Merging Timelines

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

"Who controls the past controls the future."

— George Orwell, '1984'

UCPC (Universe Consistency Preservation Committee), consisting of intelligent species all across the universe, has discovered that the universe is diverged into N timelines. Timeline i has an integer time a_i which is greater than or equal to 1 and less than or equal to N, and the time values are all different. Each timeline is stable for the time being, but can become unstable at any moment, and an unstable timeline can have adverse effects beyond what humanity can perceive. Since consequences are dire with the entire universe on the line, UCPC has come to the conclusion that the N timelines must be merged into one at the current time t.

Merging timelines is the process of combining two adjacent timelines into one, taking either the maximum or the minimum of their time values. For $1 \leq i < N$, timelines i and $i+1$ are considered adjacent. Merging timelines is an irreversible event on a cosmic scale and must be carried out under extreme care. There is thus a limit on how many times the timelines can be merged taking the maximum time and the minimum time, respectively. Under these constraints, determine if UCPC can successfully merge all timelines into one.

Input

The first line of input contains T, denoting the number of testcases. ($1 \leq T \leq 100\,000$)

The first line of input for each testcase contains N, denoting the number of timelines, t, denoting the current time, a, denoting the maximum number of timeline merges taking the minimum time, and b, denoting the maximum number of timeline merges taking the maximum time. ($2 \leq N \leq 500\,000$; $1 \leq t \leq N$; $0 \leq a, b < N$; $a + b \geq N - 1$)

The second line of input for each testcase contains N space-separated integers $A_1, A_2, \cdots, A_N$. A_i denotes the time on timeline i. Each A_i is an integer greater than or equal to 1 and less than or equal to N and pairwise distinct.

The sum of N over all testcases does not exceed $500\,000$.

Output

Print the answer for each testcase in order.

If it is impossible to merge the timelines under the given conditions, print `no` in the first line.

If it is possible, print `yes` in the first line, and in the second line, print a string S of length $N-1$ consisting only of `m` and `M`, and in the third line, print $N-1$ space-separated integers b_i.

S_i is `m` if the i-th merge is taking the minimum time, and `M` if it is taking the maximum time. b_i denotes that the i-th merge is performed between timelines b_i and $b_i + 1$. If there are multiple ways to merge satisfying the conditions, print any one of them.

Note that there are $N - i + 1$ timelines remaining before the i-th merge, and thus $1 \leq b_i \leq N - i$ must be satisfied.

Example

standard input	standard output
2 4 2 2 3 1 4 2 3 3 3 2 0 3 1 2	yes mMm 2 1 1 no