Stone Game

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

Chiaki finds the following interesting stone game: two players start with two non-empty piles of stones. In each turn, the player can choose a pile with an even number of stones and move half of the stones of this pile to the other pile. The game ends if a player cannot move, or if we reach a previously reached position. In the first case, the player who cannot move loses. In the second case, the game is declared a draw.

Given two positive integers n and m, Chiaki would like to know the number of pairs (a, b) $(1 \le a \le n, 1 \le b \le m)$ such that if initially the two piles have a and b stones respectively, then the first player has a winning strategy, or the game ends with a draw, or the second player has a winning strategy. Since this number may be very large, you are only asked to calculate it modulo $10^9 + 7$.

Input

There are multiple test cases. The first line of the input contains an integer T, indicating the number of test cases. For each test case:

The first line contains a binary string s $(1 \le |s| \le 10^6)$ – the binary representation of n without leading zeros.

The second line contains a binary string t $(1 \le |t| \le 10^6)$ – the binary representation of m without leading zeros.

It is guaranteed that the sum of the length of binary strings in all test cases will not exceed 2×10^6.

Output

For each test case, output three integers: the number of pairs (a, b) such that first player wins, the game ends with a draw or the second player wins, correspondingly.

Example

standard input	standard output
3 111 111 1111 1111 10101010 1001010	8 24 17 41 116 68 2546 6689 3345

Note

For the first sample:

- The pairs when first player wins: $(2,2)$, $(2,4)$, $(2,6)$, $(4,2)$, $(4,6)$, $(6,2)$, $(6,4)$, $(6,6)$.
- The pairs when the game ends with draw: $(1,2)$, $(1,4)$, $(1,6)$, $(2,1)$, $(2,3)$, $(2,5)$, $(2,7)$, $(3,2)$, $(3,4)$, $(3,6)$, $(4,1)$, $(4,3)$, $(4,5)$, $(4,7)$, $(5,2)$, $(5,4)$, $(5,6)$, $(6,1)$, $(6,3)$, $(6,5)$, $(6,7)$, $(7,2)$, $(7,4)$, $(7,6)$.
- The pairs when the second player wins: $(1,1)$, $(1,3)$, $(1,5)$, $(1,7)$, $(3,1)$, $(3,3)$, $(3,5)$, $(3,7)$, $(4,4)$, $(5,1)$, $(5,3)$, $(5,5)$, $(5,7)$, $(7,1)$, $(7,3)$, $(7,5)$, $(7,7)$.