Forest Fires

Forest fires are really dangerous, and can be started by even the smallest flame. Spreading from tree to tree, fires can engulf an entire forest in a matter of weeks. Given a map of a forest with locations of where a fire (or multiple fires) might have started, determine how long it would take the fire to capture the entire forest.

Input

The input contains a 10x10 map (i.e. 10 lines each consisting of 10 characters), where each character in the map is one of the following:

> . - blank space
> T - a tree
> F - a tree on fire

Fires only spread from trees that are on fire to adjacent trees in one of four directions: North, South, East or West (so not diagonally). It takes 1 unit of time for the fire to spread from one location to the next. The fire spreads in all 4 directions at the same time (i.e. fires move outwards from the source).

Output

The output should contain the time it takes for the fire to capture the entire forest (i.e. the time it takes for every tree to catch fire). If some piece of the forest survives, output -1.

Example

Input:

```
..........
..........
..........
..........
..TTTTT...
..F...F...
..........
..........
..........
..........
```

Output:

3