

## Simple average case time analysis

- Assumptions
  - Insert at end of heap
  - No overflow buckets for hash
    - Keep 80% occupancy
    - Inserts/deletes in balance
- Use analysis for relative costs
  - TOO CRUDE for “on the fly” cost estimates
- Parameters:
  - B** data pages in file
  - D** avg time to R/W page
  - R** records per page

Avg. time	Heap	Sorted	Hashed
Scan	BD	BD	1.25 BD
Search = (unique)	.5BD	$D \log_2 B$	D
Search = (multiple)	BD	$D(\log_2 B + \# \text{ extra matching pages})$	$D(1 + \# \text{ extra matching pages})$
Search range	BD	“	1.25 BD
Insert	2D	Search + D + BD	2D
Delete (have record location)	2D	2D+BD	2D