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