1352. Product of the Last K Numbers

Solved ●

Medium Topics Companies Hint

Design an algorithm that accepts a stream of integers and retrieves the product of the last `k` integers of the stream.

Implement the `ProductOfNumbers` class:

- `ProductOfNumbers()` Initializes the object with an empty stream.
- `void add(int num)` Appends the integer `num` to the stream.
- `int getProduct(int k)` Returns the product of the last `k` numbers in the current list. You can assume that always the current list has at least `k` numbers.

The test cases are generated so that, at any time, the product of any contiguous sequence of numbers will fit into a single 32-bit integer without overflowing.

Example:

> **Input**
> ["ProductOfNumbers","add","add","add","add","add","getProduct","getProduct","getProduct","add","getProduct"]
> [[],[3],[0],[2],[5],[4],[2],[3],[4],[8],[2]]
>
> **Output**
> [null,null,null,null,null,null,20,40,0,null,32]
>
> **Explanation**
> ProductOfNumbers productOfNumbers = new ProductOfNumbers();
> productOfNumbers.add(3); // [3]
> productOfNumbers.add(0); // [3,0]
> productOfNumbers.add(2); // [3,0,2]
> productOfNumbers.add(5); // [3,0,2,5]
> productOfNumbers.add(4); // [3,0,2,5,4]
> productOfNumbers.getProduct(2); // return 20. The product of the last 2 numbers is 5 * 4 = 20
> productOfNumbers.getProduct(3); // return 40. The product of the last 3 numbers is 2 * 5 * 4 = 40
> productOfNumbers.getProduct(4); // return 0. The product of the last 4 numbers is 0 * 2 * 5 * 4 = 0
> productOfNumbers.add(8); // [3,0,2,5,4,8]
> productOfNumbers.getProduct(2); // return 32. The product of the last 2 numbers is 4 * 8 = 32

Constraints:

- $0 <= num <= 100$
- $1 <= k <= 4 * 10^4$
- At most $4 * 10^4$ calls will be made to `add` and `getProduct`.
- The product of the stream at any point in time will fit in a **32-bit** integer.

Follow-up: Can you implement **both** `GetProduct` and `Add` to work in $O(1)$ time complexity instead of $O(k)$ time complexity?

Seen this question in a real interview before? 1/5

Yes No

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Hint 1

Hint 2

Discussion (222)