

Math 140 Math Modeling: NetLogo and the Game of Life

1. If NetLogo isn't already installed on your computer (it should already be installed on the computers in Mudd 014), download and then install NetLogo following the directions at <http://ccl.northwestern.edu/netlogo/download.shtml>.
2. Open NetLogo. Under the File menu, select Model Library; then, under Sample Models/Computer Science/Cellular Automata, select Life.
3. Read text in Info tab (located at the top middle of window), glance over Code tab to see what programs in NetLogo look like, then go to the Interface tab to explore the model.
4. With the initial density slider bar set anywhere between 20% and 30%, hit "setup-blank" to clear the window, then hit "setup-random" to randomly generate the initial conditions (which patches are alive or dead). Now hit the "go-forever" button. Observe the different patterns that emerge from the 2 simple rules for each individual patch. You can change the speed using the slider bar at the top of the window, if you want to slow things down to more carefully observe the changing patterns or speed things up to see what happens in the long-term.
5. Next hit "setup-blank" then "draw-cells." Now you can click on the window to create your own initial conditions. Experiment with different patterns to see what happens. You can either click on "go-once" to do one step at a time, or hit "go-forever" to run continuously.

Activities: Results to be reported in class on Wed Sept 5, JOCH202. You may work in pairs.

1. Make a list of patterns that remain static (don't change once they are formed, unless something else runs into them).
2. Make a list of patterns that cycle and their "period" (how many different stages does each cycle through).
3. Experiment with what happens to n patches in a single line, where n equals 1, 2, 3, ..., or 10. Record the patterns with each.
4. Run an experiment of your own to discover something interesting that can happen in this simple model. Record the initial condition and general idea of what patterns emerge.