



C. Smilo and Minecraft

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

The boy Smilo is playing Minecraft! To prepare for the battle with the dragon, he needs a lot of golden apples, and for that, he requires a lot of gold. Therefore, Smilo goes to the mine.

The mine is a rectangular grid of size $n \times m$, where each cell can be either gold ore, stone, or an empty cell. Smilo can blow up dynamite in any empty cell. When dynamite explodes in an empty cell with coordinates (x, y) , all cells within a square of side $2k + 1$ centered at cell (x, y) become empty. If gold ore was located **strictly inside** this square (not on the boundary), it disappears. However, if the gold ore was on the boundary of this square, Smilo collects that gold.

Dynamite can only be detonated inside the mine, but the explosion square can extend beyond the mine's boundaries.

Determine the maximum amount of gold that Smilo can collect.

Input

Each test contains multiple test cases. The first line contains the number of test cases t ($1 \leq t \leq 10^4$). The description of the test cases follows.

The first line of each test case contains three integers n , m , and k ($1 \leq n, m, k \leq 500$) — the number of rows, columns, and the explosion parameter k , respectively.

Each of the following n lines contains m characters, each of which is equal to '.', '#', or 'g', where '.' — is an empty cell, '#' — is stone, 'g' — is gold. It is guaranteed that at least one of the cells is empty.

It is guaranteed that the sum $n \cdot m$ across all test cases does not exceed $2.5 \cdot 10^5$.

Output

For each test case, output a single integer — the maximum amount of gold that can be obtained.

Example

input	Copy
3 2 3 1 #.# g.g 2 3 2 #.# g.g 3 4 2 .gg. g..# g##.	
output	Copy
2 0 4	

Note

In the first test case, Smilo can detonate the dynamite in any empty cell and obtain 2 gold:

Codeforces Round 1031 (Div. 2)

Finished

Practice



→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

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

Choose file: Choose File No file chosen

Submit

→ Last submissions

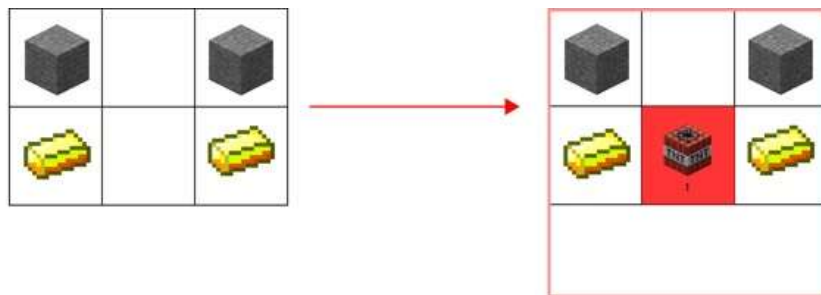
Submission	Time	Verdict
324655065	Jun/16/2025 16:58	Accepted
324504649	Jun/15/2025 13:43	Wrong answer on pretest 2
324503794	Jun/15/2025 13:41	Wrong answer on pretest 2
324465985	Jun/15/2025 12:19	Wrong answer on pretest 2

→ Problem tags

brute force constructive algorithms dp greedy

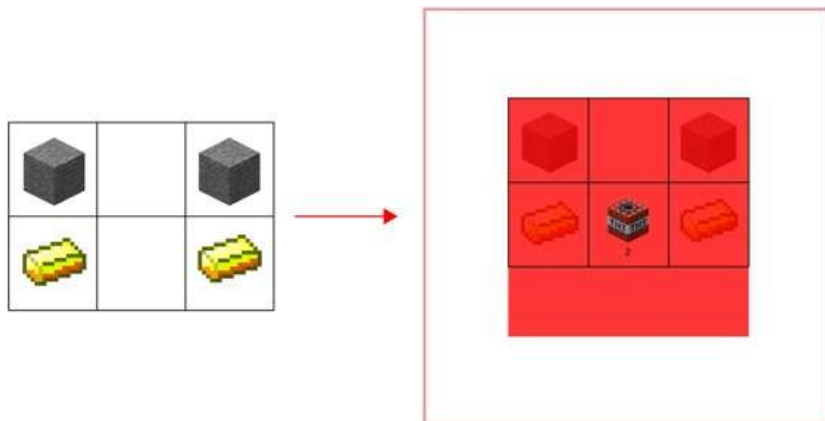
No tag edit access

→ Contest materials



- [Announcement \(en\)](#)
- [Tutorial \(en\)](#)

In the second test case, no matter what Smilo does, he will not be able to obtain any gold:



In the third test case, it is possible to detonate the dynamite in the bottom right corner to obtain 2 gold, and then make another explosion one cell to the left to obtain the remaining 2 gold:

