THE UNIVERSITY of NEW MEXICO

Lab 14 and 15: The Final Project

The final project of CS-151 is a group project!
Make it cool!
Make it awesome!
Make it yours!

Milestone 1: The Proposal

Form a group of 2 or 3 students. Generally, these should be students from your own school. However, it is possible to group with someone taking CS-151 on a different campus you can work out a way to corporate with that person.

Each team must turn in a proposal that must include:

1) Project Title
2) Project Overview
3) List of team members (2 or 3) and school.
4) Description of what each person will be doing.
5) Grading Rubric – Must add up to 40 points divided between model development, experimentation and write-up.

The proposal needs to have enough detail so that instructors can read it and give you feedback such as "that will be too much to get done" or "that is a great start, but to get an A, you also need to do ....".

Milestone 2: The Working Model and Results

Your final project must be a NetLogo Model together with a written discussion of the results of running that model.

You may create a model from scratch, expand a model we have developed during the course or expand one of the models in NetLogo's Model Library.

Some projects may focus on model development with a fairly short data acquisition and discussion of results. Others may focus their efforts on discussion of results while making relatively slight changes to an existing model. Still other groups may choose to split their efforts equally between these two aspects.


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Project Suggestions:

Idea 1) Nemo meets Sharks:

Add a shark species. Sharks cannot eat plankton, and need to eat fish. The sharks should get different energy from eating the two different breeds of fish. If two types of fish are in different directions, a shark may choose to follow one over the other by size or by speed or by the energy it gets from that breed or nearness or some combination of these factors.

Explore the ecosystem that you have developed by changing variables. At some point, you must find energy gain/loss, movement and reproduction rates that balance your model so that when run for a long time, neither the fish, the plankton nor the sharks go extinct.

Such a model should include sliders that allow the user to adjust the model parameters within reasonable ranges.

Finally, write up a description of observations you made from running your model and try to explain those observations.

Idea 2) Mod to the Game of Life:

NetLogo downloads with many very cool models. One of these is one of the earliest and simplest artificial life programs called The Game of Life. What is remarkable about this model is that using a "world" consisting of a simple, 2D grid and only 4 simple rules, the model exhibits many complex emergent, behaviors.

Open the model, read the info tab, run the model then read the info tab again.

Then start creating. You could try changing some of the rules, adding more rules (for example, use a larger neighborhood that includes neighbors a distance of 2 from the center). One cool extension is to port the existing model to NetLogo 3D. In addition to modifying the existing code, this would mean extending the rules to apply to 3D. For example, this set of rules works in 3D:

3D Rules:

Cubes with only 1 or less neighbors die, as if by loneliness.
If 5 cubs surround an empty cell, they breed and fill it.
If a cube has 8 or more neighbors, it dies from overcrowding.

Idea 3) Pick a different NetLogo or NetLogo 3D model to expand.