



THE UNIVERSITY OF VERMONT
COLLEGE OF ENGINEERING &
MATHEMATICAL SCIENCES

d-Heap

d-Heap

d-Heap is a generalization of binary heap. Or, thinking of it a little differently, binary heap is an instance of *d*-Heap with $d=2$. Thus, each node in a *d*-Heap can have up to *d* children.

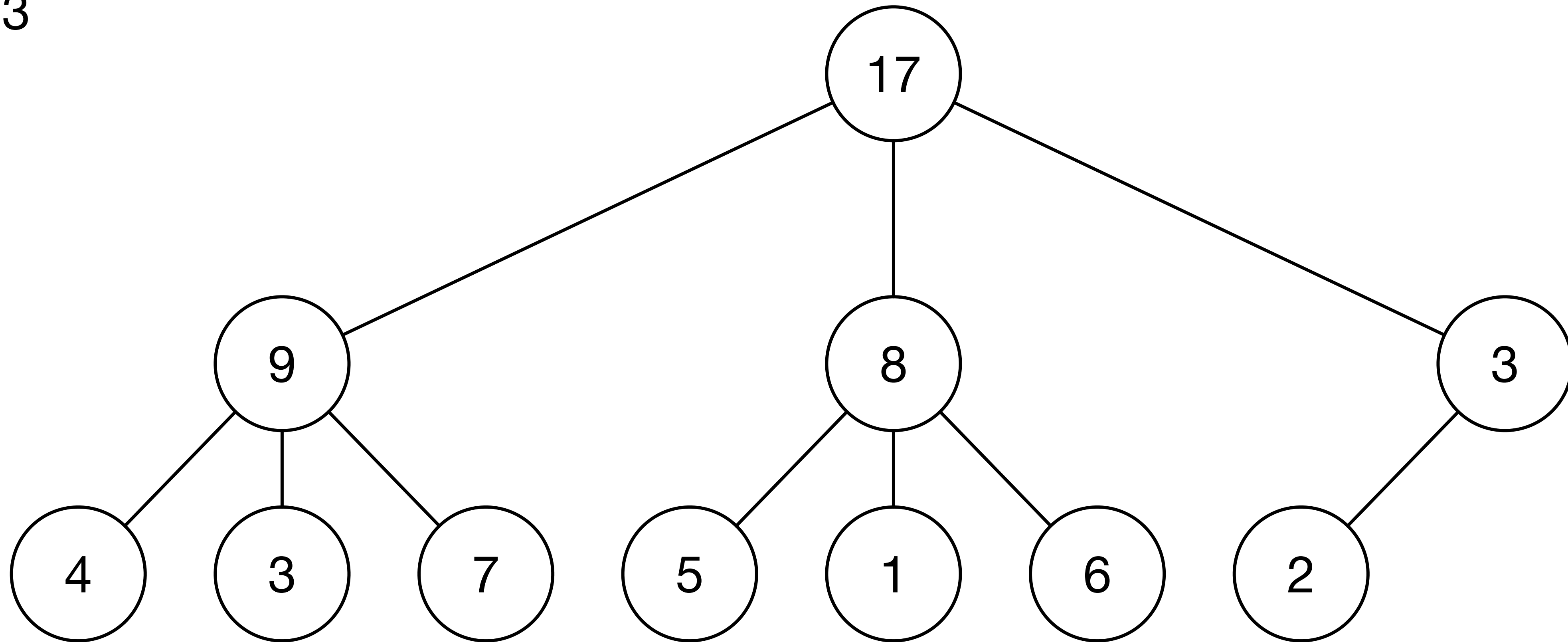
Some priority queue applications require a method for decreasing the priority of a node. In many of these instances, *d*-Heap can outperform binary heap.

d-Heaps also play nice with caching, which can improve performance when a heap is larger than a computer's cache memory.

We won't spend much time on *d*-Heaps, but you should know a little about them.

