Q5

b)

The algorithm first calls sort on the array of nodes which takes `O(n log n)` time. The array is then split into two sub-arrays (through the median) of sizes `⌊n/2⌋` and `(n - ⌊n/2⌋ + 1)` which takes `O(n)` time. A recursive call is made on the sub-arrays with the relation `T(n) <= T(⌊n/2⌋) + T(n - ⌊n/2⌋ + 1) + O(n)` or simply `T(n) <= 2T(n/2) + O(n)` or `T(n) ∈ O(n log n)`. Therefore the runtime is `O(n log n)`.