Problem AddK

Input file	`stdin`
Output file	`stdout`

You are given an array A of N integers $A_1, \ldots, A_N$ and an integer K. You must process Q queries of the following two types:

- $1\ i_1\ i_2\ \ldots\ i_K$: you must circularly permute $A_{i_1}, \ldots, A_{i_K}$ to the left. Thus the new values of elements $A_{i_1}, A_{i_2}, \ldots, A_{i_{K-1}}, A_{i_K}$ will be $A_{i_2}, A_{i_3}, \ldots, A_{i_K}, A_{i_1}$. Note that $i_1, \ldots, i_k$ are distinct and not necessarily in increasing order.
- $2\ l\ r\ m$: you must sum the elements of all continuous subsequences with length m from the sequence $A_l, A_{l+1}, \ldots, A_{r-1}, A_r$. Note that an element that appears in multiple subsequences must be added multiple times.

Input data

The first line of the input contains two integers, N and K. The second line contains N integers: the elements of array A. The third line contains an integer Q, the number of queries, and next Q lines consists of queries, which can be one of two types described above.

Output data

The output consists of the answer to the queries of type 2, every answer on a new line.

Restrictions

- $0 \leq A_i \leq 10^6$
- $1 \leq l \leq r \leq N$
- $1 \leq m \leq r - l + 1$

#	Points	Restrictions
1	36	$1 \leq N, Q \leq 10\,000, K = 1$
2	56	$10\,001 \leq N, Q \leq 100\,000, K = 1$
3	8	$1 \leq N, Q \leq 100\,000, 2 \leq K \leq 10$

Examples

Input file	Output file
8 3 7 2 5 1 9 3 4 6 3 2 2 7 4 1 2 5 8 2 2 7 3	52 50

Explanations

The first query is of type 2 and we must calculate the sum of elements of all continuous subsequences with length $m = 4$ from sequence $(2, 5, 1, 9, 3, 4)$. These subsequences are $(2, 5, 1, 9)$, $(5, 1, 9, 3)$, $(1, 9, 3, 4)$, and the sum of their elements is 52.

The second query is of type 1 and requires the circular permutation of elements from array A, situated at indexes $2, 5, 8$. So, the array A will become $(7, 9, 5, 1, 6, 3, 4, 2)$.

The third query is of type 2 and we must calculate the sum of elements of all continuous subsequences with length $m = 3$ from sequence $(9, 5, 1, 6, 3, 4)$. These subsequences are $(9, 5, 1)$, $(5, 1, 6)$, $(1, 6, 3)$, $(6, 3, 4)$, and the sum of their elements is 50.