

CS108L Computer Science for All

Week 6: Computer Science Concepts

Assumptions: are what the modeler assumes when moving from the real world problem to a model. Assumptions are sometimes a simplification and sometimes a specification

Local Variable: A variable that can be used by any agent but only in the procedure or command block where it is declared

Agent Variable: A variable that can only be used by a specific agent

Turtle Variables: A turtle-specific variable. Each turtle has its **own** value for every turtle variable

Patch Variables: A patch-specific variable. Each patch has its **own** value for every patch variable

Link Variables: A link-specific variable. Each link has its **own** value for every link variable

Global Variable: A variable that can be used by any agent at any location in any procedure in the code. There is only one value of each global variable at any time

Slider: A NetLogo specific interface input device that sets a global variable to a number in a range of values to the maximum value.

Switch: A NetLogo specific interface input device that sets a global variable to a boolean value (On/Off).

Input Box: A NetLogo specific interface input device that sets a global variable to a string, number or color. The String can be a simple string or a command or reporter (checks syntax). The number can be any type of number. The color can be chosen from the NetLogo color table.

Monitor: A NetLogo specific interface output device that outputs the current value of a specific variable as the program is executed

Graph: A NetLogo specific interface output device that can output more than one variable at a time, drawing a line for each variable value, thus keeping a running history of the value of each variable. The variable output is updated as the program is executed.

Model: The program written that is the abstraction of the problem being evaluated. It captures the elements of the system and the behavior of the elements being modeled.

Simulation: Running the model developed to simulate the passage of time and exploring the behavior of the modeled system.

Deterministic simulation models: Provide single outputs for each set of inputs because no randomness is involved

Stochastic simulation models: Can produce different outputs for each set of inputs because randomness IS involved. You want to look at the probability distribution of possible outcomes.

Breeds: NetLogo allows the programmer to define different “Breeds” of Turtles. A breed has all the properties that turtle has in addition to breed specific and is a subset of Turtles

Populations: A group living things such as ants, bees, turtles, and people.

Population Dynamics: The characteristic and changes in a given population. Affected by birth, death, immigration and emigration

Feedback

- **Positive Feedback** – speed up or enhances population growth
- **Negative feedback** – slows down or decreases population growth

Random – something that is random has no pattern and is not predictable

Pseudo-Randomness – computers are by their natures deterministic, that is how they are designed. In order to generate random numbers on a computer, pseudo-randomness is used. Computers use algorithms to determine random numbers. The randomness is only as good as the algorithm used