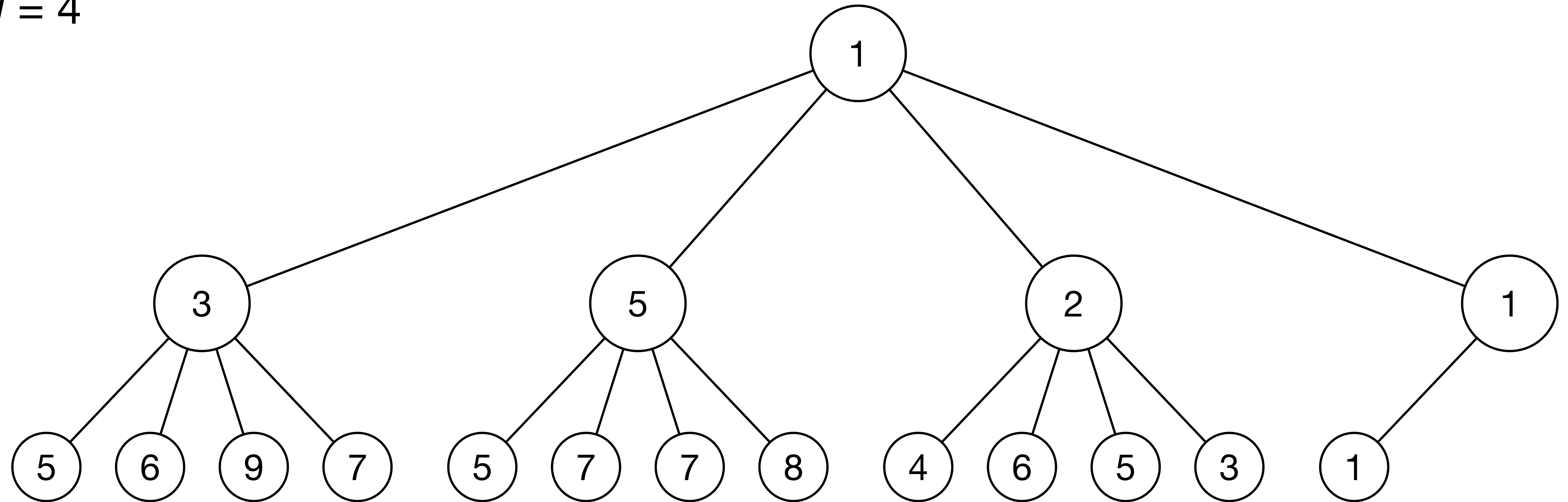
d-Heap

$d = 3$



