CS 146 Fall 2025 – Quiz 2 "Cheat Sheet"

Numeric Operators

+, -, /, *, **: Addition, subtraction, division, multiplication, exponentiation
//: Floor division: Round division result down to nearest whole number
%: Modulus: Evaluate to remainder of division

- Range

range(stop): Equivalent to range(0, stop, 1)
range(start, stop[, step]): Create sequence of integers from inclusive **start** to exclusive **stop** by **step**

Precedence (equal precedence evaluated left-to-right):

parentheses > ** > negate > *,/,//,% > +,-

Strings

- The following functions are built-in
  len(string): Returns the number of characters in the string
  int(string), float(string): Converts numeric string to int or float
  str(object): Converts object, e.g. int or float, to a string
- String operators
  string1 + string2: Returns a new string that is the concatenation of string1 and string2
  string * int: Returns a new string that is string repeated int times

Modules

- **turtle** module
  forward(dist), backward(dist): Move the turtle forward/backward by the length `dist`. Doesn't change heading.
  right(angle) left(angle): Turn the turtle right/left by `angle` (in degrees)
  goto(x, y): Move turtle to position `x, y`
  setheading(angle): Set the turtles heading to angle
  circle(radius): Draw a circle with specified `radius`; the center is `radius` above the starting position
  dot(size): Draw a filled circle with diameter `size` centered on current position of the turtle
  penup(): Pull the pen up – no drawing when moving
  pendown(): Put the pen down – drawing when moving
  fillcolor(color): Change the fill color to `color`, where `color` is a string
  begin_fill(), end_fill(): Start and end filling shapes with fill color
- **random** module
  randint(a, b): Return a random integer `N` such that `a ≤ N ≤ b`
  uniform(a, b): Return a random floating point number `N` such that `a ≤ N ≤ b`
- **math** module
  sqrt(num): Return the square root of num
  pow(x, y): Return x to the power of y (i.e. `x ** y`)