Introduction to Agent-Based Modeling

Continuing Holfield and McCoy Model

A Practical Guide to Building Models in Netlogo

Loops of Various Sorts

- while is very useful: repeat a bit of code based on a parameter
- can simulate the "for loop" in real computer languages
- even nested "for loops" are possible, but they can be tricky

```
let index 0
while [index < population] [
  ask one-of patches [sprout 1 [] ]
  set index index + 1
]
```

```
ask turtles [
  while [any? other-turtles-here] [
    rt random 90 - 45
    fd random-float 2
  ]
]
```

- repeat is similar to while, but with a fixed number

```
repeat iterations [
  ask one-of turtles [
    rt random 90 - 45
    fd random-float 2
    set color color + 1
  ]
]
```

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Loops of Various Sorts

- foreach and map work on lists only.
- Lists can be lists of agents, but how to use them is wack!
- Multiple lists must be of equal length, items are paired.

```
(foreach [1 2 3] [2 4 6]
   [ show word "the sum is: " (?1 + ?2) ])
=> "the sum is: 3"
=> "the sum is: 6"
=> "the sum is: 9"
(foreach list (turtle 1) (turtle 2) [3 4]
  [ ask ?1 [ fd ?2 ] ])
;; turtle 1 moves forward 3 patches
;; turtle 2 moves forward 4 patches
```

- foreach outputs commands, map outputs lists

```
show map [round ?] [1.1 2.2 2.7]
=> [1 2 3]
show map [? * ?] [1 2 3]
=> [1 4 9]
```

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Loops of Various Sorts

- Do something every (parameter) time periods (use ticks).

```
if time mod time-per-round = 0
  [ plot-utility-graph ]
```

- Stop the model if some condition is true.

```
if not any? banks with [risky? = true] [stop]
```

- See the Lists entry in Netlogo's Programming Guide for information on sorting, adding to, getting an item, removing duplicates from, etc. lists to loop through.

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Interaction with Models

- Mouse interaction: see the following Code Examples
  - Mouse Example
  - Mouse Recording Example
  - Mouse Drag One Example
  - Mouse Drag Multiple Example

- Sound Interaction: see the Sound folder of Code Examples

- See Progammer Guide for
  - Inputing a file (also Grand Canyon model)
  - Outputing a file
  - Recording a movie (also Movie Example)