Problem K. King's Festival

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1.5 seconds
Memory limit:	1024 megabytes

For the upcoming festival, the Dwarf King wants to light up the town hall of the kingdom. The hall is a grid consisting of $N \times N$ square tiles, and all these tiles must be illuminated. However, in order to save energy and preserve the magical power of the lanterns, the king wants to use as few lanterns as possible. He decided to limit the placement of these lanterns to the main diagonal of the grid, which runs from the top-left corner to the bottom-right corner.

The magic lanterns were crafted a long time ago and have a unique power: not only they illuminate the tile on which they stand, but they also cast long beams of light in specific patterns. That is, when placed on a floor tile, each lantern would light up:

- all the tiles in its row,
- all the tiles in its column, and
- all tiles in both diagonals passing through its tile.

Some of these lanterns have already been placed by the dwarf engineers, fixed firmly to the ground, and they could not be moved.

Input

The input is just one line describing the lanterns already placed on the main diagonal. It contains a single string where each character is either `.` or `#`. The i-th square of the diagonal already contains a lantern if and only if the i-th character is equal to `#`.

Limits String from the input contains at least 1 and at most 64 characters.

Output

The first line of the output should contain a single integer: the smallest number of lanterns that need to be placed on the main diagonal to illuminate all the squares of the town hall (including those already placed). The second line of the output should contain the description of the lantern placement in the same format as in the input; this should include the lamps placed initially. If there are multiple correct solutions, you may output any of them.

Examples

standard input	standard output
`......`	`4` `###.#.`
`.#.#...`	`4` `.###.#.`