

Outline for October 21, 2024

Reading: §4.5

Due: Homework 2, due October 30, 2023

1. Lists as parameters: can change list elements in function and they are changed in caller [*args2.py*]
2. More on parameters: named arguments and variable number of arguments [*args3.py*]
3. Recursion
 - (a) n factorial [*nfact.py*]
4. Thinking recursively [*recfun.py*]
 - (a) First: think of the recursive case (write the problem in terms of something involving a smaller instance of the problem)
 - (b) Next: think of base case (when to stop)
 - (c) Example: Find the length of a string
 - (d) Example: Does the string only have alphabetic characters in it?
 - (e) Example: Find the maximum element of a list
 - (f) Example: Construct a string from a list of strings
 - (g) Example: Reverse a string
5. Recursion
 - (a) Palindromes [*palindrome.py*]
 - (b) Fibonacci numbers [*rfib.py*]
 - (c) Sum of digits [*sumdigits.py*]
 - (d) Nested lists: is an item in a list? [*isinlist.py*]
 - (e) Tower of Hanoi [*hanoi.py*]
6. Using random numbers
 - (a) `import random`
 - (b) Problem: compute π by tossing darts at a unit square
 - (c) First build routine to simulate dart toss at unit square [*mc-1.py*]
 - (d) Then build routine to see if co-ordinates are in unit circle [*mc-2.py*]
 - (e) Then build routine to read in number of tosses [*mc-3.py*]
 - (f) Put it all together [*mc-4.py*]
 - (g) Graphics! [*mc-5.py*]