

1868. Product of Two Run-Length Encoded Arrays Premium

Solved ●

Medium  Topics  Companies  Hint

Run-length encoding is a compression algorithm that allows for an integer array `nums` with many segments of **consecutive repeated** numbers to be represented by a (generally smaller) 2D array `encoded`. Each `encoded[i] = [vali, freqi]` describes the *i*th segment of repeated numbers in `nums` where `vali` is the value that is repeated `freqi` times.

- For example, `nums = [1,1,1,2,2,2,2,2]` is represented by the **run-length encoded** array `encoded = [[1,3],[2,5]]`. Another way to read this is "three 1's followed by five 2's".

The **product** of two run-length encoded arrays `encoded1` and `encoded2` can be calculated using the following steps:

- Expand** both `encoded1` and `encoded2` into the full arrays `nums1` and `nums2` respectively.
- Create a new array `prodNums` of length `nums1.length` and set `prodNums[i] = nums1[i] * nums2[i]`.
- Compress** `prodNums` into a run-length encoded array and return it.

You are given two **run-length encoded** arrays `encoded1` and `encoded2` representing full arrays `nums1` and `nums2` respectively. Both `nums1` and `nums2` have the **same length**. Each `encoded1[i] = [vali, freqi]` describes the *i*th segment of `nums1`, and each `encoded2[j] = [valj, freqj]` describes the *j*th segment of `nums2`.

Return the **product** of `encoded1` and `encoded2`.

Note: Compression should be done such that the run-length encoded array has the **minimum** possible length.

Example 1:

Input: `encoded1 = [[1,3],[2,3]]`, `encoded2 = [[6,3],[3,3]]`

Output: `[[6,6]]`

Explanation: `encoded1` expands to `[1,1,1,2,2,2]` and `encoded2` expands to `[6,6,6,3,3,3]`.
`prodNums = [6,6,6,6,6,6]`, which is compressed into the run-length encoded array `[[6,6]]`.

Example 2:

Input: `encoded1 = [[1,3],[2,1],[3,2]]`, `encoded2 = [[2,3],[3,3]]`

Output: `[[2,3],[6,1],[9,2]]`

Explanation: `encoded1` expands to `[1,1,1,2,3,3]` and `encoded2` expands to `[2,2,2,3,3,3]`.
`prodNums = [2,2,2,6,9,9]`, which is compressed into the run-length encoded array `[[2,3],[6,1],[9,2]]`.

Constraints:

- $1 \leq \text{encoded1.length}, \text{encoded2.length} \leq 10^5$
- `encoded1[i].length == 2`
- `encoded2[j].length == 2`
- $1 \leq \text{val}_i, \text{freq}_i \leq 10^4$ for each `encoded1[i]`.
- $1 \leq \text{val}_j, \text{freq}_j \leq 10^4$ for each `encoded2[j]`.
- The full arrays that `encoded1` and `encoded2` represent are the same length.

Seen this question in a real interview before? 1/4

Yes No

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