

Algorithms Homework 2

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1 Question 8.2-4

Describe an algorithm that, given n integers in the range 0 to k , preprocesses its input and then answers any query about how many of the n integers fall into a range $[a..b]$ in $\mathcal{O}(1)$ time. Your algorithm should use $\Theta(n + k)$ preprocessing time

2 Question 8.3-4

Show how to sort n integers in the range 0 to $n^3 - 1$ in $\mathcal{O}(n)$ time.

3 Question 8.4-2

Explain why the worst-case running time for bucket sort is $\Theta(n^2)$. What simple change to the algorithm preserves its linear average-case running time and makes its worst-case running time $\mathcal{O}(n \lg n)$?
