Turtle Graphics

The **turtle** module implements a simple drawing tool based on the LOGO programming language, which was invented in the 1960's as a teaching tool for children. A “turtle” is like a turtle that can be controlled to move on a two-dimensional “screen” (window). Positions on a screen are indicated using Cartesian coordinates with the origin (0, 0) indicating the center and distances measured in pixels. Like a turtle, the turtle is either up or down. When down, it draws as it moves; when up, it does not draw anything. Some common commands:

- **turtle.up()**/**turtle.down()**: set the state of **turtle** to be up (not drawing)/down (drawing).
- **turtle.setheading(angle)**: set the direction **turtle** is facing to **angle** degrees (e.g., 0 for east, 90 for north, etc.).
- **turtle.showturtle()**/**turtle.hideturtle()**: show/do not show **turtle** (a cursor).
- **turtle.turtlesize(width)**: set the line thickness to **width** (a positive **int**).
- **turtle.color(s)**/**turtle.color(r, g, b)**: Set the color for drawing. The argument is a Tcl color string ('red', 'green', 'blue', etc.)/the arguments are three floating point numbers between 0.0 and 1.0 indicating the amounts of red, green, and blue, respectively. The default turtle color is 'black'.
- **turtle.forward(distance)**/**turtle.backward(distance)**: move **turtle** forward (in the direction it is facing)/backward (in the opposite direction) **distance** pixels. (A negative **distance** reverses the direction.)
- **turtle.left(angle)**/**turtle.right(angle)**: turn turtle **turtle** right/left by **angle** degrees.
- **turtle.goto(x, y)**: move **turtle** along a straight line to the coordinates (x, y).
- **turtle.circle(radius)**: draw a circle of the indicated radius, counterclockwise and tangent to the direction the turtle is facing.
- **turtle.clear()**: clear the screen.
- **turtle.beginfill()**, **turtle.endfill()**: To fill a shape, use **turtle.beginfill()** just before drawing the shape, draw the shape, and use **turtle.endfill()** right after drawing the shape. The shape drawn between the two fill commands will be filled with the current color.
- **turtle.bye()**: close the drawing screen window. (Does not work properly with current MAC Anaconda distribution.)