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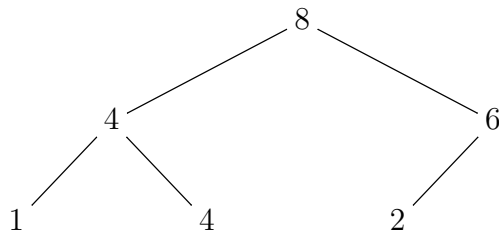
heap

Canonical name	Heap
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Related topic	BinaryTree
Related topic	BalancedTree
Related topic	HeapInsertionAlgorithm
Related topic	HeapRemovalAlgorithm
Related topic	Heapsort
Defines	heap property

Let \preceq be a total order on some set A . A *heap* is then a data structure for storing elements in A . A heap is a balanced binary tree, with the property that if y is a descendent of x in the heap, then $x \preceq y$ must hold. This property is often referred to as the *heap property*.

If \preceq is \leq , then the root of the heap always gives the smallest element of the heap, and if \preceq is \geq , then the root of the heap always gives the largest element of the heap. More generally, the root of the heap is some $a \in A$ such that $a \preceq x$ holds for all x in the heap.

For example, the following heap represents the multiset $\{1, 2, 4, 4, 6, 8\}$ for the total order \geq on \mathbb{Z} .



Due to the heap property, heaps have a very elegant application to the sorting problem. The heapsort is an in-place sorting algorithm centered entirely around a heap. Heaps are also used to implement priority queues.