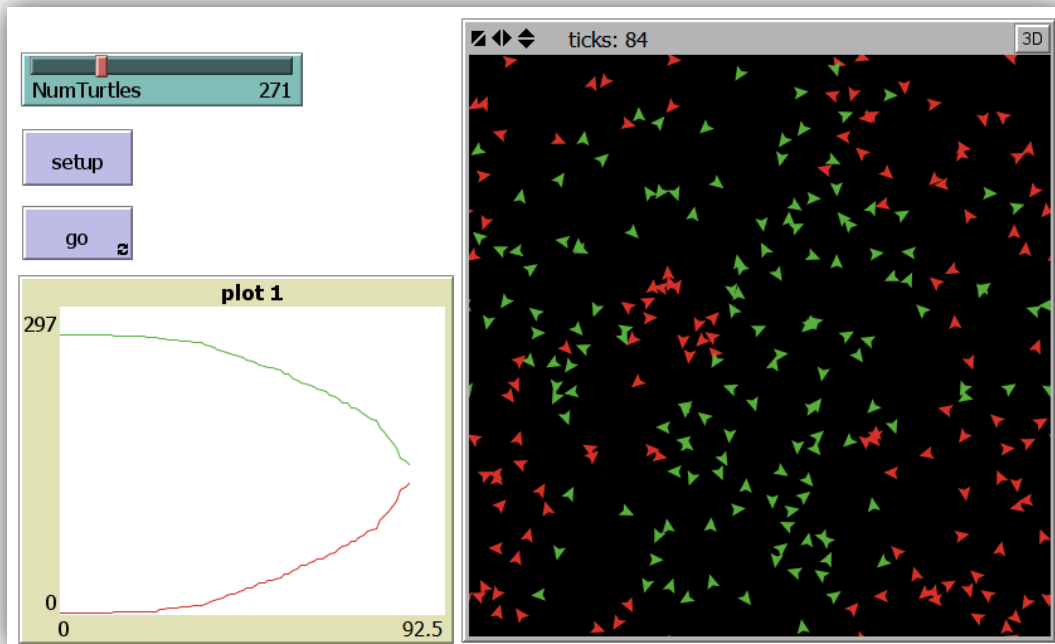


LAB 12: SPREAD THE RED: AN EPIDEMIOLOGY MODEL



Model Overview:

In this lab, you will be writing program that represents a simple epidemic model. There is one sick agent and it spreads it disease to the rest by contact (sharing the same patch). We will build the simple Epidemic Model first and then add to it. The more you add, the more points you get!

The Basic Model:

The basic model has the characteristics:

- There are agents in the model.
- You should be able to change the number of agents using a slider!
- Each agent is either healthy or sick.
 - You need to be able to visualize whether they are healthy or sick by their color (i.e. red sick and green healthy). And it is NOT their favorite color!
 - You also need to set up Boolean Agent variable that contains that information (i.e. turtles-own [sick?])



- Sick agents get other agents sick. This happens when a sick agent collides with a sick agent (i.e. shares the same patch as a healthy agent).
- Agents wiggle to move around.
- Initially only one agent is sick.
- The world wraps around! Your agents live on a doughnut!
- Once an agent is sick, it stays sick forever: no recovery, no death, nothing. It is forced to wiggle around its world sick as a Well you get the idea.
- You are very anxious about your agents and like to keep track of their health. You graph the number of sick agents and the number of healthy agents giving each line a different color - there was a video that covered graphing so go back and watch it if you need help! Don't forget about ticks!

That's it for the basic model!

Adding Features - The more you do, the more points you get:

- You allow the poor sick agents to pass away peacefully after a period of time. To do this you will probably need a new agent variable that would contain a number that represents how long they have been sick (perhaps `SickTime`) and a new global variable that holds the maximum amount of time that the turtles can be sick (perhaps `MaxSickTime`).
- After wandering around aimlessly they finally find a hospital and are cured. The sad truth that they do not know is that they can get sick again! What does this mean in terms of your model? Will you set aside a part of your world for the hospital and make the patches a different color? How will you get the agents to notice that they have entered the hospital? What happens to the turtles color and turtle's variable values?
- Good news, some of your agents are getting stronger! Some of them are actually able to fend off this dread disease and are cured without going to the doctor. Not only are they cured; they are IMMUNE to the disease afterwards. They are joyous and turn yellow - or whatever color means happiness to you. You probably will want to create a new agent variable that keeps track of whether or not they are immune. Remember not all the agents who are sick get better again and those that do will not be able to get sick again - the lucky.... Agents!



Have Fun Coding!

Grading Rubric [20 points total]:

[A: 2 points]: Submit the NetLogo source code named:

`W12_firstname_lastname.nlogo` to your instructor:

[B: 2 points]: The first few lines of your code are comments including your name, the date, your school, and the assignment name.

[C: 2 points]: The code in the code tab of your program is appropriately documented with "inline comments".

[D: 4 points]: When "setup" is clicked, the NetLogo world is cleared, agents are created and one of the agents is sick. All the agents are the same color EXCEPT the one that is sick, which is a different color! You have created an appropriate agent variable to track if the agents are sick or healthy.

[F: 4 points]: When "go" is clicked

- The agents wiggle around the wrapped world
- When a sick agent shares a patch with healthy agents, the healthy turtles get sick!
- When a turtle gets sick it changes color and its agent variable indicates that it is sick!

[F: 6 points]: Input and Output:

- You have a slider that inputs the number of agents in the model.
- You have a graph that shows the number of sick and the number of healthy agents as the model progresses.

[EXTRA CREDIT: 5 points]: Sick agents die after a period of time. You have created a new agent variable that keeps track of how long each agent has been sick. You have also created a new global variable that holds the maximum amount of time a turtles can stay sick. This variable (the maximum amount of time variable) has a slider so you can change it and see what happens!



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[EXTRA CREDIT: 5 points]: There is a hospital section of the NetLogo world indicated by a difference in patch color. The agents become healthy if they enter the hospital but are NOT immune. The agents change their color and the value of their agent variable that keeps track of their health.

[EXTRA CREDIT: 5 points]: The agents can become immune; there is a certain probability that they can get better. You have created a new agent variable that keeps track of which agents are immune and agents that are immune are a different color. You keep track of the number of immune agents on your graph.