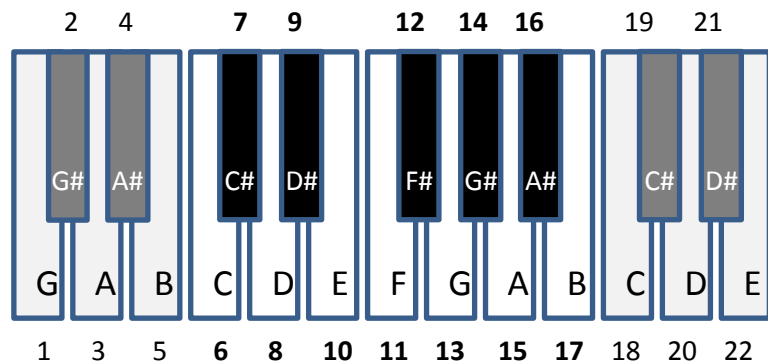


Q8: MOVE THOSE KEYS

A standard piano has twelve keys in a C scale – seven white keys (C, D, E, F, G, A, B) and five black keys (C#, D#, F#, G#, A#). These keys repeat in octaves. Shown here, keys numbered 6-17 are the primary octave while keys 1-5 are the partial octave on the left and keys 18-22 are the partial octave on the right. A black key is identified by two characters with the first character being a letter (C, D, F, G, or A) and the second character a “#”.



From a C key, you can advance 4 keys to the right (skipping C#, D, D#) to reach an E key. From a G key you can decrease 6 keys to the left (skipping F#, F, E, D#, D) to reach a C# key. Thus you can *transpose* a C key to an E key by advancing 4 keys and you can transpose a G key to a C# key by decreasing 6 keys.

A chord contains a number of keys played simultaneously and they are identified from left to right on the keyboard as a sequence of keys. Thus the C major chord is represented as “CEG”, a D major chord would be “DF#A”, while a more complex chord would be “BDFG#”. Note how in this last chord the B key is in the octave to the left of the primary keys above (numbered 5) while the other keys are in the primary octave (numbered 8, 11 and 14). Chord “CEGC” includes two C notes in different octaves.

To transpose a C major chord into a D major chord, advance two keys to the right; in this case, the C becomes a D, the E becomes an F# and the G becomes an A. You can also transpose an F major chord “FAC” three keys to the left to become a D major chord.

For this problem, you are asked to transpose a given chord (up or down) a number of keys.

Input

The input consists of a single line containing a chord and an integer N separated by a space. N will be a non-zero number between -11 and 11, inclusive. The chord will be represented by a sequence of CAPITAL letters and the ‘#’ character, designating black keys. The chord will contain no more than five keys and you can assume it will only span one or two octaves (never more).

Output

The output consists of a single line containing the transposed chord.

Sample Input and Output

Input	Output
CEG 2	DF#A
FAC 5	A#DF
G -6	C#
BDFG# -2	ACD#F#

Input	Output
CEG -1	BD#F#
F#G#A# -1	FGA
CEG 11	BD#F#
CEGC 2	DF#AD