Restaurant

Time limit: 1 sec

A popular restaurant has just opened in our town. This restaurant has exactly **N** seat, numbered 1 to N. This restaurant is also very sophisticated such that there are N chef, each exclusively attends to exactly one particular seat, i.e., the chef number i will serve exclusively at seat number i. These chefs have different styles, we know that if a customer is served by the chef number i, that customer will finish his/her meal in exactly $\mathbf{T_i}$ minutes.

At the beginning of the day, there are some customers waiting in a queue to be served. As soon as any seat is available at time X, the customer at the front of the queue will rush in to the first available chef. Assume that that customer is seated at the seat number i, the customer will finished the meal at time $X + T_i$ and the customer at the front of the queue at that time will immediately rush in to that seat as well.

This restaurant is very popular such that there are very large number of customer. However, their number of chef is not that many. Hence, each customer hast to wait for a very long time. Some customers want to visit somewhere else and come back to the restaurant before their seating time. Your task is to calculate the time that these customers have to be seated, assuming that the restaurant open at time 0. Hence, the first N customer will be seated at time 0, the N+1 customer will be seated as soon as the fastest chef finished his/her first customer and so on.

Input

- The first line contains two integers **N,** and **A** ($1 \le N \le 1{,}000$ and $1 \le A \le 200$)
- The second line contains N integers, indicating T_i, starting from T_1 to T_N. ($1 \le T_i \le 1{,}000$)
- The third line contains A integers. These integers are $c_1 \ldots c_A$, each integer indicates the label of the customer that we want to know their seating time. ($1 \le c_i \le 10^{12}$)

Output

The output contains A lines. The i-th line indicates the time that the customer c_i is seated. Be noted that this value can be larger than 32 bit integer.

Example

Input	Output
3 5 2 2 5 4 5 6 30 123456789012	2 2 4 24 102880657508