

# Problem J: Jaded Journey

Time limit: 1 second



HINDBAD'S life was transformed during the seven days he spent with Sindbad the Sailor. As he listened to the stories of Sindbad's seven voyages of distant seas and strange lands, an unfamiliar world unfolded before his eyes. Wanting to repay Sindbad for his generosity and companionship, Hindbad resolved to take him on one final journey, Sindbad's eighth voyage.



Painting of a baghlah, a large deep-sea traditional Arabic sailing vessel. CC BY-SA 4.0 by Xavier Romero-Frias on Wikimedia Commons

This final journey entails an  $n$  farsakh<sup>1</sup> long sea travel. As Hindbad was not nearly as financially endowed as his companion, the ship he hired for the voyage had some clear deficiencies. To make matters worse, Sindbad's reputation as the lone survivor of so many voyages had preceded him. The crew, convinced they were ferrying a walking ill omen, demanded unreasonable extra compensation in exchange for letting him sail with them.

The ship has two means of moving. The crew can row the ship with rudders, but for each farsakh they row they demand  $x$  additional food ration packs for their effort. When there is wind, the sail can be used to move instead. Using the sail to travel will not cost Hindbad anything, but since he hired a cheap ship, the sail breaks down frequently. He can ask the crew to fix the sail for  $r$  extra ration packs as often as necessary. Unfortunately, whenever the sail is repaired, it will break after  $d$  further farsakhs, regardless of how much it is used during this time. Initially, the sail is broken.

Given an accurate forecast on where there will be wind and where there will not, determine the minimum number of extra food ration packs Hindbad needs to load onto the ship.

## Input

The input consists of:

- One line with four integers  $n$ ,  $x$ ,  $r$ , and  $d$  ( $1 \leq d \leq n \leq 2 \cdot 10^5$ ,  $1 \leq x, r \leq 10^9$ ), the distance you need to travel, the required extra food packs for rowing one farsakh, the required food packs to repair the sail, and the distance until the sail breaks after repair.
- One line with  $n$  integers  $w_1, \dots, w_n$  ( $0 \leq w_i \leq 1$  for each  $i$ ), with  $w_i$  being 1 if there is wind to use the sail in the  $i$ th farsakh of the journey, and 0 otherwise.

## Output

Output the minimum extra food ration packs Hindbad needs to load onto the ship.

### Sample Input 1

```
3 2 1 3
0 0 0
```

### Sample Output 1

```
6
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Since there is no wind in this sample, the crew has to row all three farsakhs. Therefore the total extra food ration packs needed is  $3 \cdot x = 6$ .

<sup>1</sup>An old distance unit used in the Middle East, roughly equivalent to 6 km

Sample Input 2	Sample Output 2
4 3 5 2 1 0 1 1	11

Here it is optimal to let the crew row the first two farsakhs and then repair the sail for the last two farsakhs.

Sample Input 3	Sample Output 3
7 2 3 3 0 1 1 1 1 0 1	10