Priority Queues II

CSE 373
Data Structures & Algorithms
Ruth Anderson

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Today's Outline

- Announcements
 - Midterm #1, this Fri, Oct 19.
 - Assignment #3, due Thurs, Oct 25.
- Today's Topics:
 - Priority Queues
 - Binary Min Heap buildheap
 - D-Heaps

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2

Facts about Binary Min Heaps Observations:

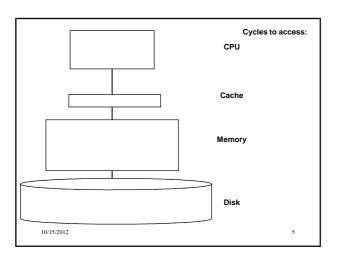
- finding a child/parent index is a multiply/divide by two
- operations jump widely through the heap
- each percolate step looks at only two new nodes
- inserts are at least as common as deleteMins

Realities:

- division/multiplication by *powers* of two are equally fast
- looking at only two new pieces of data: bad for cache!
- with huge data sets, disk accesses dominate 10/15/2012

3

Representing Complete Binary Trees in an Array From node i: From node i: I left child: right child: parent: implicit (array) implementation: A B C D E F G H I J K L 0 1 2 3 4 5 6 7 8 9 10 11 12 13



A Solution: d-Heaps • Each node has d children • Still representable by array • Good choices for d: - (choose a power of two for efficiency) - fit one set of children in a cache line - fit one set of children on a memory page/disk block

Operations on <i>d</i> -Heap	
• Insert : runtime =	
• deleteMin: runtime =	
10/15/2012 7	