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2.7

The extra space that is used in quicksort is needed because the “limits”, or breakpoints, of the sublists need to be stored for each sublist separate from the data in the array holding the information itself. In order to minimize this extra space we must combine the location for storing the limits and the data itself. One data structure that I would assume to use in this case is using a stack and pop the limits off the stack once they are used; storing the limits this way reduces the space complexity from O(n) when there are n limits in a recursive version to O(logn) when there are at most log(n) elements on the stack at any point. I would also consider using an optimal pivot selection (closest to the middle) like median of three (we went over this in the previous algorithms class) or random selection; this would be beneficial to prevent worst case pivot storage.