You are given a *m x n* 2D grid initialized with these three possible values.

1. -1 - A wall or an obstacle.
2. 0 - A gate.
3. INF - Infinity means an empty room. We use the value 231 - 1 = 2147483647 to represent INF as you may assume that the distance to a gate is less than 2147483647.

Fill each empty room with the distance to its *nearest* gate. If it is impossible to reach a gate, it should be filled with INF.

**Example:**

Given the 2D grid:

INF -1 0 INF

INF INF INF -1

INF -1 INF -1

0 -1 INF INF

After running your function, the 2D grid should be:

3 -1 0 1

2 2 1 -1

1 -1 2 -1

0 -1 3 4