Problem 521–2

You are given the task of reading in $n$ numbers and then printing them out in sorted order. Suppose you have access to a balanced-tree dictionary data structure, which supports each of the operations search, insert, delete, minimum, maximum, successor, and predecessor in $O(\log n)$ time.

• Explain how you can use this dictionary to sort in $O(n \log n)$ time using only the following abstract operations: minimum, successor, insert, search.

• Explain how you can use this dictionary to sort in $O(n \log n)$ time using only the following abstract operations: minimum, insert, delete, search.

• Explain how you can use this dictionary to sort in $O(n \log n)$ time using only the following abstract operations: insert and in-order traversal.