CIS 716.5 Spring 2010, Project I

Description

The project is to build a simulation of agents playing the *t-shirt* game (see the notes for Lecture 6, and the textbook page 174). The game can be described thus:

> Consider a group of agents, each of which has two t-shirts, one red and one blue. The agents — who have never previously met, and who have no prior knowledge of each other — play a game, the gola of which is for *all* the agents to end up wearing the same-colored t-shirt (it doesn't matter whether the color they all end up wearing is red or blue).

> Initially each agent randomly selects the color to wear.

> After that, the game proceeds in rounds. On each round every agent is paired up with exactly one other agent; pairs are selected at random. Each pair gets to see the color of the t-shirt that the other is wearing — no other information or communication between the agents is allowed. After a round, each agent is allowed to decide which color t-shirt to wear (either changing or staying the same).

Implement this game

Write a Netlogo simulation of agents playing this game. Since Netlogo naturally lends itself to simulations in which agents move, you can modify the notion of a "round" so that it involves the agent moving, and make the "pairing" of the agents to be, for example, when they are on the same square. So long as the agents move randomly, there should be no bias in the selection.

Things your simulation must do the following:

1. The simulation must update *on ticks* (see the Netlogo manual to get a full explanation of this), and it must display a count of the total number of ticks that have elapsed in a simulation.

2. The simulation has to show the red agents and blue agents at each tick in the simulation window.

3. The simulation must display the number of red and blue agents at each tick.

4. The simulation must stop once all the agents are red, or once all the agents are blue.

5. The simulation must allow the user to pick the number of agents and the proportion that are initially red or blue.

Aside from this, I don't mind how you solve the problem (and the more, different, solutions I get, the better :-)

If you want a hint, look at the picture on the webpage — that is a screenshot of my solution. I based it on the Termites model (though there is very little of the termites code that ended up being used).

Strategy update

The textbook and lecture notes describe a number of stratgies for deciding what t-shirt to wear. Your simulation should include one of these strategies, and one other that you invent yourself.

Document

All you are going to hand in is the Netlogo program so make sure you:

1. Write lots of comments in your code. If I don't understand what your code does, you won't get full credit.

2. Write a description of your program in the Information tab. Here you should write an overview of the problem and the strategies that you have implemented.

Experiment

Once your simulation is complete, experiment with different numbers of agents, different initial proportions of red and blue, and different strategies, seeing how many ticks it takes for the whole population to decide on the same color t-shirt. Since there is randomness in the simulation, you'll need to do several runs (say 10) of each combination in order to get a reliable idea of how they perform.

Describe the results of your experiments, including the statistics you collect, in the Information pages of your project.

Hand it in

Save your model as `<my-name>-tshirt.nlogo`, where you replace `<my-name>` with your own name (so my program would be called `parsons-tshirt.nlogo`) and email it to me at `parsons@sci.brooklyn.cuny.edu`.

The subject line of your email should say: 716.5, Project 1.

If you don't get an acknowledgement within 24 hours, send me a follow-up email.

The due date for the project is April 25th.