

## Problem A. B + A

Input file:            `standard input`  
Output file:         `standard output`  
Time limit:          1 second  
Memory limit:       256 megabytes

A *properly capitalized word* is any string consisting of one uppercase Latin letter (A-Z), followed by zero or more lowercase Latin letters (a-z).

Given two properly capitalized words, concatenate the second word before the first word, and change the case of any letters as needed to ensure the result is also properly capitalized.

### Input

The first line contains the properly capitalized word  $A$  ( $1 \leq |A| \leq 300\,000$ ).

The second line contains the properly capitalized word  $B$  ( $1 \leq |B| \leq 300\,000$ ).

### Output

Print the properly capitalized compound word.

### Examples

standard input	standard output
A B	Ba
Man Spider	Spiderman

## Problem B. Harmony

Input file:            `standard input`  
Output file:          `standard output`  
Time limit:           1 second  
Memory limit:        256 megabytes

A musical note is a sound wave with a distinct fundamental *frequency*. A pair of notes will harmonize if its frequencies approximate a simple ratio.

Your piano has lots of pressable keys arranged in a linear sequence. Each key would play a note with frequency  $2^{1/12}$  (a little under 1.06) times the previous. The notes are named in batches of 12: A, A#, B, C, C#, D, D#, E, F, F#, G, G#, then the names start over again from A. Thus, one may multiply or divide the frequency of a note by any power of 2 without changing its name.

You'd like to play two notes whose frequencies are in the ratio  $p : q$ . Since it may be impossible to achieve this exactly, each note's tuning can be modified by up to 25 *cents*, in integer increments. Modification by  $c$  cents raises a note's frequency by a factor of  $2^{c/1200}$ .

Choose two notes and their respective modifications so that their ratios are as close as possible to  $p : q$ .

### Input

Two space-separated integers  $p$  and  $q$  ( $1 \leq p, q \leq 80$ ).

### Output

Output two lines, describing the notes with relative frequency  $p$  and  $q$ , respectively.

Each line is a note name followed a space and then an integer with absolute value not exceeding 25, denoting the tuning modification in cents.

Your answer will be accepted if some choice of notes with the names you printed would yield a frequency ratio within 0.6 cents (i.e., within a factor  $2^{1/2000}$ ) of  $p : q$ .

### Examples

standard input	standard output
4 5	G 0 B -14
4 6	B 0 F# 2
1 11	G# 24 D -25
18 17	A# 0 A 1
79 80	G 0 G 22