

1.

This question is designed to help you get a better understanding of *basic heap* operations.

There are 3 types of query:

- "1 v " - Add an element v to the heap.
- "2 v " - Delete the element v from the heap.
- "3" - Print the minimum of all the elements in the heap.

NOTE: It is guaranteed that the element to be deleted will be there in the heap. Also, at any instant, only distinct elements will be in the heap.

Input Format

The first line contains the number of queries, Q .

Each of the next Q lines contains one of the 3 types of query.

Constraints

$$1 \leq Q \leq 10^5$$

$$-10^9 \leq v \leq 10^9$$

Output Format

For each query of type 3, print the minimum value on a single line.

2.

Jesse loves cookies and wants the sweetness of some cookies to be greater than value k . To do this, two cookies with the least sweetness are repeatedly mixed. This creates a special combined cookie with:
 $\text{sweetness} = (1 \times \text{Least sweet cookie} + 2 \times \text{2nd least sweet cookie})$.

This occurs until all the cookies have a sweetness $\geq k$.

Given the sweetness of a number of cookies, determine the minimum number of operations required. If it is not possible, return -1 .

Example

$$k = 9$$

$$A = [2, 7, 3, 6, 4, 6]$$

The smallest values are 2, 3.

Remove them then return $2 + 2 \times 3 = 8$ to the array. Now $A = [8, 7, 6, 4, 6]$.

Remove 4, 6 and return $4 + 6 \times 2 = 16$ to the array. Now $A = [16, 8, 7, 6]$.

Remove 6, 7, return $6 + 2 \times 7 = 20$ and $A = [20, 16, 8, 7]$.

Finally, remove 8, 7 and return $7 + 2 \times 8 = 23$ to A . Now $A = [23, 20, 16]$.

All values are $\geq k = 9$ so the process stops after 4 iterations. Return 4.

Function Description

Complete the cookies function in the editor below.

cookies has the following parameters:

- $int k$: the threshold value
- $int A[n]$: an array of sweetness values

Returns

- int : the number of iterations required or -1

Input Format

The first line has two space-separated integers, n and k , the size of $A[]$ and the minimum required sweetness respectively.

The next line contains n space-separated integers, $A[i]$.

Constraints

$$1 \leq n \leq 10^6$$

$$0 \leq k \leq 10^9$$

$$0 \leq A[i] \leq 10^6$$