

FirstPriority

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APCS2 pd08

HW48 -- Heap o'Trouble

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### **Adding to a Heap:**

- 1) Add the node to the bottom level of the heap, in the next available spot. If there is no available spot in the bottom level, create a new level.
- 2) Compare the node you added to its parent. If it is a min heap and the node is less than its parent, swap the parent with the added node. If it is a max heap and the node is greater than its parent, swap the parent with the added node. If the added node is in the right spot, STOP, you're done.
- 3) Repeat step 2 for every swap made.

### **Removing from a Heap (this is for the root of a heap):**

- 1) Remove the root from the heap and leave a hole.
- 2) Replace the hole with the furthest right node on the bottom level.
- 3) Compare the new root with its children. If it is a min heap and the new root is greater than its children, swap it with its smaller child. If it is a max heap and the new root is less than its children, swap it with its larger child. If it is in the right order, STOP, you're done.
- 4) Do step 3 until the invariants have been fulfilled.