9 Sept 2022

Real-RAM model of computation

"the mathematical model of how computers work"

random access machine

I can access a random part of memory (with known location) in constant time.

we "store" real numbers.

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unsorted array

Quick Sort (A)

pick a random pivot $p \in A$

L ← run QuickSort on things $< p$ in A

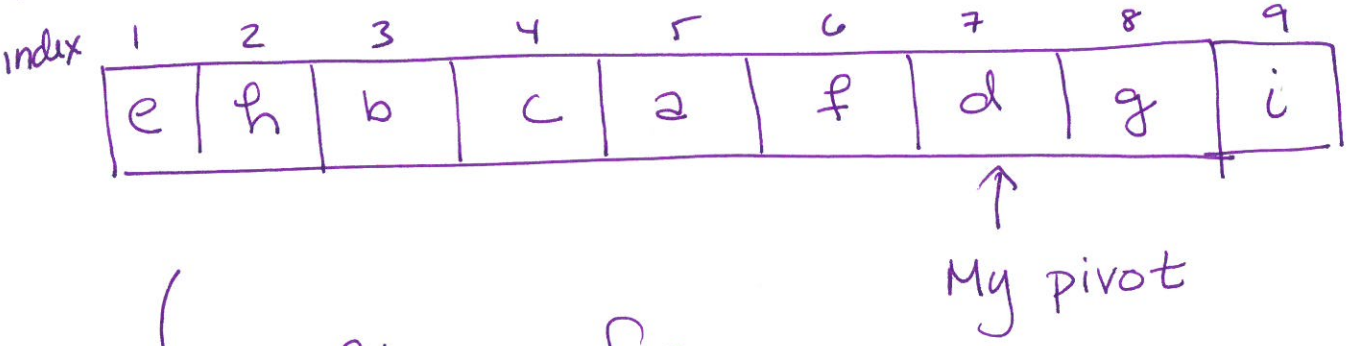
R ← run QuickSort on things $> p$ in A

return $L \,||\, \{p\} \,||\, R$

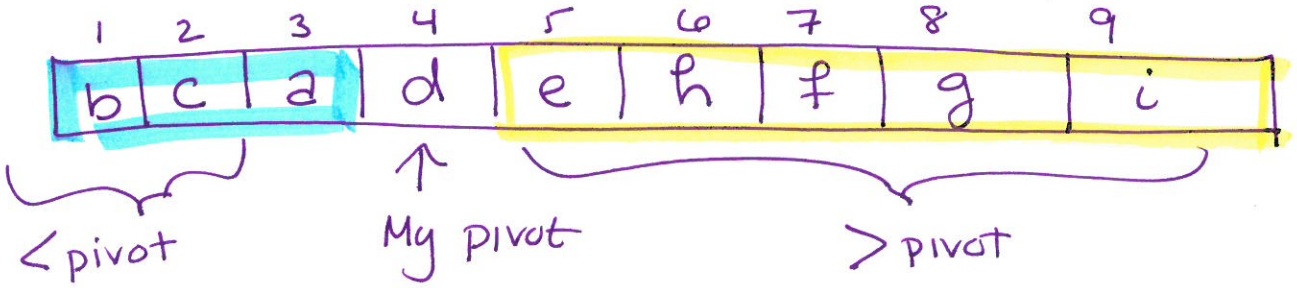
inplace sorting: just run the sorting algo on the input itself w/out creating aux. data structures (other than $\Theta(1)$ temp variables maybe)

EXERCISE: Pseudocode for inplace quicksort

example:



goal: prep for recursive calls



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