# CS152L – Assignment 3

Summer 2008 – Matthew Barrick Due 07/17/2008 11:59 PM

#### **Overview:**

You will be implementing Conway's Game of Life as described in class. You may want to refer to the Wikipedia page http://en.wikipedia.org/wiki/Conway%27s\_Game\_of\_Life for more information.

You program should perform the following steps

- 1. Load the initial grid of cells from a file (see the section Input Specification for file format).
- 2. Display the initial state of the grid both in textual and graphical format (see the section Output Specification for details).
- 3. Update the grid n times (where n is specified by the input file).
- 4. Display the final state of the grid both in textual and graphical format.

## Input Specification:

You will read the parameters for your simulation from text file. You should use FileChooser to provide the user a way to select the file. The general form of the input file is:

```
rows r
columns c
steps n
grid
0 1 0 1 0 ... 0 1
1
0
1 1 0 1 0 ... 1 1
```

Where r, c, and n are strictly positive integers. After the line-containing grid there will be r rows each of which have c space-separated columns each containing a 1 (representing a live cell) or a 0 (representing a dead cell).

A number of sample input files will be posted on the website. You are welcome to share your test input files with one another (or email them to me to be posted).

## **Output Specification:**

You must provide two forms of output, textual and graphical (examples are shown below). For the textual form, you should display at least the grid of cells as per the input specification. For the example data file "conway\_1.txt" you should be able to display as this:



For the graphical form you want to create an image (Picture) where the corresponding pixels are black for 1 and white for 0. (You will likely want to make each cell be drawn as multiple pixels (say 10) so that the image is a decent size).

#### Implementation Requirements:

Your program should consist of at least source files: Conway.java and Cell.java.

Conway.java should contain your main method, and Cell.java should contain a class Cell that represents an individual cell in grid. What method you implement in that class is up to you, but I recommend at least toString and toColor (return a java.awt.Color object represent the color appropriate for that cell). The grid should be represent by a two-dimensional array of these cells.

When determines the neighbors of a cell you treat the borders of the as if they wrap around (topbottom and left-right). Given a grid which is width by height you can find the wrapped position of a position (x, y) with the expressions: (x+width) %width and (y+height) %height.

### **Extra Credit:**

You may earn up to 10% extra credit on this assignment by implementing a way to display the evolution of the cell grid through its time steps. The book contains information on making animations for example. If you do this part, create a separate class to house its main method.

## Hand-in Details:

Your hand-in should consist of your source files (minimally Conway.java and Cell.java) and at least one sample input file which you have created (look on the web for fun Game of Life shapes).