CS211 **Computers and Programming** **Handout 4**

ASSIGNMENT 3: GUI Building

Fall 1999 **September 23, 1999.**

DUE DATE: October 7.

In this assignment a graphical user interface (GUI) will be implemented to play the game of Life. The GUI consists of two windows, shown in Figure 1 and Figure 2.
You can design the *layout* for the two window as you wish but it should include the respective components shown in Figure 1 and Figure 2. Use extra panels where appropriate to group components.

The Main Window

The main window is shown in Figure 1. It comes up when the program is started. It allows the user to load a new game at any time by clicking the **New Game** button. This brings up a *modal* dialog window shown in Figure 2. User interaction with the modal dialog window is explained below.

Clicking the **Quit** button obviously terminates the program.

Clicking the **Step by** button runs the game for the number of generations specified in the box to the right of this button. You can either choose to display each generation that is computed or only the final generation after every click of the **Step by** button. State explicitly what your program does. The number of generations that can be run must be greater than zero. The default value in the box can be set to 1 by the main window.

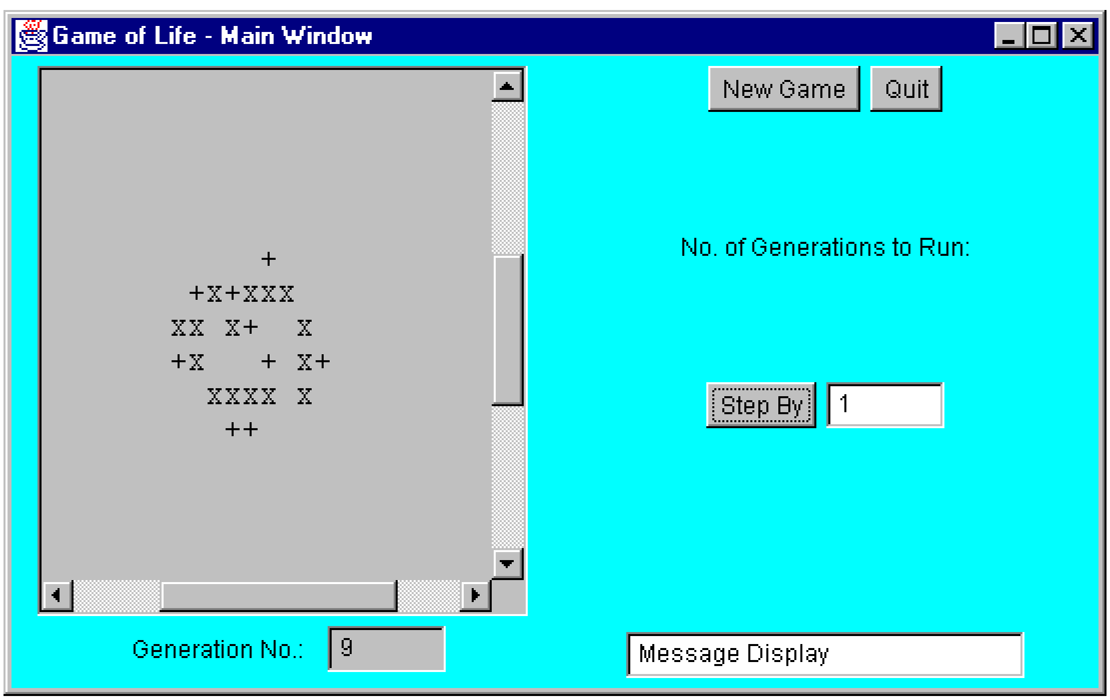

Figure 1

A generation can be displayed in a *text area* (using a `mono-spaced` font) as shown in Figure 1. This can be done by constructing a `String` representing the textual representation of each cell, and setting it in the text area. The user might notice that she has to scroll the text area between updates in order to see the results in the display, but this is normal — the scrollbars reset to the start of the text area every time the text area is redrawn. The text area is obviously not editable. The generation number of the current generation is indicated in an appropriate field as shown in Figure 1. The user should not be able to edit this information.

The main window should not allow the user to click the **Step by** button unless a game has been loaded and a valid value for the number of generations to run has been specified.
The Message Display text field can be used to give feedback to the user.

The Modal Dialog Window

The modal dialog window in Figure 2 comes up when the user clicks the **New Game** button in the main window. The necessary parameters for running the game are specified in this dialog window: the size of the grid, the choice of game to play and the file name for the file containing the initial generation. Clicking the **OK** button in the modal dialog window should *validate* the parameters and pass them to the main window only if they are valid. The grid size should be specified as positive integers, choosing the game can be implemented using *radio buttons* so that the user can only make one choice, the file name should denote a valid file. Any messages to the user concerning the parameters can be displayed in the Message Display text field in Figure 2. Of course the dialog window can provide default values for these parameters in the appropriate fields.

The modal dialog window is only dismissed if the user clicks the **OK** button and all the information specified is valid or when the user clicks the **Cancel** button, in both cases the main window is informed appropriately. Since this window is modal, the user must dismiss it (either by clicking the **OK** button or the **Cancel** button) in order to proceed with the game in the main window.

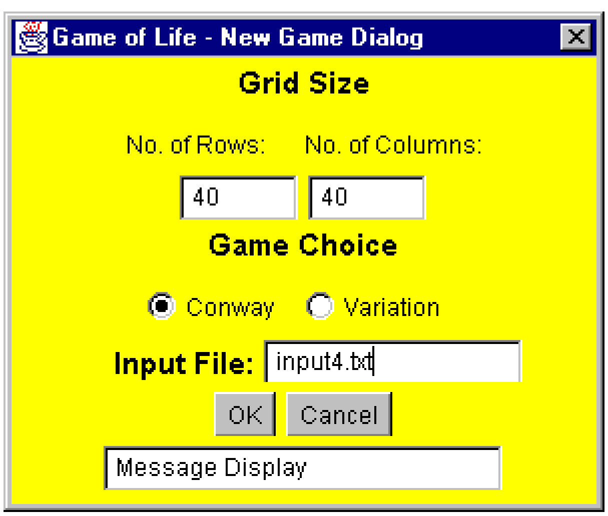

Figure 2

What to hand in:

Hand in the design documentation (preferably class diagrams, collaboration diagrams and containment hierarchy diagrams) and the code (preferably documented with javadoc comments), and the screen shots of the 9th and the 21st generation computed by running the two versions of Life on the following initial generation on a 40x40 grid:

20 20
21 20
21 21
21 22
22 20
22 22
23 22