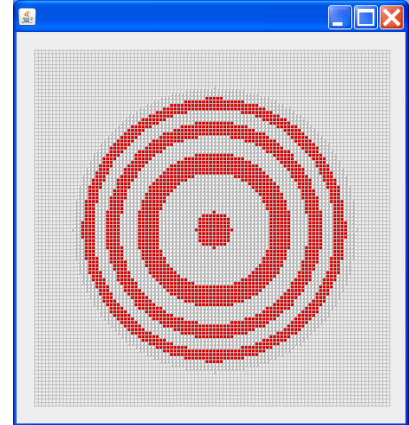


Programming I

Lab 7

Programming exercise 1 (Bullseye)

Write a program that draws a bullseye as a sequence of alternating white and red circles drawn from largest to smallest one on the top of the other. Use the `FillCircle` program in Section 7.5 as a starting point. To the right is an example of what the board might look like.



Programming exercise 2 (cellular automata)

Modify the program `CA30.java` (posted on the web page) to create a cellular automaton that implements rule set 110. The details of rule set 110 and a graphics file of the automaton can be on the the wikipedia page on cellular automata:
http://en.wikipedia.org/wiki/Cellular_automata

Programming exercise 3 (interactive board)

For this exercise you are to implement the `mouseClicked` and `mouseAt` methods in the `Board` class to create the following effect: If the user clicks on a cell, its color changes randomly, and when the mouse pointer moves over a cell, its color is negated (don't forget to import the class `Random` in the beginning of `BaseBoard.java`). To obtain a cell's color, you can invoke the `getColor` method as follows:

```
Color c = this.getColor(x, y);
```

To negate the color, you will first retrieve the intensities of the RGB colors before subtracting those values from 255 to create the negative color (for instance, the negative of a color with RGB values (10, 100, 200) is (245, 155, 55). This can be done by invoking the methods `getRed()`, `getGreen()`, and `getBlue()` on the color object, which return the corresponding intensities of the primary colors:

```
int r = c.getRed();  
...
```

For this exercise, turn in the modified `BaseBoard.java` and another `.java` file that creates a `Board` object.