

A developer of crossword puzzles (and other similar word games) has decided to develop a mapping between every possible word with from one to twenty characters and unique integers. The mapping is very simple, with the ordering being done first by the length of the word, and then alphabetically. Part of the list is shown below.

a	1
b	2
...	
z	26
aa	27
ab	28
...	
snowfall	157,118,051,752
...	

Your job in this problem is to develop a program which can translate, bidirectionally, between the unique word numbers and the corresponding words.

Input

Input to the program is a list of words and numbers, one per line starting in column one, followed by a line containing a single asterisk in column one. A number will consist only of decimal digits (0 through 9) followed immediately by the end of line (that is, there will be no commas in input numbers). A word will consist of between one and twenty lowercase alphabetic characters (a through z).

Output

The output is to contain a single line for each word or number in the input data. This line is to contain the word starting in column one, followed by an appropriate number of blanks, and the corresponding word number starting in column 23. Word numbers that have more than three digits must be separated by commas at thousands, millions, and so forth.

Sample Input

```
29697684282993
transcendental
28011622636823854456520
computationally
zzzzzzzzzzzzzzzzzzzzzzzzzzzzzz
*
```

Sample Output

elementary	29,697,684,282,993
transcendental	51,346,529,199,396,181,750
prestidigitation	28,011,622,636,823,854,456,520
computationally	232,049,592,627,851,629,097
zzzzzzzzzzzzzzzzzzzzzzzzzzzzzz	20,725,274,851,017,785,518,433,805,270