Administrivia

• HW#3 due Thursday
  – There was a typo on the HW, talk to me if this is an issue
• Started grading midterms, hopefully back by Thursday
• Newcunix ➔ cunix this weekend

Agenda

• Radix sort
• Quicksort

Radix Sort

• Radix is the “base” of a system of numbers
• Very simple, fast algorithm
• Sort by digit, one at a time
  – Sort on the 1s digit
  – Sort on the 10s digit; keep relative order of equal 10s the same, i.e., go left-to-right on the 1s digit
  – Sort the 100s digit
  – Etc.
• Problem: where to store intermediate results?
• Can sort 100 numbers in 2 passes! ~ O(2n)
• But… that’s essentially O(n log n)!
• There’s no free lunch, but this works very well for specialized keys

QuickSort: Partition

• Relies on concept of partition
  – A number s.t. two groups are formed: those smaller than the number, and those larger than the number
  – “Pivot”
  – Walk from both edges
    • If left is smaller than pivot, walk left
    • If right is larger than pivot, walk right
    • Otherwise, swap the two
    • What if we cross?
  – Last element is the pivot?
• Code? p. 338

QuickSort: Recursion

• Given pivot, we:
  – Partition the array in two;
  – Quicksort the left “half”;
  – Quicksort the right “half”.
• And recurse!
• That’s it (p. 338)
  – Well, must be very, very careful
• Analysis?
  – Usually O(n log n), and in-memory
• But there are some problems…

**Next time**

- Finish Quicksort
- Start trees