Problem A. Gregor and the Pawn Game

Time limit 1000 ms
Mem limit 262144 kB

There is a chessboard of size n by n. The square in the i-th row from top and j-th column from the left is labelled (i, j).

Currently, Gregor has some pawns in the n-th row. There are also enemy pawns in the 1-st row. On one turn, Gregor moves one of **his** pawns. A pawn can move one square up (from (i, j) to $(i - 1, j)$) if there is no pawn in the destination square. Additionally, a pawn can move one square diagonally up (from (i, j) to either $(i - 1, j - 1)$ or $(i - 1, j + 1)$) if and only if there is an enemy pawn in that square. The enemy pawn is also removed.

Gregor wants to know what is the maximum number of his pawns that can reach row 1?

Note that only Gregor takes turns in this game, and **the enemy pawns never move**. Also, when Gregor's pawn reaches row 1, it is stuck and cannot make any further moves.

Input

The first line of the input contains one integer t ($1 \le t \le 2 \cdot 10^4$) — the number of test cases. Then t test cases follow.

Each test case consists of three lines. The first line contains a single integer n ($2 \le n \le 2 \cdot 10^5$) — the size of the chessboard.

The second line consists of a string of binary digits of length n, where a 1 in the i-th position corresponds to an enemy pawn in the i-th cell from the left, and 0 corresponds to an empty cell.

The third line consists of a string of binary digits of length n, where a 1 in the i-th position corresponds to a Gregor's pawn in the i-th cell from the left, and 0 corresponds to an empty cell.

It is guaranteed that the sum of n across all test cases is less than $2 \cdot 10^5$.

Output

For each test case, print one integer: the **maximum** number of Gregor's pawns which can reach the 1-st row.

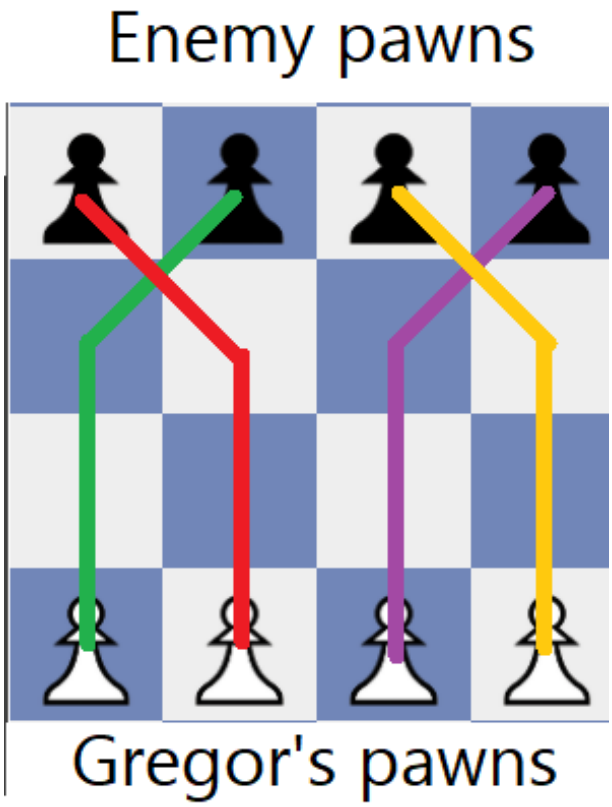
Sample 1

Input	Output
4 3 000 111 4 1111 1111 3 010 010 5 11001 00000	3 4 0 0

Note

In the first example, Gregor can simply advance all 3 of his pawns forward. Thus, the answer is 3 .

In the second example, Gregor can guarantee that all 4 of his pawns reach the enemy row, by following the colored paths as demonstrated in the diagram below. Remember, only Gregor takes turns in this "game"!



In the third example, Gregor's only pawn is stuck behind the enemy pawn, and cannot reach the end.

In the fourth example, Gregor has no pawns, so the answer is clearly 0.