, there is one important consideration that you will need to take into account. In the example above, the initial mouse click is in the upper left corner of the rectangle. Your program, however, has to work just as well if you drag the mouse in some direction other than right and down. For example, you should also be able to draw a rectangle by dragging to the left, as shown in the following illustration: