Problem B - Balloon Mayhem

Daniel and David inflated way too many balloons, so they decided to go outside and let some of them fly with the ACM team. They want to move balloons to specific locations to let them loose into the sky. However, they don't want to let too many balloons fly at a specific location since it's prettier to have balloons fly out from different locations.

They start with a $x \times y$ grid. Each grid cell has one of the following rules:

- `*` This square has grass. A single person with a single balloon is on each of these squares. To not trample over all the grass, nobody else should step into the square.
- `~` There's a tree here, so nobody can ever stand on this square.
- `.` This square has grass. To not trample over all the grass, after one person steps on this square, nobody else should step into the square.
- `@` This square has dirt. There is no limit on the number of people that can step on the dirt squares.
- `#` This square has dirt, and are the specified spots to let go of the balloons. At most p balloons should be let go here. Anyone can freely walk through this square.

Help determine the number of balloons that you can let fly!

Input

The first line contains T, the number of test cases.

Each test case begins with three integers x, y, p $(1 \leq x, y \leq 30)(1 \leq p \leq 10)$ the size of the grid and the number of balloons that can be released at each specified spot to release balloons. Following this will be x lines with y characters on each line as described above. It is guarenteed that at most 50% of the total area has someone with a balloon.

Output

For each test case, output the maximum number of balloons that can be released while satisfying the constraints.

Sample Input

```
3
3 4 2
*~~#
...@
.~.*
3 5 1
~~*~~
#.@.#
~~*~~
1 4 2
**#~
```

Sample Output

```
2
2
1
```