



Problem Signals

Input file	<code>stdin</code>
Output file	<code>stdout</code>

The International Computer College of Bucharest has a network of N computers linked in a circle. Computer i (for $1 \leq i < N$) is connected with computer $i + 1$ through link i . Computers N and 1 are also connected through link N .

Each computer has a security key comprising K bits of information, represented as a binary string of length K . Each link i also has a security threshold W_i . The two computers connected through this link can only communicate if their security keys differ in *exactly* W_i positions.

The system administrator has lost the security keys, and needs your help to generate new ones in such a way that communication can take place through every link.

Input data

The first line of the input contains T — the number of testcases to solve. The description of T testcases follows.

The first line of a testcase contains two space-separated integers N, K . The second line of a testcase contains N space-separated integers W_1, W_2, \dots, W_N .

Output data

Output the answers for the T testcases. The description of an answer for a testcase follows.

If there is no solution for a testcase, the first and only line of the output must contain the string NO. Otherwise, the first line of the output must contain the string YES, and lines 2 to $N + 1$ must contain a valid list of security keys. The security key for each computer i must be printed as a binary string without any spaces on the $(i + 1)$ th line.

Restrictions

- $1 \leq T \leq 100\,000$
- $2 \leq N$
- $2 \leq NK \leq 5\,000\,000$
- $0 \leq W_i \leq K$
- It is guaranteed that the sum of NK among all testcases doesn't exceed $5\,000\,000$.
- If you correctly determine whether or not a solution exists, yet you output incorrect security keys (but which are correctly formatted), then you will be awarded 50% of the points of the subtask.
- Let W_{\max} be the maximum value among all W_i 's.



#	Points	Restrictions
1	5	$T, N, K \leq 5$
2	2	$K = 1$
3	8	$K = 2$
4	32	$2W_{max} \leq K$
5	24	$N \leq 50\,000, K \leq 20$
6	29	No further restrictions.

Examples

Input file	Output file
3	YES
5 3	000
2 1 3 0 2	110
10 6	010
3 2 1 4 3 2 1 3 2 1	101
2 3	101
2 1	YES
	000000
	111000
	111110
	111111
	000011
	111011
	011111
	111111
	000111
	000001
	NO

Explanation

For the first testcase, the security key 000 differs in 2 bits/positions from 110, 110 differs in 1 bit from 010, 010 differs in 3 bits from 101, 101 differs in 0 bits from 101 and 101 differs in 2 bits from 000, satisfying all five security thresholds.

For the last testcase there isn't a way to choose security keys such that all conditions are met. Therefore, NO is printed.