

Problem J. Jigglypuff

Input file: standard input
Output file: standard output
Time limit: 1 second
Memory limit: 512 megabytes

Your ACM team has gathered in a picturesque city of Petrozavodsk for a team-building camp. You've heard that just outside of the city there is a Jigglypuff field that might help you make stronger bonds with your teammates, so you're definitely giving it a try.

The field is a rectangle partitioned into $n \cdot m$ squares grouped into n rows and m columns. Each square contains a single Jigglypuff, which produces a note when a team member steps on its cell. Each note can be described by a single lowercase English character.

You and your two teammates will stand in the top-left corner of the field. Each of you will then go to the bottom-right corner, moving only right and down. Each of you has to pick a different route through the field.

Jigglypuff have psychic abilities. Therefore, if each of you hears exactly the same sequence of notes when passing through the field, your brains will perfectly synchronize and the team-building exercise will be complete. Is it possible to do so?

Input

The first line contains two integers n, m ($2 \leq n, m \leq 3000$) — the height and the width of the field. The following n lines describe the field. Each of these lines contains a single string of length m consisting of lowercase English characters. The first character in the first line is the top-left corner of the field.

Output

Output YES if it's possible to hear the same sequence of notes on at least three different routes through the grid, or NO otherwise. Each character can be printed in any case (either uppercase or lowercase).

Examples

standard input	standard output
5 8 petrozav eiiiizio tiiiavid riiiiiois ozavodsk	YES
5 5 abcde fghij klmno pqrst uvwxy	NO

Note

The following picture shows the first example test and three paths generating the same sequence of notes — petrozavodsk:

♪ p	♪ e	♪ t	♪ r	♪ o	♪ z	♪ a	♪ v
♪ e	♪ i	♪ i	♪ i	♪ z	♪ i	♪ i	♪ o
♪ t	♪ i	♪ i	♪ i	♪ a	♪ v	♪ i	♪ d
♪ r	♪ i	♪ i	♪ i	♪ i	♪ o	♪ i	♪ s
♪ o	♪ z	♪ a	♪ v	♪ o	♪ d	♪ s	♪ k

A word search grid with 5 rows and 8 columns. Each cell contains a musical note icon followed by a letter. The letters are: Row 1: p, e, t, r, o, z, a, v; Row 2: e, i, i, i, z, i, i, o; Row 3: t, i, i, i, a, v, i, d; Row 4: r, i, i, i, i, o, i, s; Row 5: o, z, a, v, o, d, s, k. A path is highlighted with colored lines: a green line starts at the top-left cell (p) and goes down to the bottom-left cell (o); a blue line starts at the top-left cell (p) and goes right to the top-right cell (v); a red line starts at the top-right cell (v) and goes down to the bottom-right cell (k); a blue line starts at the top-right cell (v) and goes down to the middle-right cell (i), then left to the middle-left cell (i), then down to the bottom-right cell (k).