Carnegie Mellon University
Computer Science Academy

CS1: Unit 7 Review

New Shapes

Arcs and Arrows

- An arc is part of an oval
- Arc(centerX, centerY, width, height, startAngle, sweepAngle) draws an Arc
- Angles:
    - Measured in degrees
    - 0 degrees heads straight up
    - 90 degrees heads straight right
    - Increase clockwise
- startAngle is where you start to draw the arc and the sweepAngle is how many degrees the arc goes around
- Circular arcs can be made by setting both its width and its height to the diameter of the circle (twice the radius)
- An arrow is a line with a triangular arrowhead at one or both ends
- Use a line and set the arrowStart property to True to draw an arrow head at the start of the line
    - Similarly, you can set arrowEnd to True to draw an arrowhead at the end of the line

Local Variables

Local Variables

- A variable is a name we can use to refer to a value
- Using = , we can set a variable / assign a value to it
- Global variables (globals) are variables defined in top-level code outside of functions
    - Use them sparingly and only for shapes needing to be changed when events occur
- Function parameters are the names of the values that are provided to the function when it is called
    - These are local variables (locals)
- Local variables can only be used in the function they are defined
- Helper variables are local variables that you add to your code to make it easier and clearer to write
    - Ex. If you are going to use a color for lots of shapes, you can make a local variable that stores the color and then reference it by its name wherever you need it
- Note: do not make local and global variables with the same name

For Loops

For Loops

- Looping with range() :
    - Ex. for i in range(n): will loop n times, starting at i = 0
    - We can use i (the looping variable) for more than just to keep track of the loop number
- Each time through the loop is called a pass
- Indent the lines that make up the loop body

- Code before or after the loop is only run once and is not indented
- We can use for loops inside functions like `onStep()`
- Looping with `group.children` :
    - Ex. `for child in group.children:` (the size of the group dictates how many times the loop runs)