Homework

Mitko hadn't been paying attention in Math class again so he found out they had homework when the teacher got up to check for it.

The teacher had given them two arrays of n numbers : a_1 , a_2 , ... , a_n and b_1 , b_2 , ... , b_n . He had also given them 3 types of operations:

- 1 ind num : this operation changes the arrays like this $a_{ind} = a_{ind}$ AND num , $b_{ind} = b_{ind}$ AND num (AND is Bitwise And).
- 2 ind num : this operation changes the arrays like this $a_{ind} = a_{ind}$ OR num , $b_{ind} = b_{ind}$ OR num (OR is Bitwise Or).
- 3 ind num : this operation changes the arrays like this $a_{ind} = a_{ind}$ XOR num , $b_{ind} = b_{ind}$ XOR num (XOR is Bitwise Exclusive or).

The goal of the homework is to find a sequence of operations after which a_1 AND a_2 AND ... AND a_n = b_1 AND b_2 AND ... AND b_n ; a_1 OR a_2 OR ... OR a_n = b_1 OR b_2 OR ... OR b_n ; a_1 XOR a_2 XOR ... XOR a_n = b_1 XOR b_2 XOR ... XOR b_n .

The problem is Mitko sits halfway from the teacher and only has enough time to write 20 operations before the teacher reaches him. That's why he asks you to write a program **homework.cpp** , which finds up to 20 operations solving the task.

Input

The first line of the file **homework.in** contains n – the amount of numbers in the array. The next line contains n numbers: a_1 , ... , a_n : the first array. The last line contains n numbers: b_1 , ... , b_n : the second array.

Output

On the first line of the file **homework.out** print the number k: the amount of operations. Each of the next k lines must contain 3 numbers : type ind num , describing what operation should be performed. The output must follow the **Output constraints**.

Input constraints

$1 \leq n \leq 10^6$

$0 \leq a_i, b_i \leq 10^6$

Output constraints

$0 \leq k \leq 20$

$1 \leq type \leq 3$

$1 \leq ind \leq n$

$0 \leq num \leq 10^{18}$

Time Limit: 0.25 sec.

Memory Limit: 256 MB

Sample Test

Input (homework.in)	Output (homework.out)	Explanation
5 2 3 0 2 4 4 2 3 0 1	2 1 1 0 2 5 5	After the first operation the arrays will be: 0 3 0 2 4 0 2 3 0 1 After the second operation the arrays will be: 0 3 0 2 5 0 2 3 0 5 It can be calculated that AND, OR and XOR values are equal for both arrays. This is not the only possible solution.