Textbook:

4.5. Give an efficient algorithm to test whether a given array $A[1..n]$ is a heap. What is the time complexity of your algorithm?

4.9. How fast is it possible to find the minimum key in a max-heap of $n$ elements?

4.19. Give an algorithm to merge two heaps of the same size into one heap. What is the time complexity of your algorithm?

**k-merge.** Give an $O(n \lg k)$ time algorithm to merge $k$ sorted lists into one sorted list, where $n$ is the total number of elements in all the input lists.

**Dynamic median.** Design a data type that supports insert in logarithmic time, find-the-median in constant time, and remove-the-median in logarithmic time.