



Problem M. Multiple Communications

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 1024 mebibytes

This is problem with triple run

Given 200 **1000-bit** non-negative integers a_1, \dots, a_{100} and b_1, \dots, b_{100} .

Alice gets the integers a_i only and can send the 3000-bit message X for Clara.

Bob gets the integers b_i only and can send the 3000-bit message Y for Clara.

Clara received both messages X and Y and shall answer 100 queries.

i -th query consists of non-negative integer c_i , and Clara shall tell the integers x_i and y_i , both between 1 and 100, such that the bitwise XOR of a_{x_i} and b_{y_i} is equal to c_i .

If she will answer 96 or more questions correctly, then the problem is considered as solved.

Input

The first line of the input contains the word “**Alice**”, is this is input for Alice, “**Bob**”, if this is the input for Bob, and “**Clara**” if this is input for Clara.

If it is the input for Alice or Bob, each of 100 following lines contains exactly 1000 characters ‘0’ and ‘1’; i -th of those lines represent a_i (for Alice) and b_i (for Bob).

If it is the input for Clara, the second line contains exactly 3000 characters ‘0’ and ‘1’ — the message from Alice. The third line contains exactly 3000 characters ‘0’ and ‘1’ — the message from Bob. Each of the 100 following lines contains exactly 1000 characters ‘0’ and ‘1’; i -th of those lines represent the query c_i .

Output

When working for Alice and for Bob, your program shall print one string of length exactly 3000, consisting of the characters ‘0’ and ‘1’ — the message for Clara.

When working for Clara, your program shall for each query print the pair of integers x_i and y_i — the answer for this query.

The solution will be considered correct on some test, if it will give correct answer for 96 or more queries from 100.

Examples

standard input	standard output
Alice 110...(total 1000 characters)...101 ...(98 more lines)... 101...(total 1000 characters)...111	111...(total 3000 characters)...111
Bob 11001111...(total 1000 characters)...0100 ...(98 more lines) 11110010...(total 1000 characters)...1010	0000...(total 3000 characters)...0100
Clara 11111...(total 3000 characters)...1111 00000...(total 3000 characters)...0000 10010101...(total 1000 characers)...1011 ...(98 more lines)... 00000100...(total 1000 characters)...1111	1 6 3 100 4 2 1...(96 more lines)... 8 34

Note

Your solution will be executed **three** times on each test independently: once for Alice, once for Bob and once for Clara. If the format of communications between Alice or Bob and Clara is incorrect, you will immediately receive the Wrong Answer error.

The `samples.zip` file contains the sample input for Alice, Bob and Clara; in that input Alice and Bob output all ones and all zeroes, respectively; the other data for Alice, for Bob and for Clara in this sample coincide with real test 1.