Checkpoint 2 - ReadMe

To run in terminal:

python 'checkpoint 2.py'

You’ll then be prompted for which simulation you’d like to run. For game of life type GoL and for SIRS type SIRS.

Game of Life:

For the game of life there are 3 options for the initial conditions: random, glider, or blinker.

The glider and blinker initial conditions will display a single glider or blinker. The random initial condition is a random arrangement of dead (green) and live (yellow) cells. The simulation allows you to calculate equilibration time.

After being prompted for an intial condition you will be prompted for a number of steps, lattice dimensions and whether you wish to animate (Y/N). If the initial condition selected was random you will also be asked how many simulations you wish to run. 1 simulation will produce a graph showing the number of live cells against time step. Anything more than 1 will produce a histogram of equilibration time.

SIRS:

There are 3 options regarding the SIRS simulation: observe, immunity, p1p3, and variance.

The observe simulation simply lets you observe the population of cells under different conditions. You will be asked to assign probabilities for becoming infected (p1), recovering (p2), and becoming susceptible again (p3). Green cells are susceptible, purple infected, and yellow recovered.

The immunity simulation will produce a graph of infected fraction vs immunity fraction. The probabilities can be adjusted in the same way as in the observe simulation. Immune cells are yellow, infected purple, susceptible blue, and recovered green. The graph in the file is produced using p1=p2=p3=0.5.

The p1p3 simulation produces a contour plot counting the number of infected sites at all combinations of p1 and p3 (interval of 0.05) keeping p2 fixed at 0.5. It also produces a variance contour plot for this.

Finally, the variance option produces a variance plot of variance of infected sites against p1 between 0.2 and 0.5 (interval 0.05), with errors calculated using the boot strap approach. The probabilities p2 and p3 are kept constant at 0.5