Announcements

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

• Method calls a clone of itself
• Solves a problem by solving smaller subproblems
• 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
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
List

• A group of elements not ordered (can have duplicates)
• ArrayList extends List
• Can get all the elements one by one in a collections loop
Classwork

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