

1. Write the advantages and disadvantages of leftist heaps:

The leftist heap allows for concatenation at an efficient $O(\log n)$ (Traditional Binary heaps take $O(N)$); this is incredibly useful when combining multiple datasets. However, it is much more verbose to implement because it relies on the ranks to be computed at each insertion iteration.

2. Explain the advantages and disadvantages of implementing a leftist heap using a pointer-based implementation instead of an array-based implementation.

By using a pointer-based implementation calculating parent/children nodes is no longer constant time, making finding parent addresses much more difficult. However, since these trees do not have a specific fixed structure it would be much more difficult to maintain in an array. Another disadvantage of pointer-based is that it requires memory management i.e. avoiding memory leaks, linking nodes, etc.