CMPUT 275 - Tangible Computing
Morning Problem: Missing Multipliers

Description

Bob loves multiplying numbers! He wants to try something new though. Bob wants to multiply a list of numbers excluding a specific section of them.

To be specific, if Bob has a list of n integers, he wants to know for each integer a_i in his list, what would be the product if he multiplied everything except for a_i and the numbers within m spaces of a_i.

For example, take the array [1, 2, 3, 4, 5], if $m = 1$ the output would be [60, 20, 5, 2, 6], $3 * 4 * 5 = 60$, $4 * 5 = 20$, $1 * 5 = 5$, $1 * 2 = 2$, $1 * 2 * 3 = 6$.

Input

On the first line of input you will be given two space separated integers n, $(1 \leq n \leq 100,000)$, the amount of numbers in the array, and m, $(0 \leq m \leq n - 1)$, the amount of multipliers to be excluded from the product on either side of each a_i.

On the second line you will be given n space separated integers, such that for each a_i, $(-10 \leq a_i \leq 10)$ and $\prod_{i=0}^{n-1} |a_i| \leq 2^{63} - 1$.

Output

You are to output one line containing n space separated integers, each a_i should be the product of the array excluding itself and it's m neighbours to the left and right (if such neighbours exist), if all digits are excluded you are to put an answer of 0 (see sample 2).

Sample Input 1

```
3 0
3 -4 7
```

Sample Output 1

```
-28 21 -12
```

Explanation:

With $m = 0$ we only worry about the product without a_i, so we get -4 * 7 = -28, 3 * 7 = 21, and 3 * -4 = -12.

Sample Input 2

```
5 2
3 -2 7 0 4
```

Sample Output 2

```
0 4 0 3 -6
```

Explanation:

With $m = 2$ things get a bit more complicated, we get $0 * 4 = 0$, 4 because it is the only multiplier, 0 because there are no multipliers, 3 because it is the only multiplier, and $3 * -2 = -6$.