

Subset Sum



You are given a list of N positive integers, $A = \{a[1], a[2], \dots, a[N]\}$ and another integer S . You have to find whether there exists a non-empty subset of A whose sum is greater than or equal to S .

You have to print the size of minimal subset whose sum is greater than or equal to S . If there exists no such subset then print **-1** instead.

Input

First line will contain an integer, N , which is the size of list A . Second line contains N space separated integers, representing the elements of list A . In third line there is an integer, T , which represent the number of test cases to follow. Then follows T lines. Each one of them contains an single integer, S .

Output

For each test case, print the size of minimal subset whose sum is greater than or equal to S . If there's no such subset then print **-1**.

Constraints

$$1 \leq N \leq 10^5$$

$$1 \leq a[i] \leq 10^9$$

$$1 \leq T \leq 10^5$$

$$1 \leq S \leq 10^{15}$$

Note

Two subsets are different if there's an element $a[i]$ which exists in one of them and not in other. That is, for set $A = \{4, 4\}$ there are four possible subsets $\{\}$, $\{a[1]\}$, $\{a[2]\}$ and $\{a[1], a[2]\}$.

Sample Input

```
4
4 8 10 12
4
4
13
30
100
```

Sample Output

```
1
2
3
-1
```

Explanation

Sample Case #00: For $S = 4$, we can select any one element of set A as each of them is greater than or equal to 4.

Sample Case #01: There are many possible subsets of size 2 whose sum is not less than 13. They are $\{4, 10\}$, $\{4, 12\}$, $\{8, 10\}$, $\{8, 12\}$ and $\{10, 12\}$.

Sample Case #02: Subset $\{8, 10, 12\}$, with sum 30, is the only subset of size 3 whose sum is not less than $S = 30$.

Sample Case #03: Even after selecting all the elements of A , we can't exceed $S = 100$.