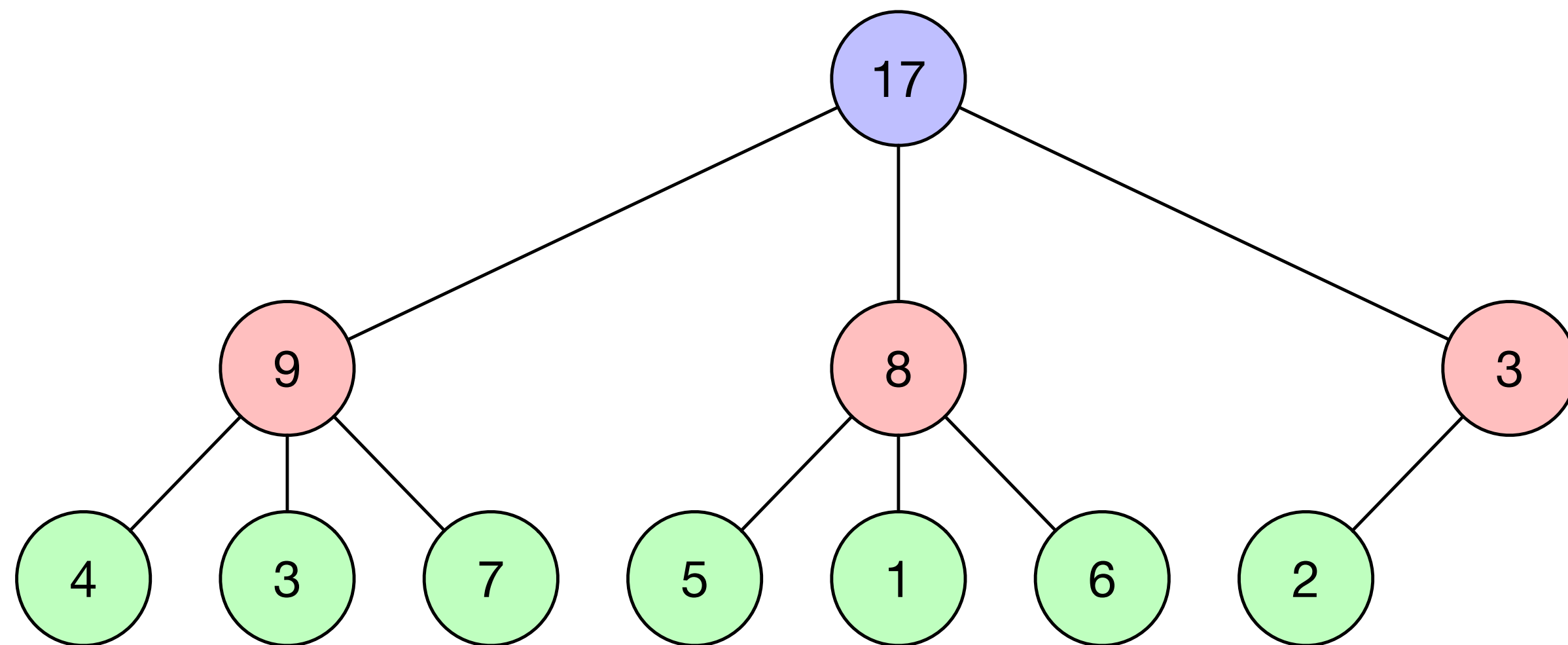
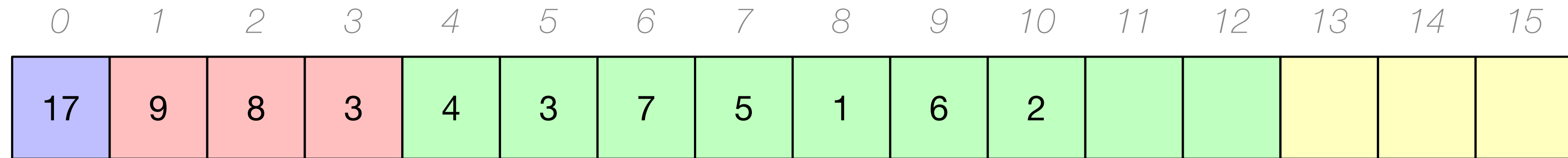
d-Heap

