

CompSci 6

Programming Design and Analysis

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Announcements

- Read for next time Chap Chap. 13.1-3
- Reading Quiz for next time

Recursion

- Method calls a clone of itself
- Solves a problem by solving smaller subproblems
- “looping” by recursive calls
 - CAUTION – don’t add a loop, it is implicit
- Example: see SumItUp.java
- Example: See Hanoi.java

Example: SumItUp

- Calculates and prints the sum of integers in an array
- Also prints the numbers
- For you todo: print the numbers in reverse using recursion
- Another Example: Towers of Hanoi
 - Multiple recursion
 - See Hanoi.java

Recursion (more)

- Watch out for infinite recursion
 - No way out, what happens?
 - Segmentation fault, out of memory
- Rules
 - Base case (way out) – no recursive call
 - Recursive call(s) – solve a smaller problem

Recursion vs Iteration Which method do you use?

- Iteration
 - Easier to define
 - Faster – recursion takes some overhead
- Recursion
 - Easier to define
 - Shorter code

Types of Recursion

- Tail recursion
 - One recursive call at the end of a method
 - Easy to replace with a loop
- Reverse something
 - One recursive call “before” process
- Multiple Recursion
 - More than one recursive call

Classwork

- Recursively access directories
- Use File class
 - `isDirectory()` – true if file is a directory
 - `Length()` – size of file