Novice Magician

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

HoshiYo the Fox is a magician who is new to the magic school. As a novice, he is not proficient in many kinds of magic, especially those about numbers.

One day, HoshiYo learns a kind of magic that can change the integers in an array of length 2^n. However, due to a lack of proficiency, he can only change half of the integers in the array each time he uses magic. Formally, let's denote the array as $a_0, a_1, \ldots, a_{2^n-1}$, the following action can be performed by using the magic once:

- Choose 2^{n-1} different integers in the array and an integer x (possibly negative), add x to one of them, add $x+2$ to another one of them, add $x+4$ to another one of them, ..., and add $x+2^n-2$ to the last remaining one. In other words, choose 2^{n-1} different indices ranging from 0 to 2^n-1 denoted by $p_0, p_1, \ldots, p_{2^{n-1}-1}$, and add $x+2i$ to a_{p_i} for each integer i within $0 \le i < 2^{n-1}$.

Initially, each integer in the array is 0. HoshiYo has an ideal array $b_0, b_1, \ldots, b_{2^n-1}$ in his mind. He wonders if he can get this ideal array by using magic at most 2^n times, i.e., to make $a_0 = b_0, a_1 = b_1, \ldots, a_{2^n-1} = b_{2^n-1}$.

Input

The first line contains an integer n ($1 \le n \le 11$), indicating that the length of the array is 2^n.

The second line contains 2^n integers $b_0, b_1, \ldots, b_{2^n-1}$ ($0 \le b_i \le 10^5$), indicating the ideal array.

Output

If the ideal array cannot be obtained by using magic at most 2^n times, output `NO` in a single line.

Otherwise, output `YES` in the first line and an integer k ($0 \le k \le 2^n$) in the second line indicating the number of times to use magic. Then output k lines, each of which contains $2^{n-1}+1$ integers $x, p_0, p_1, \ldots, p_{2^{n-1}-1}$ separated by spaces. You need to ensure that $p_0, p_1, \ldots, p_{2^{n-1}-1}$ are distinct integers between 0 and 2^n-1, and each of $a_0, a_1, \ldots, a_{2^n-1}$ is always in the range of $[-10^{18}, 10^{18}]$.

If there are multiple solutions, output any.

Examples

standard input	standard output
2 1 14 5 14	YES 4 0 1 0 2 1 2 12 1 3 -1 0 2
2 11 45 1 4	NO

Note

For the first sample, the result after each use of magic is as follows:

1. $\{0+2, 0+0, 0, 0\} = \{2, 0, 0, 0\}$
2. $\{2, 0+2, 0+4, 0\} = \{2, 2, 4, 0\}$
3. $\{2, 2+12, 4, 0+14\} = \{2, 14, 4, 14\}$
4. $\{2-1, 14, 4+1, 14\} = \{1, 14, 5, 14\}$