Coding Challenge 2: Word Chains

There's a type of puzzle where the challenge is to build a chain of words, starting with one particular word and ending with another. Successive entries in the chain must all be real words, and each can differ from the previous word by just one letter. For example, you can get from "cat" to "dog" using the following chain.

```
cat –> cot –> cog –> dog
```

The objective of this challenge is to write a program that accepts start and end words and, using only words from the supplied dictionary file (*50kwords.txt*), builds the shortest word chain between them.

The input for the challenge will be supplied as a simple text file called 'wordpairs.txt'. Each line text file contains two words, with a space between them. Sample input:

```
cat dog
lead gold
ruby code
```

You must calculate the shortest chain for each pair of words. For each pair, if a word chain is possible, your output should be the length of the chain (including both ends), a space, then the chain itself. There might be more than one valid shortest chain, but only print one of them. Sample output:

```
4 cat,cot,cog,dog
4 lead,load,goad,gold
6 ruby,rubs,robs,rods,rode,code
```

If no valid chain can be found, there should be no output line for that pair.

Constraints:

- Input words will be between 3 and 7 letters in length
- Each word pair has two different words of the same length
- The input file can have any number of lines

There might be a (small) prize for the solution that produces the correct output in the shortest time, when tested against a secret input file matching the constraints above.