

# CS2023 - Data Structures and Algorithms

## In-class Lab Exercise - Week 8

May 2, 2023

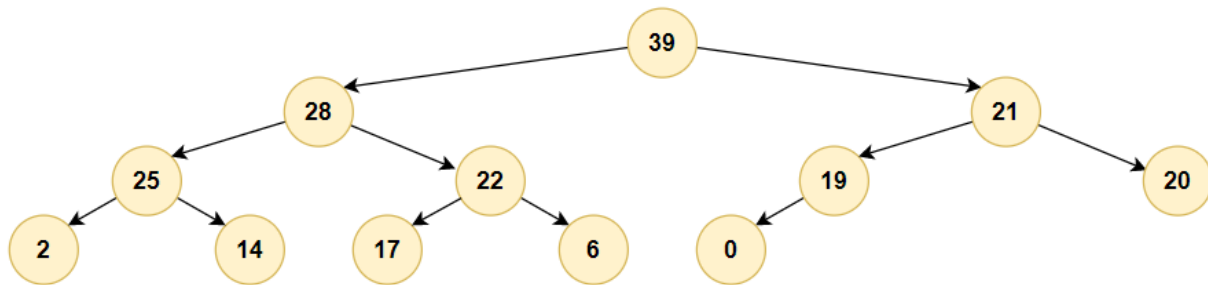
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### Terminal Output (Input is a random array)

```
Input array
0 17 20 14 22 21 39 2 25 28 6 19
Sorted array
0 2 6 14 17 19 20 21 22 25 28 39
```

### Sample Max Heap for the input



### Time complexity of Heap Sort

- Heapify operation -  $O(\log n)$  where  $n$  is the number of nodes in the subtree
- Build heap operation (perform heapify for all nodes) –  $O(n)$
- Extract top of the heap –  $O(\log n)$
- Extract top of the heap  $n$  times –  $O(n \log n)$

Total time complexity =  $O(n) + O(n \log n) = O(n \log n)$

Complete GitHub repository for code: <https://github.com/Anuki16/cs2023-data-structures-algorithms>