

QUIZ

What element is removed from a heap?

The element least like the other elements in the dataset.

The last element added to the dataset.

The "root" node, or first element in the array.



Correct! Heaps are concerned with the maximum or minimum value, which is the only element removed.

Heaps are often visualized as binary trees and implemented using a sequential data structure like an array.

False

True



Correct! The tree representation is helpful to visualize the operations inherent to a heap, but more efficient implementations exist in practice.

A heap is an effective solution for what kind of problem?

When you need to create a relationship of connections between data in your dataset.

When you need to keep a mapping of String values pointing to other values.

When you need to efficiently maintain a maximum or minimum value in a dataset.



Correct! Heaps allow us to retrieve and maintain a minimum or maximum value.

When you need to maintain an ordering of when elements entered the dataset.

In a min-heap, what is true of the first element in the array, or "root" element?

Every value below the "root" will be lesser than the value in the "root".

It is the maximum value.

It is the minimum value.



Correct! A min-heap will keep the minimum value at the root of the tree or as the first element in an array.

The root can only be replaced by a lesser value.

When removing the minimum or maximum value from a heap, what element **first** replaces the root before heapifying down?

The element with the mean value of the dataset.

The element at the bottom right of the tree, or last element in the array.



Correct! We first swap the root, or first, element with the bottom rightmost, or last element. Then we heapify down to restore the heap properties.

The element with the smallest value.

The element with the greatest value.

In a max-heap, what two qualities does the heap ensure?

The "root" or first element is an even number and every child is an odd number.

The "root" or first element is the largest value and every child is a lesser value than their parent.



Correct! A max-heap maintains easy access to the largest value.

The "root" or first element is the sum of both children, and every child is half of their parent's value.

The "root" or first element is the smallest value and every child is a greater value than their parent.

In a min-heap, what happens during the process of "heapifying up"?

While there is a child for an element and the child is lesser, the element swaps locations with the parent.

While there is a child for an element and the child is greater, the element swaps locations with the parent.

While there is a parent for an element and the parent is greater, the element swaps locations with the parent.



Correct! Heapifying up is one process which restores the heap's properties.

While there is a parent for an element and the parent is lesser, the element swaps locations with the parent.

In a max-heap, what happens during the process of "heapifying down"?

While there is a parent for an element and the parent is lesser, the element swaps locations with the parent.

While there is a child for an element and the child is greater, the element swaps locations with the child.



Correct! This process will ensure the greatest value moves up, which is important for the max-heap properties.

While there is a parent for an element and the parent is greater, the element swaps locations with the parent.

While there is a child for an element and the child is lesser, the element swaps locations with the child.