

Linked VERSE

Input file: **standard input**
Output file: **standard output**
Time limit: 7 seconds
Memory limit: 1024 megabytes

Helloooo! Can you hear me?

You are given a sequence $A = (A_1, A_2, \dots, A_N)$ of length N consisting of integers greater than or equal to -1 . Using this sequence and a parameter c , perform the following operations.

- Initially, set the variable $x := 0$.
- For $i = 1, 2, \dots, N$, repeat the following operation.
 - If $A_i = -1$, replace x with $x := \max(0, x - c)$.
 - Otherwise, replace x with $x := x + A_i$.

Answer Q questions of the following form.

- When the parameter $c = C_i$, find the maximum value attained by x over the entire sequence of operations.

Input

The first line contains N, Q in this order. ($1 \leq N, Q \leq 3 \times 10^5$)

The second line contains N integers A_i . ($-1 \leq A_i \leq 10^6$)

Each of the following Q lines contains the value of C_i for the i -th question. ($0 \leq C_i \leq 10^6$)

Output

Print Q lines.

On the i -th of these lines, print the answer to the i -th question.

Example

standard input	standard output
20 11	1700
50 100 50 100 0 200 -1 50 100 -1 200	1550
-1 200 0 200 -1 200 200 -1 200	1400
30	950
60	570
90	500
180	500
270	850
360	500
540	500
200	1850
400	
600	
0	

Note

We explain the first question of the first example input.

- In this question, the parameter is $c = 30$.
- Initially, the variable is $x = 0$.
- Since $A_1 = 50$, x is updated to $x = 0 + 50 = 50$.
- Since $A_2 = 100$, x is updated to $x = 50 + 100 = 150$.
- ...
- Since $A_6 = 200$, x is updated to $x = 300 + 200 = 500$.
- Since $A_7 = -1$, x is updated to $x = \max(0, 500 - 30) = 470$.
- ...
- Since $A_{19} = -1$, x is updated to $x = \max(0, 1530 - 30) = 1500$.
- Since $A_{20} = 200$, x is updated to $x = 1500 + 200 = 1700$.

Including the omitted parts, the maximum value attained by x over the entire sequence of operations is 1700.