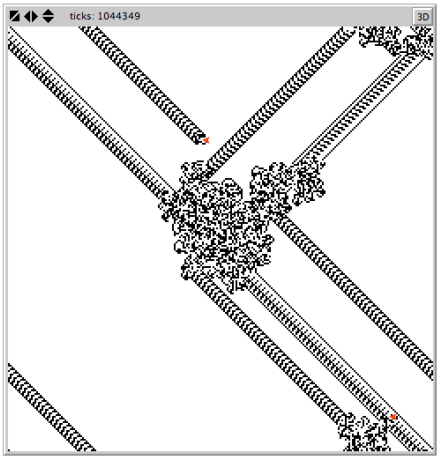
Lab 3 part 2: NetLogo Experiments with Virtual Ants



There are two NetLogo video lectures that accompany lab 3 part 2:

1) NetLogo and Langton's Ant – part 2a (required in week 4)
2) NetLogo and Langton's Ant – part 2b (optional in week 4)

Assignment For Week 4: (note Lab 3 was extended into week 4)

The "NetLogo and Langton's Ant – part 2a" extends the model from part 1 for the version you will be entering, running and using this week.

Even though the code is complete in the video, it remains part of this assignment for you, the student, to type that code and get it to run.

After you get the Vants2 program running, you are to design and run experiments that address the following questions:

1) In model we built in this assignment, with 2 ants starting from fixed locations, how did the long-term behavior of the ants differ from that of the single ant in the first Langton's ant model we built (in week 3)?
2) In the first Langton's ant assignment, in week 3, we saw that symmetry was lost within the first 500 iterations of the rule. Did you observe any long-term symmetry in the model with 2 ants? Describe what you observed in this model, with regard to symmetric or asymmetric behavior.

Also answer the following questions, but feel free to treat them as "thought experiments" - that is, try to answer after time for reflection, but without necessarily building an implementation:

3) What long-term behavior would you expect to see in the 2-ant model, if <u>all</u> of the patches started out as either red or green?

Optional Work For Week 4:

The "NetLogo and Langton's Ant – part 2b" extends the model from part 2a.

The code is complete in the video; however, it incorporates a number of NetLogo techniques that will be new to many of you; you'll need to pay close attention to the code changes.

After you get the this program running, you are to design and run experiments that address the following question:

4) Using this model, how did the long-term behavior of 3 or more ants differ from that of 2 ants?
5) Each time you run this model with 1 ant, the ant color, initial heading, and initial position are randomized. How do these differences in the ant's initial configuration affect the patterns seen in the terrain (before the terrain is completely covered by the chaotic arrangement)?

Grading rubric for week 4 [10 points for required portion]:

[1 points]: Attached the file in Blackboard Learn with the file name:
`Vants2.`*firstname.lastname*`.nlogo`**

Note: DO NOT copy and paste your source code into Blackboard Learn. You must ***attach*** the NetLogo source file.

*****After attaching, you MUST CLICK SUBMIT *****

[1 points]: The "info" section of each your programs includes your name, the date and a description of what the program does.

[8 points]: Using the Vants2 model, design and run experiments that attempt to answer questions 1-3 (above). Describe your design, list the experiments you ran, report your results and state your conclusion. All this reporting must be included within the "info" tab of the **`Vants2.`***firstname.lastname*`.nlogo` file you submit into Blackboard Learn. Note: The points you earn for this section are NOT based at all on your conclusion. Rather, they are based on the on the following criteria:

a) Is your experimental design well-conceived? This includes number of experiments run and ranges of values tested.
b) Is your reporting clear, well organized and easy to read?

5 points for optional portion:

[1 points]: Attached the file in Blackboard Learn with the file name:
`Vants3.`*firstname.lastname*`.nlogo`**
Note: DO NOT copy and paste your source code into Blackboard Learn. You must ***attach*** the NetLogo source file.

*****After attaching, you MUST CLICK SUBMIT *****

[1 points]: The "info" section of each your programs includes your name, the date and a description of what the program does.

[3 points]: Using the Vants3 model, design and run experiments that attempt to answer the questions 4-5 (above). Describe your design, list the experiments you ran, report your results and state your conclusion. All of this reporting must be included within the "info" tab of the
`Vants3.`*firstname.lastname*`.nlogo`** file you submit into Blackboard Learn.
Note: The points you earn for this section are NOT based at all on your conclusion. Rather, they are based on the on the following criteria:

c) Is your experimental design well-conceived? This includes number of experiments run and ranges of values tested.
d) Is your reporting clear, well organized and easy to read?