

---

## Generalized chess knight

P22796\_en

Dotzè Concurs de Programació de la UPC - Final (2014-10-01)

---

Let us define an  $(a, b)$  knight as a piece that moves by jumping  $a$  cells in one direction and  $b$  cells in the other direction, where the possible directions are horizontal and vertical. For instance, the traditional chess knight is a  $(1, 2)$  knight.

Given an  $n \times m$  board with obstacles, an initial position  $(i_1, j_1)$ , a final position  $(i_2, j_2)$ , and the pair  $(a, b)$ , can you tell if an  $(a, b)$  knight initially located at  $(i_1, j_1)$  can reach  $(i_2, j_2)$  in two or less steps? The knight can never leave the board, nor visit any obstacles.

### Input

Input consists of several cases, each with  $n$  and  $m$ , followed by the board ( $n$  lines with  $m$  characters each, where an 'x' indicates an obstacle and a '.' indicates a free cell), followed by  $i_1, j_1, i_2, j_2, a$  and  $b$ . Assume that  $n$  and  $m$  are between 1 and 42, that  $(i_1, j_1)$  and  $(i_2, j_2)$  are free positions inside the board, and  $1 \leq a < b \leq 5$ . The upper-left position is  $(0, 0)$ .

### Output

For every case, print "yes" or "no" depending on whether the goal position is reachable from the initial position in two or less steps.

#### Sample input

```
2 3
...
...
0 0 1 2 1 2

4 5
.....
XXXXX
XXXXX
.....
0 1 3 0 1 3

5 5
.XXX.
XXXXX
XXXXX
XXXXX
XX.XX
0 4 0 0 2 4

5 5
.XXX.
XXXXX
XXXXX
XXXXX
XXXXX
0 4 0 0 2 4

1 8
XXXXXXXX.
0 7 0 7 3 5
```

#### Sample output

```
yes
yes
yes
no
yes
```

**Problem information**

Author : Enric Cusell

Generation : 2014-10-02 12:57:02

© *Jutge.org*, 2006–2014.

<http://www.jutge.org>