

Competitive Programming SS23

Submit until end of contest



Problem: parpuz (1.0 second timelimit)

Note: This is a problem that is harder to solve than usual. Solve the other problems first before spending too much time on this one.

On his last birthday Bob got a puzzle as a present. But it was not a normal puzzle, it was a parentheses puzzle. In such a puzzle every piece is a part of a bracket sequence and to complete the puzzle you need to create a valid bracket sequence of all parts.

The following rules (completely) define whether a sequence is a valid:

1. The empty string is valid.
2. If A is valid, then (A) is also valid.
3. If the strings A and B are valid, then AB is valid.

But Bob is not sure if he still has all parts of his puzzle. Can you help Bob and check if it is possible to solve the puzzle?

Input The first line of the input contains a single integer n ($1 \leq n \leq 10^5$) the number of pieces. The next n lines each describe a single piece with a string consisting of $($ and $)$. It is guaranteed that the total length of all all pieces is no longer than 10^5 .

Output Print YES if there is a solution or NO if not.

Sample input

```
1
() (())
```

```
2
())
((
```

```
6
))) ((((((
((
(
((( ))
)))
())))
```

Sample output

```
YES
```

```
NO
```

```
YES
```