

Problem F

Nurikabe

Nurikabe is a binary determination puzzle originating from Japan. Given a grid where some cells contain numbers, the objective of the puzzle is to mark each blank cell as either island (white) or water (black), while obeying the following constraints:

- Each island has exactly one numbered cell, containing a number between 1 and 9. The number of white cells (including the numbered cell) in this island is equal to this number. Two cells are connected if they share a side. Two cells belong to the same island if there exists a path going through connected island cells.
- All water cells (black) are connected. Water cells are connected in the same manner as island cells.
- Within a 2×2 block there must be at least one cell belonging to an island.

2								2
							2	
2			7					
							3	3
		2					3	
2								4
1							2	4

In this problem, you are asked to verify that Nurikabe puzzles are solved correctly.

Input specifications

The first line of input contains a single number T , the number of test cases that follow. The first line of each test case contains integers N and M , the size of a puzzle in rows and columns. The next N lines contain the rows of the puzzle. Each line contains characters from the set 123456789.# where . and any digit represent an island cell and # represents a water cell.

Output specifications

For each test case, output YES if the board is filled in correctly according to the rules, and NO otherwise.

Notes and Constraints

- $0 < T \leq 100$
- $1 \leq N, M \leq 50$
- Recent surveys indicate that more than seven billion chocolate chip cookies are eaten annually.

Sample input

```
2
9 10
2.#...##.2
###..#2###
#2#.7#.#.#
#.#####.#
##.#..3#3#
.#2#####3##
2##4.#..#.
##..#####
#1###.2#4.
2 2
#1
1#
```

Output for sample input

```
YES
NO
```