Telepathy

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	1024 megabytes

This is a multi-pass problem.

Alice and Bob are performing a telepathy trick for Christina. Christina chooses a subset $S \subset \{1, 2, \ldots, n\}$ such that $|S| < \frac{n}{2}$. Then, Alice adds a single integer x to this subset, such that $x \in \{1, 2, \ldots, n\}$ and $x \notin S$. Bob is only given the resulting set after Alice's addition and needs to deduce the exact integer Alice added.

Interaction Protocol

Your solution is executed twice on each test. In the first run, your solution acts as Alice. In the second run, your solution acts as Bob.

There are multiple test cases in each run.

First Run

The first line of the input contains the string `Alice`. The second line contains an integer T ($1 \le T \le 5 \times 10^5$), indicating the number of test cases. For each test case:

The first line of input contains two integers n and k ($3 \le n \le 10^6$, $1 \le k < \frac{n}{2}$). The second line contains k distinct integers $a_1, a_2, \ldots, a_k$ ($1 \le a_i \le n$), indicating the subset chosen by Christina.

For each test case, your solution should output one line containing $(k+1)$ distinct integers $b_1, b_2, \ldots, b_{k+1}$ ($1 \le b_i \le n$), such that $\{a_1, a_2, \ldots, a_k\} \subset \{b_1, b_2, \ldots, b_{k+1}\}$.

Second Run

Your solution will be restarted for the second run.

The first line of the input contains the string `Bob`. The second line contains an integer T ($1 \le T \le 5 \times 10^5$), indicating the number of test cases. For each test case:

The first line of input contains two integers n and k ($3 \le n \le 10^6$, $1 \le k < \frac{n}{2}$). The second line contains $(k+1)$ distinct integers $b_1, b_2, \ldots, b_{k+1}$ ($1 \le b_i \le n$), which is exactly the set you output for this test case in the first run (possibly in a different order).

For each test case, your solution should output one line containing a single integer, indicating the integer you added in the first run.

Note that the order of test cases in the second run might be different from that in the first run. Your solution is considered correct if you correctly deduce the added integer for all test cases.

It is guaranteed that the sum of n over all test cases does not exceed 3×10^6.

Examples

standard input	standard output
Alice 2 7 3 3 1 5 5 1 2	5 6 1 3 3 2
Bob 2 5 1 3 2 7 3 3 5 1 6	3 6

Note

The example shows two runs of a certain solution on the sample test cases.

In the first run, for the first sample test case, Christina has chosen the subset $S = \{1, 3, 5\}$ (given as `3 1 5`) from $\{1, 2, \ldots, 7\}$, with $|S| = 3 < \frac{7}{2}$. Alice must add one extra integer not in S and output the resulting set of size 4. She chooses to add the integer 6, so she outputs the set $\{1, 3, 5, 6\}$ (in the order `5 6 1 3`).

In the second run, the second sample test case corresponds to the first sample test case in the first run. Bob receives $(n, k) = (7, 3)$ and the set $\{1, 3, 5, 6\}$ (given as `3 5 1 6`). Using the pre-agreed strategy between Alice and Bob, he can deduce that 6 is the added integer and outputs `6`.