Interleave the First Half With the Second Half of the Queue [CodeStudio](https://www.codingninjas.com/studio/problems/interleave-the-first-half-of-the-queue-with-the-second-half_1169450?leftPanelTab=0)

**Approach 1: Function to interleave the elements of a queue using a stack-based approach.**

* **Algorithm**:
  + Initialize an empty stack of integers.
  + Calculate the size of the queue.
  + Push the first half of the elements from the queue into the stack.
  + Enqueue back the elements from the stack to the queue.
  + Dequeue the first half of the elements from the queue and enqueue them back.
  + Push the first half of the elements into the stack again.
  + Interleave the elements of the queue and the stack.
* **Time Complexity**: **O(n)**
  + **The function iterates through the queue three times, each involving O(n) operations, where 'n' is the number of elements in the queue.**
* **Space Complexity**: **O(n)**
  + **Additional space is used for the stack, which can have up to 'n' elements in the worst case.**

**Approach 2: Function to interleave the elements of a queue using a queue-based approach.**

* **Algorithm**:
  + Initialize two empty queues: **firstHalf** and **secondHalf**.
  + Calculate the size of the queue.
  + Enqueue the first half of the elements from the queue into **firstHalf**.
  + Enqueue the second half of the elements from the queue into **secondHalf**.
  + Interleave and enqueue elements from both **firstHalf** and **secondHalf** back into the original queue.
* **Time Complexity**: **O(n)**
  + **The function iterates through the queue and the two halves once, each involving O(n) operations, where 'n' is the number of elements in the queue.**
* **Space Complexity**: **O(n)**
  + **Additional space is used for the two queues, firstHalf and secondHalf, which together can store up to 'n' elements in the worst case.**