

CS 363 Outline for Quiz 2

Use appendix A and exponent formulas.

Algorithm analysis

- Worst case analysis

- Average case analysis in simple, equally likely situations

- Idea of lower bounds applying to all algorithms in a class

- Lower bounds via decision trees

Growth order of functions:

- sequence of orders for common functions

- simplifying order expressions

- big and small Oh, theta, and omega

Recurrence relations:

- Master theorem! Be able to classify recurrence relations and use it!

- Creating recurrence relations $T(n) = f(n) + \text{terms involving } T$

- Distinguish non-recursive term $f(n)$ from recursive terms and from $T(n)$!

- Formulas for $T(n)$ as sum if $T(n) = T(n-1) + f(n)$

Emphasis from here on, using earlier basics:

Searching

- linear, binary

Sorting. For all: follow algorithm for small data sets, stable sorts

- Insertion sort algorithm, worst, best, average cases

- Selection Sort

- Quicksort,

 - initial partition algorithm,

 - stack issues, version with loop

 - worst case, best case, order of average case

- MergeSort

 - Analysis for $n = \text{power of } 2$

 - Lower bound for key comparison based search via decision tree

- Heapsort

 - Best, worst case behavior

- Radix sort

 - Order analysis

- Comparisons of all sorts (where each has advantages)

Idea of amortizing

- Array copying for stacks as example of amortizing