Kevin and And

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	512 megabytes

Kevin has an integer sequence a of length n. At the same time, Kevin has m types of magic, where the i-th type of magic can be represented by an integer b_i.

Kevin can perform at most k (possibly zero) magic operations. In each operation, Kevin can do the following:

- Choose two indices i ($1 \le i \le n$) and j ($1 \le j \le m$), and then update a_i to a_i & b_j. Here, & denotes the *bitwise AND operation*.

Find the minimum possible sum of all numbers in the sequence a after performing at most k operations.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \le t \le 10^4$). The description of the test cases follows.

The first line of each test case contains three integers n, m, k ($1 \le n \le 10^5$, $1 \le m \le 10$, $0 \le k \le nm$) — the length of a, the number of types of magic, and the maximum number of operations.

The second line contains n integers $a_1, a_2, \ldots, a_n$ ($0 \le a_i < 2^{30}$).

The third line contains m integers $b_1, b_2, \ldots, b_m$ ($0 \le b_i < 2^{30}$).

It is guaranteed that the sum of n over all test cases does not exceed 10^5.

Output

For each test case, output one integer — the minimum possible sum of all numbers in the sequence a after performing at most k operations.

Example

standard input	standard output
5 1 3 2 7 5 6 3 2 3 2 5 6 5 6 3 10 2 5 3 1 4 1 5 9 2 6 5 3 7 8 5 1 0 1073741823 1073741823 1073741823 1073741823 1073741823 1073741823 1 1 0 0 0	1 3 11 5368709115 0

Note

In the first test case, one possible way could be:

- Update a_1 to a_1 & b_1. The sequence will become $[5]$.
- Update a_1 to a_1 & b_3. The sequence will become $[1]$.

In the second test case, one possible way could be:

- Update a_1 to a_1 & b_3. The sequence will become $[1, 6]$.
- Update a_2 to a_2 & b_3. The sequence will become $[1, 2]$.