3.11. Programming Exercises

1. Devise an experiment to verify that the list index operator is $O(1)$

2. Devise an experiment to verify that get item and set item are $O(1)$ for dictionaries.

3. Devise an experiment that compares the performance of the `del` operator on lists and dictionaries.

4. Given a list of numbers in random order, write an algorithm that works in $O(n \log(n))$ to find the kth smallest number in the list.

5. Can you improve the algorithm from the previous problem to be linear? Explain.

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