Grid World

Description

Kevin got lost in a maze and even worse he left his wallet somewhere in the maze. The Maze is described as an N by N matrix (10<N<100), with WALLs and ROADs in it. The maze is surrounded with WALLs with a gate open. He wants to get back his wallet and leave the maze. Can you find out the shortest path for him?

Kevin can only move UP, DOWN, LEFT, or RIGHT to the neighbor grids within the bound and he cannot cross any WALL.
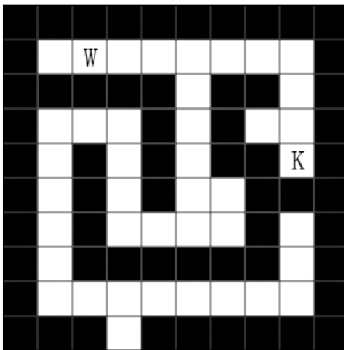

Figure 1: Example of the sample input.

Input

The input file contains multiple test cases.
The first line contains an integer T, representing the number of test cases. For each test case, the first line contains an integer N, representing the size of the maze.
Then, for the following N lines, each line contains a series of characters, where the character "#", ".", "W" and "K" represent the WALL, the ROAD, the Wallet and Kevin respectively.

Output

For each test case, output the number of minimum steps in a new line.

Sample Input	Sample Output
1 10 ########## #.W......# #####.##.# #...#.#..# #.#.#.##K# #.#.#..### #.#....#.# #.######.# #........# ##########	32