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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 350 points

Problem Statement

On the poker table, there are tea bags of N different flavors. The flavors are numbered from 1 through N , and there are A_i tea bags of flavor i ($1 \leq i \leq N$).

You will play a game using these tea bags. The game has a parameter called **difficulty** between 1 and $A_1 + \dots + A_N$, inclusive. A game of difficulty b proceeds as follows:

1. You declare an integer x . Here, it must satisfy $b \leq x \leq A_1 + \dots + A_N$.
2. The dealer chooses exactly x tea bags from among those on the table and gives them to you.
3. You check the flavors of the x tea bags you received, and choose b tea bags from them.
4. If all b tea bags you chose are of the same flavor, you win. Otherwise, you lose.

The dealer will do their best to make you lose.

You are given Q queries, so answer each of them. The j -th query is as follows:

- For a game of difficulty B_j , report the minimum integer x you must declare at the start to guarantee a win. If it is impossible to win, report -1 instead.

Constraints

- $1 \leq N \leq 3 \times 10^5$

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- $1 \leq Q \leq 3 \times 10^5$
- $1 \leq A_i \leq 10^6$ ($1 \leq i \leq N$)
- $1 \leq B_j \leq \min(10^6, A_1 + \dots + A_N)$ ($1 \leq j \leq Q$)
- All input values are integers.

Input

The input is given from Standard Input in the following format:

```
N Q
A1 ... AN
B1
⋮
BQ
```

Output

Print Q lines.

The j -th line ($1 \leq j \leq Q$) should contain the answer to the j -th query.

Sample Input 1

Copy

```
4 5
4 1 8 4
1
8
5
2
10
```

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Sample Output 1

Copy

```
1
17
14
5
-1
```

Copy

For the 1-st query, if you declare $x = 1$, then no matter which 1 bag the dealer chooses, you can satisfy the winning condition by choosing appropriate 1 bag among them. Since you cannot choose an integer x less than 1, the answer is 1.

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For the 2-nd query, if you declare $x = 17$, then no matter which 17 bags the dealer chooses, you can satisfy the winning condition by choosing appropriate 8 bags among them. Conversely, if $x < 17$, the dealer can choose bags to prevent your victory. Thus, the answer is 17.

For the 3-rd query, if you declare $x = 14$, then no matter which 14 bags the dealer chooses, you can satisfy the winning condition by choosing appropriate 5 bags among them. Conversely, if $x < 14$, the dealer can choose bags to prevent your victory. Thus, the answer is 14.

For the 4-th query, if you declare $x = 5$, then no matter which 5 bags the dealer chooses, you can satisfy the winning condition by choosing appropriate 2 bags among them. Conversely, if $x < 5$, the dealer can choose bags to prevent your victory. Thus, the answer is 5.

For the 5-th query, no matter what x you declare, the dealer can choose bags to prevent your victory. Thus, print -1 .

Sample Input 2

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```
5 3
13 13 13 13 2
5
12
13
```

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Sample Output 2

[Copy](#)

```
19
47
51
```

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