Busy Beaver's Faulty Machine

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Deep in Busy Beaver's robotics lab sits an experimental Busy Beaver machine. Given a positive integer X written in base B, it attempts to produce two positive integers Y and Z such that $X + Y = Z$, and the base-B representations of Y and Z contain exactly the same multiset of digits.

The machine never produces leading zeroes and never outputs numbers with $2 \cdot 10^5$ or more digits. It has recently stopped functioning, so your task is to determine whether such Y and Z exist, and to output them if they do. You are given the digits of X in base B without leading zeroes.

Input

The first line contains a single integer T ($1 \le T \le 100$), the number of test cases.

Each test case consists of two lines. The first line of each test case contains two integers N and B ($1 \le N \le 10^5$; $2 \le B \le 10^5$).

The second line of each test case contains N integers $a_1, a_2, \ldots, a_N$ ($0 \le a_i \le B - 1$; $a_1 \neq 0$), representing the digits of X in base B:

$$X = a_1 B^{N-1} + a_2 B^{N-2} + \cdots + a_N.$$

The sum of N over all test cases does not exceed $2 \cdot 10^5$.

Output

For each test case, if no valid solution exists, output a single line containing `NO`.

Otherwise, output `YES` on the first line. On the second line output an integer M ($1 \le M \le 2 \cdot 10^5$), the number of digits in both Y and Z.

On the next line output M digits $p_1, p_2, \ldots, p_M$ ($0 \le p_i \le B - 1$; $p_1 \neq 0$), representing

$$Y = p_1 B^{M-1} + p_2 B^{M-2} + \cdots + p_M.$$

On the following line output M digits $q_1, q_2, \ldots, q_M$ ($0 \le q_i \le B - 1$; $q_1 \neq 0$), representing

$$Z = q_1 B^{M-1} + q_2 B^{M-2} + \cdots + q_M.$$

The digit sequences $(p_1, \ldots, p_M)$ and $(q_1, \ldots, q_M)$ must use exactly the same multiset of digits, and the integers they represent must satisfy $X + Y = Z$. You may print `YES` and `NO` in any mixture of uppercase and lowercase letters.

Example

standard input	standard output
3 2 10 3 6 4 5 1 4 3 4 5 12 4 8 8 3 1	YES 2 1 5 5 1 YES 4 1 4 3 2 3 4 2 1 NO

Note

In the first test case, with $B = 10$ and $X = 36$, a valid solution is $Y = 15$ and $Z = 51$, since $51 = 36 + 15$ and both numbers use the digits $\{1, 5\}$.

In the second test case, with $B = 5$ and X given by digits $(1, 4, 3, 4)_5$,

$$X = 1 \cdot 5^3 + 4 \cdot 5^2 + 3 \cdot 5^1 + 4 = 244.$$

One valid pair is

$$Y = (1, 4, 3, 2)_5 = 242, \qquad Z = (3, 4, 2, 1)_5 = 486,$$

which share the digit multiset $\{1, 2, 3, 4\}$ and satisfy $X + Y = Z$.