CS367 Announcements
Wed, July 24th, 2013

- H6 due Mon 6pm
- P3 due Wed July, 31st 11:59pm

Last Time

- BST (cont.)
- Red-Black Trees (RBTs)

Today

- RBT (cont.)
- Priority Queues

Red-Black Trees (RBT)

Red-black tree properties:

root property: The root node must be black.

red property: Red nodes have only black children.

black property: Every path from the root to a leaf has the same number of black nodes.

Inserting into a Red-Black Tree

Goal: insert a key K into red-black tree T

Case: T is empty - add a new black node

Case: T is non-empty

- search for location to insert as done for BST
- add K as a red node
- restore red-black tree properties

Case 1: K's parent P is black - done

Case 2: K's parent P is red (red property violation)

a: P's sibling S is black or null - trinode restructure, done

b: P's sibling S is red - recolor, may need cascading restore

RBT Example

Starting with an empty RBT, show the RBT that results from inserting:

`7, 14, 18, 23, 1, 11, 20, 29, 25, 27`

Complexity of RBT Insert

Priority Queues

Operations

Min and Max Heaps

Implementing Heaps