COMPLEXITY ANALYSIS

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Step 1: Moving Elements to the Queue

This phase involves transferring each item from the stack to the queue. For a stack with (n) elements, this procedure requires (O(n)) time because it necessitates popping each element from the stack and then enqueuing it into the queue.

Step 2: Returning Elements to the Stack

In this phase, every item in the queue is removed and placed back into the stack. This step, like the first, consumes (O(n)) time for a queue with (n) elements, as each must be dequeued and then pushed onto the stack.

- Taking into account both phases, the total time complexity of the process is (O(n) + O(n) = O(2n)), which simplifies to (O(n)).

- The algorithm's space complexity is influenced by the requirements for the stack and queue storage. As these structures hold an equivalent number of items as the initial stack, the space complexity remains (O(n)).

In summary, this method exhibits a time complexity and a space complexity of (O(n)).