|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| A | B | O | o | Ω | ω | Θ |
| lgkn | **ne** | Yes | Yes | No | No | No |
| nk | **cn** | Yes | Yes | No | No | No |
|  | **nsin n** | No | No | No | No | No |
| 2n | **2n/2** | No | No | Yes | Yes | No |
| nlg c | **clg n** | Yes | No | Yes | No | Yes |
| lg(n!) | **lg(nn)** | Yes | No | Yes | No | Yes |

**a.** By master theorem, T(n) = T(n)=Θ(nlog3​4).

6.2

a. the difference is that in one case (where we use max heapify) we are coming from top to bottom, and every time we need to compare a node’s two children, and swap it with bigger one. Whereas in modified case, every time we are working with the last element added to the heap, so working from bottom to top, which causes the difference.

Example given [2,4,5]

In book’s algorithm the result is [5,4,2]

In modified version the result is [5,2,4]

b. MAX-HEAP-INSERT takes O(logn) time maximum, and we are calling it n times, so the runtime will be O(nlogn)

8.1.2