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 **T_i** minutes.

At the beginning of the day, there are **M** customer 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 + Ti and the customer at the front of the queue at that time will immediately rush in to that seat as well.

Calculate the time that each customer is 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 the three integers **N** and **M, A** (1 <= N, M, A <= 1,000,000)
- The second line contains N integers, indicating T_i, starting from T_1 to T_N.

Output

The output contains M lines, each line indicates the time that the customer is served, start from the first customer in the queue to the last customer.

Example

Input	Output
3 10 1 3 4	0 0 0 1 2 3 3 4 4 5