12.3 Better implementation

Definition:
A **heap** must satisfy two properties, shape and order.
Shape property: A heap must be a **complete** tree (any non-last level is completely filled, and the last level is filled left-to-right).
Order property: Every parent is higher priority than its children.

There are two common types of heaps, maxHeap and minHeap. In a maxHeap, the parent is always greater than its children. In a minHeap, the parent is always smaller than its children.

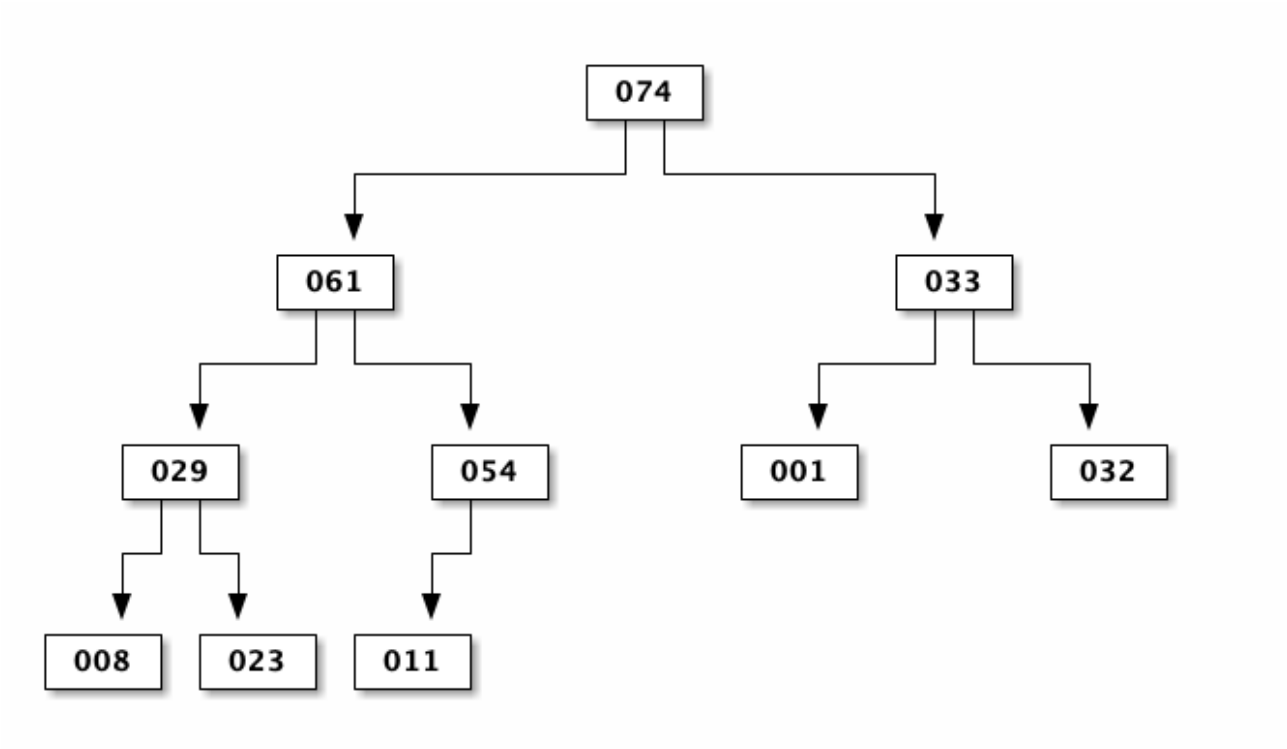

Figure 1: maxHeap example

Warning!
Heaps are **not** BSTs! Do not try to run normal traversals on heaps!

12.3.1 How to store data in heap

Because heaps are complete (no gaps), you can store heaps in an array.

1. First, skip index 0
2. Then, store the level-order traversal of the tree.