Lec 11 Chapter 20: Recursion

Nov. 22, 2025

HW

↳ PC 17-1, #70 Climbing Stairs (LeetCode)

- recursive: call itself
- base case
- recursive case
  - ↳ recursive calls stop when base case reached
- when recursion called, new copy of that fxn is called.
  - ↳ when recursion fxn finishes executing, returns to the part of the program that made the initial call.
- Direct
- Indirect
  - ↳ fxn A calls B which calls A.
  - ↳ fxn A calls B which calls... which calls A.
    - ↳ other fxns
- exit and base case are the same thing
- 20-3
- Greatest Common Denominator (gcd)
  - ↳ Euclid's algorithm
    - ↳ else return gcd(y, x % y)
- Fibonacci sequence
  - ↳ fib(n) = fib(n-1) + fib(n-2);
  - ↳ base cases: n <= 0, n == 1
- Recursive Linked List Operations
  - ↳ can traverse list in a reverse order
  - ↳ countNodes, a private member fxn
  - ↳ showReverse(nodePtr->next)
    nodePtr->value
- Binary Search
  - ↳ will not work if not in ascending order
  - ↳ binary search is a recursive fxn
- The Towers of Hanoi
  - ↳ English algorithm (pseudo-code)
  - ↳ dynamic memory is your scratchpad?

- 20-10* * Read Rumi, Shang
- The Quick Sort Algo
  - precursor to binary search is it must be sorted
- Exhaustive and Enum Algo*
- Recursive vs. Iteration

HW
- PC 17-1
- Blast-off (20-1)
- Tower of Hanoi → 4 discs, 3 pegs (20-10)
- PC: 20-1
- Prime Number Recursion
- #70 Climbing Stairs (LeetCode) (optional extra credit)