$d = 4$



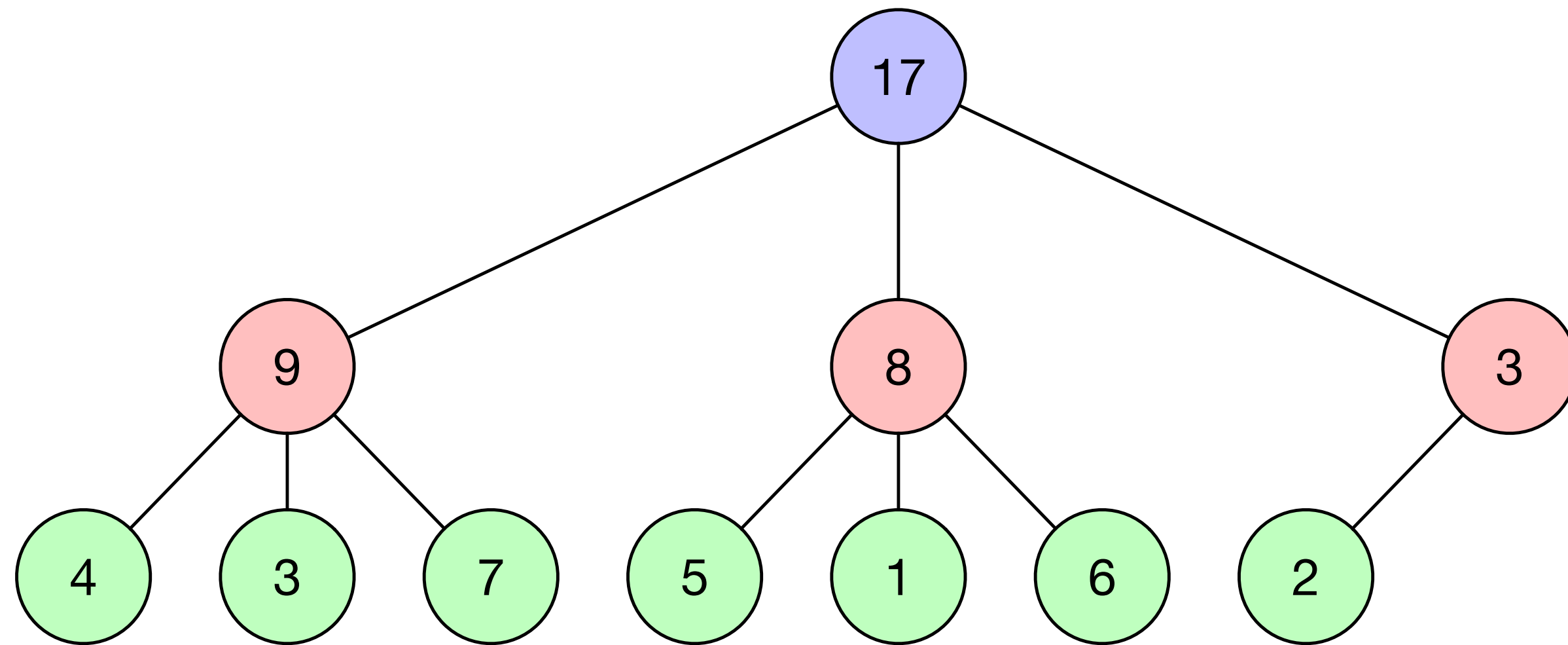
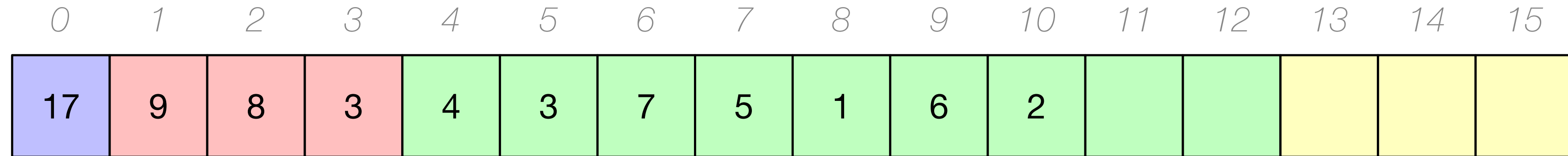
d-Heap

