

Exercises for Lecture 10

April 9, 2024

Exercise 1 (Cormen 17.1-1). If the set of stack operations, in addition to PUSH, POP and MULTIPOP, included a MULTIPUSH operation, which pushes k items onto the stack, would the $O(1)$ bound on the amortized cost of stack operations continue to hold?

Exercise 2 (Cormen 11.2-3). Professor Marley hypothesizes that he can obtain substantial performance gains by modifying the chaining scheme to keep each list in sorted order. How does the professor's modification affect the running time for successful searches, unsuccessful searches, insertions, and deletions?

Exercise 3 (Cormen 17.1-3). Suppose we perform a sequence of n operations on a data structure in which the i -th operation costs i if i is an exact power of 2, and 1 otherwise. Use aggregate analysis to determine the amortized cost per operation.