

Beginning NetLogo Activities

- **Survey** (due by NOON on Friday, April 5th)

Please complete the following survey: <http://goo.gl/6Ed6I>

It is also linked to from our course website: <http://ccl.northwestern.edu/courses/mam2013>

- **Download NetLogo 5.0.4** from <http://ccl.northwestern.edu/netlogo/>

Several tutorials are included when you download NetLogo. They're in the User Manual, which you can access from NetLogo's Help menu. Please complete at least the first two tutorials. You can then proceed to the third tutorial or dive right into the exercises below. The *NetLogo Dictionary* (also found under the Help menu) may also be useful for finding commands that you will need to complete the exercises.

- **Exercises** (due by 9AM on Monday, April 8th)

Write NetLogo procedures to do the following:

1. Write a procedure named "scatter" to distribute some turtles randomly in the view. Write another procedure named "scatter2" that distributes turtles randomly in a different way. Use two different buttons to launch these procedures.
2. Write a procedure to get a color to spread from patch to patch. (There are many ways to do this, just pick one you like). Use a button to launch this procedure.
3. Write a procedure that makes the turtles chase after the mouse cursor. Use a button to launch this procedure.
4. Create a "cloud" of turtles, half of them one color and half of them another color. Based on a probability, have one color of turtles move up and the other color turtles move down. Add a button to control the movement – when pressed, the turtles will move (similar to the GO button in the Turtles Circling model in Chapter 0). Label the turtles with their WHO number. Add another button to toggle the turtle labels on and off. Finally, create a monitor that keeps track of how many times one turtle has moved.

Note 1: There are many useful "code examples" to learn from, found in the Code Examples folder of the NetLogo's Models Library, which is accessible from the NetLogo File menu.

Note 2: If you get stuck, don't be afraid to request help.

- **Present a model** (due by 5PM on Wednesday, April 10th)

Browse the NetLogo models library and select one model you find interesting. (Please avoid the following folders: Games, Code Examples, Optical Illusions, and System Dynamics. We discourage choosing HubNet Activities unless you are already familiar with NetLogo.) Study that model and be prepared to make a short (5-10 minute) presentation on it for next class (including PowerPoint slides). We will choose a few students to present in class on Thursday. In your presentation, you should: explain what the model shows, give a demonstration of the model, and describe why it is interesting, what is emergent, and how it works. Be sure to *explicitly describe the rules* the agents are following. Try running the model in different ways. What set of parameters gives you the most interesting behavior? *This doesn't need to be a long/fancy presentation!*

Use the textual pseudo-code format below to describe the rules:

The following example describes the rules for the Ants Simple model in the Box folder.

Initialize

Create an ant nest in the middle of the world.
Create three food piles in the corners of the world.
Create POPULATION ants all located in the nest.

At each clock tick:

Each ant does:

1. If I am not carrying food, then I will try to sense for a pheromone trail nearby.
If I sense pheromone then I will turn toward its strongest source.
2. If I am carrying food, I will turn toward the nest and drop pheromone on the ground below me.
3. I will turn randomly a small amount and move forward.

Each patch does:

1. Evaporate a percentage (set by the EVAPORATION-RATE slider) of my pheromone.
2. Diffuse a percentage (set by the DIFFUSION-RATE slider) of my pheromone to my eight neighboring patches.

Deliverables

The two assignments (exercises and presentation) should be sent as attachments to this address: upload.Assignm.8xv2vbngvh@u.box.com

Please submit the exercise portion of the assignment by **9 AM next Monday, 4/8/2013.**

The attachment should be a single ZIP file named **YourFullName_HW1.zip** containing one NetLogo file containing solutions to the exercises, preferably with a different button to run the code for each exercise.

Please submit your presentation slides by **5 PM next Wednesday, 4/10/2013.**

You should turn in a single ZIP file named **YourFullName_HW1-pres.zip** containing your presentation slides (PPT or PDF) about the model you chose. Specifically include the textual description of the rules of the model (see above).

In addition, you should post one message to blackboard asking a question about NetLogo primitives/syntax or sharing with the group something cool you figured out.

Assigned Readings

All readings can be found in the "Readings" folder on Box.

Read by Tuesday class (**April 9th**):

- Textbook – Preface. Chapter zero.

Read by Thursday class (**April 11th**):

- Textbook – first half of Chapter 1, up to the "What is Agent-Based Modeling" section on page 10.
- Additional Paper – Wilensky, U. (2001) *Modeling Nature's Emergent Patterns with Multi-agent Languages*. Proceedings of EuroLogo 2001. Linz, Austria.