$d = 3$



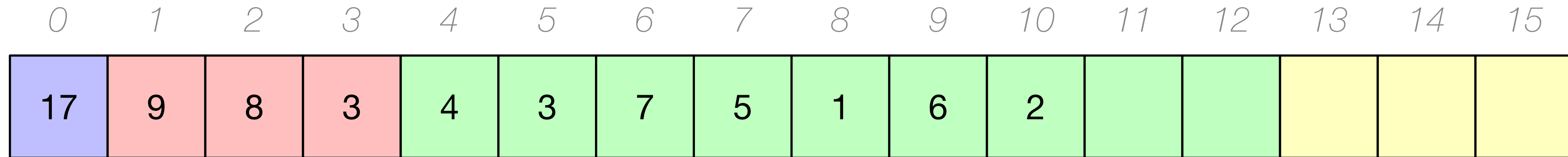
d-Heap

$d = 3$



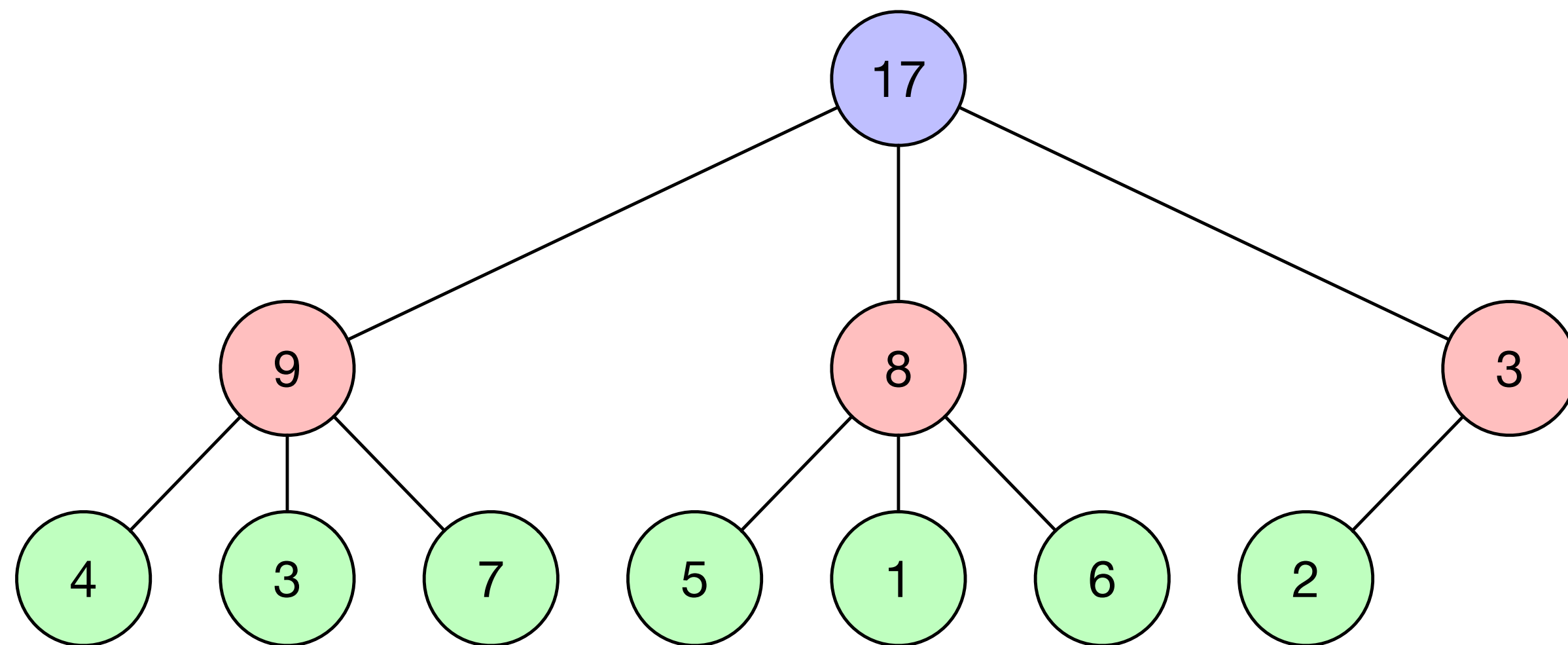
d-Heap

$d = 3$



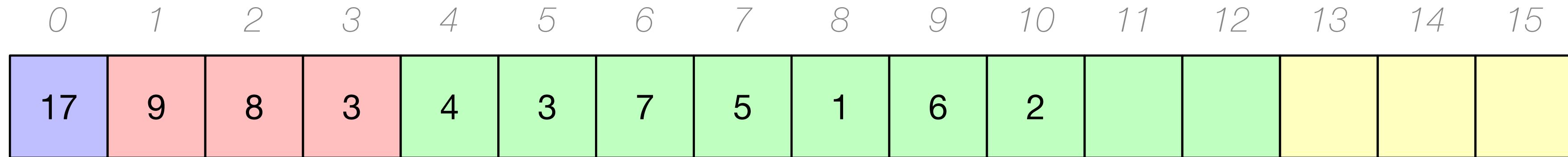
