Buy k get 1 free

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

You are at a shop with n items numbered $1, 2, \ldots n$. For each i, the price of the item number i equals C_i. There is an offer under which, if you buy any k items, you can get any other item for free, whose price does not exceed the cheapest of the k items. Please note that, the offer can be used any (including 0) number of times.

For each $m = 1, 2, \ldots n$, find the minimum amount that you need to pay in order to buy m items.

Input

The first line contains t ($1 \leq t \leq 10^5$), the number of test cases. Then, the testcases follow, each consisting of two lines:

- The first line of each testcase contains two space separated integers, n ($2 \leq n \leq 2 \cdot 10^5$) and $k (1 \leq k \leq n - 1)$.
- The next line contains n space separated integers, $C_1, C_2, \ldots C_n$, where $1 \leq C_i \leq 10^9$ for all i.

The sum of n over all testcases doesn't exceed $2 \cdot 10^5$.

Output

For each testcase, print a line containing n space separated integers, where the m^{th} of them equals the minimum amount that you need to pay in order to buy m items.

Example

standard input	standard output
2 5 1 4 1 6 10 2 3 2 1 1 1	1 2 5 8 15 1 2 2

Note

In the first testcase, $k = 1$ and there are 5 items with costs $[4, 1, 6, 10, 2]$. Consider $m = 4$. The optimal solution to buy 4 items is to buy the fifth item(of cost 2) and get the second item(of cost $1 \leq 2$) free with it, and then buy the third item(of cost 6) and get the first item(of cost $4 \leq 6$) free with it. Hence, the total amount equals $6 + 2 = 8$.