

Quickcheck 05: Solutions

Name:

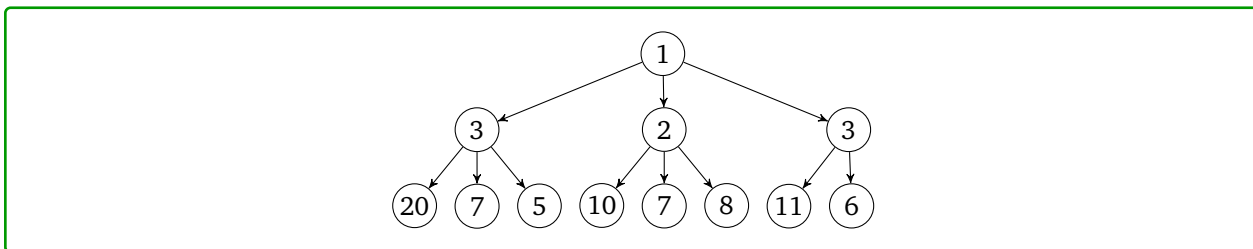
Consider the following sequence of numbers:

5, 20, 10, 6, 7, 3, 1, 2, 7, 8, 11, 3

- (a) Insert these numbers into a min-heap where each node has up to *three* children, instead of two. (So, instead of inserting into a binary heap, we're inserting into a ternary heap.)

Draw out the tree representation of your completed ternary heap.

Solution:



- (b) Draw out the array representation of the above tree. In your array representation, you should start at index 0 (not index 1).

Solution:

1, 3, 2, 3, 20, 7, 5, 10, 7, 8, 11, 6

- (c) Given a node at index i , write a formula to find the index of the parent.

Solution:

$$\text{parent}(i) = \left\lfloor \frac{i-1}{3} \right\rfloor$$

- (d) Given a node at index i , write a formula to find the j -th child. Assume that $0 \leq j < 3$.

Solution:

$$\text{child}(i, j) = 3i + j + 1$$