The problem statement has recently been changed. View the changes. ×

C. Cherry Bomb

time limit per test: 2 seconds
memory limit per test: 256 megabytes

Two integer arrays a and b of size n are **complementary** if there exists an integer x such that $a_i + b_i = x$ over all $1 \le i \le n$. For example, the arrays $a = [2, 1, 4]$ and $b = [3, 4, 1]$ are complementary, since $a_i + b_i = 5$ over all $1 \le i \le 3$. However, the arrays $a = [1, 3]$ and $b = [2, 1]$ are not complementary.

Cow the Nerd thinks everybody is interested in math, so he gave Cherry Bomb two integer arrays a and b. It is known that a and b both contain n **non-negative** integers not greater then k.

Unfortunately, Cherry Bomb has lost some elements in b. Lost elements in b are denoted with -1. Help Cherry Bomb count the number of possible arrays b such that:

- a and b are **complementary**.
- All lost elements are replaced with non-negative integers no more than k.

Input

The first line of the input contains a single integer t ($1 \le t \le 10^4$) — the number of test cases.

The first line of each test case contains two integers n and k ($1 \le n \le 2 \cdot 10^5$, $0 \le k \le 10^9$) — the size of the arrays and the maximum possible value of their elements.

The second line contains n integers $a_1, a_2, \ldots, a_n$ ($0 \le a_i \le k$).

The third line contains n integers $b_1, b_2, \ldots, b_n$ ($-1 \le b_i \le k$). If $b_i = -1$, then this element is missing.

It is guaranteed that the sum of n over all test cases does not exceed $2 \cdot 10^5$.

Output

Output exactly one integer, the number of ways Cherry Bomb can fill in the missing elements from b such that a and b are complementary.

Example

input Copy

```
7
3 10
1 3 2
-1 -1 1
5 1
0 1 0 0 1
-1 0 1 0 -1
5 1
0 1 0 0 1
-1 1 -1 1 -1
5 10
1 3 2 5 4
-1 -1 -1 -1 -1
5 4
1 3 2 1 3
1 -1 -1 1 -1
5 4
1 3 2 1 3
2 -1 -1 2 0
5 5
5 0 5 4 3
5 -1 -1 -1 -1
```

output Copy

```
1
0
0
```

Codeforces Round 1020 (Div. 3)
Contest is running
00:47:56
Contestant

→ Submit?

Language: GNU G++23 14.2 (64 bit, ms

Choose file: Choose File No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
317052719	Apr/24/2025 19:00	Accepted
317049441	Apr/24/2025 18:54	Wrong answer on test 1
317048684	Apr/24/2025 18:53	Wrong answer on test 1
317045368	Apr/24/2025 18:47	Wrong answer on test 1
317044674	Apr/24/2025 18:46	Wrong answer on test 1

```
7
0
1
0
```

Note

In the first example, the only way to fill in the missing elements in b such that a and b are complementary is if $b = [2, 0, 1]$.

In the second example, there is no way to fill in the missing elements of b such that a and b are complementary.

In the fourth example, some b arrays that are complementary to a are:
$[4, 2, 3, 0, 1]$, $[7, 5, 6, 3, 4]$, and $[9, 7, 8, 5, 6]$.