

Output

If the signal provided in the input data could not have been produced under the given conditions, print a single number -1 .

Otherwise, print a single integer $K \geq 0$ into the first line, being the minimum possible number of errors; into the second line, print the original text, which could produce the signal with this number of errors. The words of the text must be separated with exactly one space.

If there are several variants of the original text which could produce the signal with minimal number of errors, print the **lexicographically minimal** one among them. It is assumed that a space is smaller than any letter.

Examples

input.txt	output.txt
2 109 HELLO WORLD ++++++-----+-----+-----+----- +-----+-----+-----+-----+-----+----- +-----+-----+-----+-----+-----+----- +-----+-----+-----+-----+-----+-----	0 HELLO WORLD
3 115 WORLD PROGRAM HELLO ++++++-----+-----+-----+----- +-----+-----+-----+-----+-----+----- +-----+-----+-----+-----+-----+----- +-----+-----+-----+-----+-----+-----	12 HELLO WORLD
1 13 E +-----+	-1
1 13 HELLO +-----+-----+-----+	-1

Example explanation

The first sample contains exactly the example from the problem statement without any errors. In the second sample the text is the same, but twelve elements are cut/extended by one tick.

In the third sample there is an 11-tick pause, which is impossible to produce. The longest element is a 5-tick pause between words, which can become 6-tick long as the result of an error.

In the fourth sample, there are five dots, and they can make up the letters E, I, S and H in various combinations, however, there is only one word HELLO in the dictionary, which cannot be built using these letters alone.