

Design and Analysis of Algorithms

6.8 Implementing Queue with Stacks

Daniel Shannon

May 20th, 2022

7.8.2

Do an amortized running time analysis for a sequence of n enqueue/dequeue operations.

Hint: How many times, in total, can an element be pushed / popped onto some stack?

- Push: \$1+\$1 to bank
- Pop: \$0 to bank, take \$1 from the bank
- Push: \$1+\$1 to bank
- Pop: \$0 to bank, take \$1 from the bank

$O(\$2n)$

Solution

1. push onto A
2. popped from A
3. pushed onto B
4. popped from B

enqueue (1,2,3): \$3

dequeue (4): \$1

3N