Simulations with NetLogo: BehaviorSpace

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Resources for NetLogo

- Programming guide: http://ccl.northwestern.edu/netlogo/docs/programming.html
- User dictionary: http://ccl.northwestern.edu/netlogo/docs/dictionary.html
- Info on BehaviorSpace: http://ccl.northwestern.edu/netlogo/5.0/docs/behaviorspace.html

Review: Variables

- Global: typically these are shown on the GUI
  - Slider
  - Button
  - Switch
  - ...
- Local to a function (“set”)
- (...)-own: variables unique to each agent (default agent name is “turtles”

Review: functions

- We start these in the GUI:
  - "setup": initial conditions for agents
  - "go": Main function, simulation starts here
- to...[]...end: Defines functions that are called
- ask: For all agents picked at random, do
- if, ifelse ... []
- tick: increment timestep

Graphing Data

- "View updates"
- Monitor: current value of a variable
- Plot:
  - Choices: plot color, min/max, autoscale,...
  - Simulation stops with undefined values
- Output: record of outputs

BehaviorSpace

- When running simulations, especially MANY simulations, BehaviorSpace is VERY useful

- Features:
  - Write data to file
    - Table (machine readable)
    - Spreadsheet (human readable)
  - Parallelize (pay attention to race conditions)
  - Statistics of wide OR narrow behavior space

Example and Demonstration

Command Line Simulations

- Advantages:
  - Faster simulations
  - Control of headspace (how much memory you need)
  - Easy to implement via ssh

Command Line Simulations (cont.)

```
java -Xmx1024m \                                    [Heap Space]
  -Dfile.encoding=UTF-8 -cp NetLogo.jar \
                                                    [Don't Change]
    org.nlogo.headless.Main \  [Make Headless]
--model Fire.nlogo \             [Model]
    --experiment experiment1 \ [Experiment]
 --table -                                  [Output (default)]
```