parent index =

$$\lfloor (i - 1) / d \rfloor$$

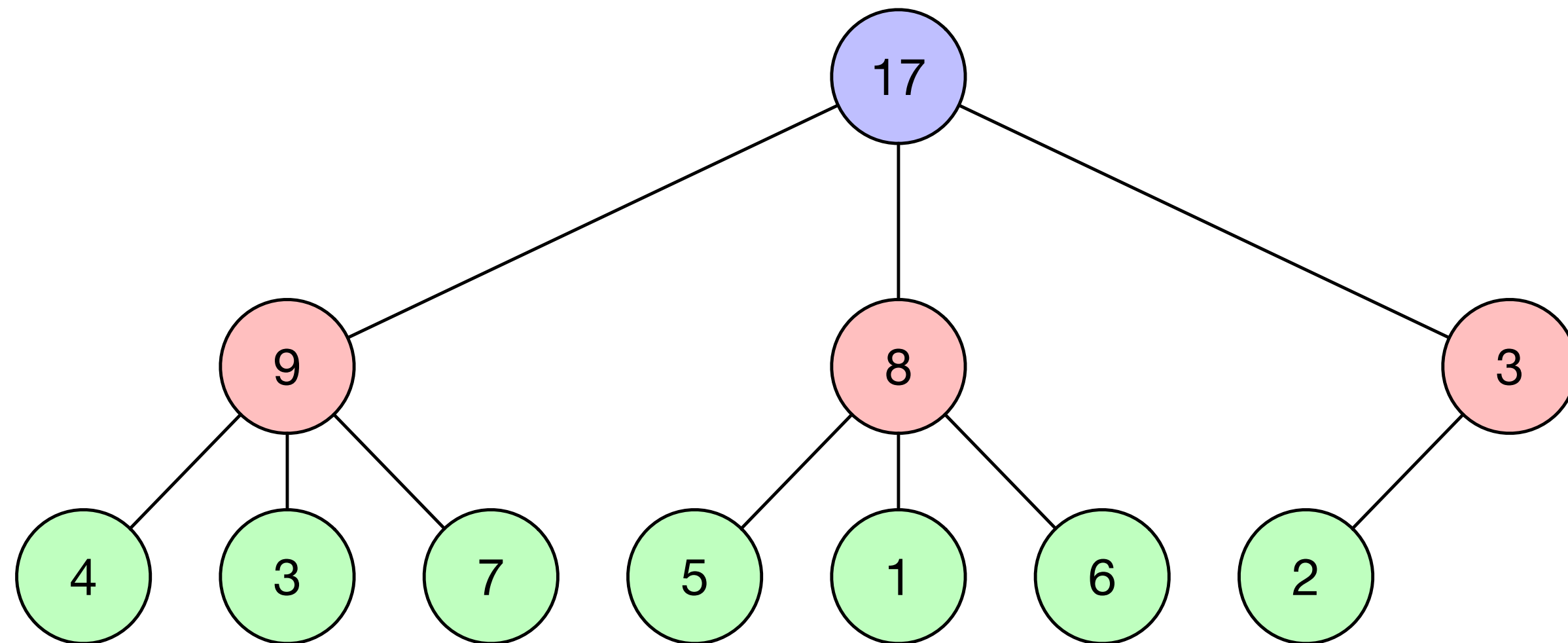


d-Heap

$d = 3$



children at
 $di + 1$
through
 $di + d$



d-Heap

$d = 3$

