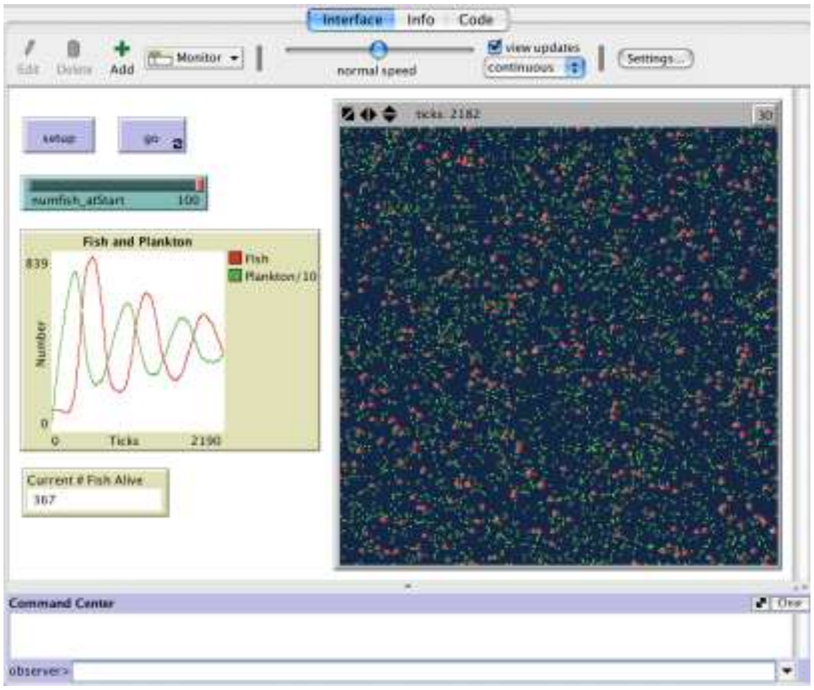
CS108L Computer Science for All
Module 6: Saving Nemo: An Ecosystem Model



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ticks: 2182

numfish_atStart 100

Current # Fish Alive 367

In this lab, you will be creating a model that represents a simple ecosystem. You have fish swimming around eating plankton and having fun! The fish die if they can't find enough plankton to eat. The fish have baby fish if they can eat enough food. Your basic ecosystem!

The Basic Setup:

Minimum Requirements

- Change the max-pxcor, and max-pycor to 100. Change patch size to 3. Set world to wrapping.
- Change world color to blue.
- For the fish:
  - Create a breed of agent.
  - Add a slider to adjust fish population.
  - Fish size is 1< size <= 5 and the same color.
  - Each fish has its own variable to monitor its energy (Initial energy ≠ 0).
  - Change the turtle's shape to a fish

- For the plankton:
    - Set 100 random patches in the world green.
- Fish Behavior:
    - With each tick, fish move forward 1 step and lose energy.
    - When fish are on a green patch, they eat the plankton, gain energy, and the patch turns back to blue.
    - Fish die when energy = 0.
    - Fish reproduce at a certain energy level.
    - Fish lose energy when they reproduce.
- Create a graph that monitors your population of fish and plankton over time.
- Create a monitor that records the number of fish alive

Module 6: Saving Nemo Grading Rubric (20 Points Total)		
Done	Points	Task

	2	A:
		• Submit a NetLogo source code with the file name: M1.*firstname*.*lastname*.nlogo.
		• The first few lines of your Code tab are comments including the following:
		`;Student’s Name:`
		`;School:`
		`;Teacher's Name:`
		`;Date:`
		• Initialize the procedures you have written (using comments).

	3	B: • In-line comments. • You program has separate procedures for fish eating, moving, reproducing and dying. You call each of these procedures in your “go” procedure. • The info tab describes the details of you model including a general description, how it works, how to use it and items from G below. See Coding Standards Guidelines for more information.
	2	C: • Your program is set up with the required world settings. • World’s patches are blue. • You start with 100 random green patches (for plankton) • You created a fish breed. • Fish are the same color. • Agents’ shape changed to fish. • A slider is used to manage fish population. • Fish are set to the appropriate size and energy is greater than 0.
	3	D: • Fish lose energy when they move.

		• Fish eat plankton and gain energy when they get to a green patch, turning the patch blue. • Fish die if they do not have enough energy and reproduce if they have enough energy.
	3	E: • Plankton patches turn blue when consumed. When random plankton are generated, they turn a random patch green.
	3	F: • You have a slider that inputs the number of fish in the model. • You have a graph that shows the number of fish and the plankton as the model progresses. • You have a monitor that displays the number of fish currently alive.
	4	G: • When your model is run, neither the fish nor the plankton die out completely. Rather, the populations of each either oscillate (cycle around a value) or stabilize. • Report in a tab on the google sheet (which can be reached from Module 6 web page) your above constants (which should be the same for all trials), your variables (‘plankton energy’ which is energy gained from eating plankton and ‘breeding energy’ which is the energy lost for breeding) and your result (‘fish currently alive’ at 10,000 ticks). • Report only the 3 best trials (highest number of fish still alive at 10,000 ticks, this must be greater than 0).