10-5 – 10-19 – Controlling Entities

* If command
  + Block of codes are within [ ]
  + We can write if within if
  + Random 100 < 5
  + Ticks >= 20
  + Questions:
    - Can-move? Distance – can the agents keep moving the distance
    - Any? Condition – is there any agent satisfying the condition
    - All? Condition – are all the agents satisfying the condition
  + Halting Condition
    - How the code is stopped
* Using variables with If
  + Variables are names that are associated with a value
    - Variables vary: its value may change
    - Constants: names associated to the same value
      * Constants could be a universal constant such as pi
      * They could also be a constant within NetLogo
  + Variables and constants can be associated to certain types of values
    - Integers – for calculations
      * 79
    - Floating Points – for calculations
      * 17.158
    - Booleans – for conditions
      * True or False
    - Strings – for names
      * “Hello”
  + Different types support different operations
    - Integers and Floating points
      * Transform: + \* / -
      * Compare: < <= >= >
    - Booleans
      * Transform: or and
      * Compare: == !=
    - Strings
      * Transform: Concatenate
      * Compare: == !=
  + Variable commands
    - Integers
      * NetLogo completes it by assuming you want to **show** the result
      * Operators have a priority (PEMDAS)
      * Space matters, the command can fail without proper spacing
    - Strings
      * When you have typed a complete string, it shows up in brown
      * Operator overloading: the behavior of an operator changes based on the types you give it (Not done in NetLogo)
      * Use the **word** command to combine strings
      * Use **substring** to take from first number place to second number place - 1
* Where do variables come from
  + Variables are created for a purpose and die after serving. In between we can use them. That’s their scope.
    - Globals – general simulation parameters
    - Turtles-own – tracking agent characteristics
    - Patches-own – tracking cell characteristics
  + Variable are created for parts of the model. Is it a characteristic of a cell, agent, or world?
  + Set height 165 + random 30 – 15, Set weight 72 + random 70 – 35
  + The **let** keyword makes a local variable, the scope is limited to the block of code where it’s made
  + When using the GUI, it creates global variables
    - Slider – produces a number within the range set in the “slider” dialogue
    - Switch – produces a Boolean
    - Chooser – can produce any data type, depending on the list of values entered in the “chooser” dialogue
    - Input – can produce a number, string, or color, depending on the set data type given in “input” dialogue
* Randomness
  + Percent: (patches of choice / total patches) \* 100
  + Ifelse condition
    - [do if condition is satisfied]
    - [do if condition is not satisfied]
* Limitations
  + Many features of interest aren’t statistically independent
  + If you’re simulating a physical environment, spatial features may be related to other aspects too