

1. As you walk along TU campus, you see lots of trees of different species on your way. Horticulture Centre has prepared a list of every tree standing on the way from CSE Department to the Main Gate. You have to report the percentage of each tree species.

Input

Input to your program consists of a list of the species of every tree observed by the Horticulture Department; one tree per line in .txt file. No species name exceeds 30 characters.

Output

Print the name of each tree species available in TU (sorted in order of their percentage), followed by the percentage of the population it represents.

Sample Input

Bor-heloch
Kathal
Boro mankachu
Madhuriam
Naharu
Gorokhia koroi
Kathal
Hatisur
Naharu
Naharu
Simul
Kathal
Madhuriam
Jutuli
Kadom
Kuhum kata
Madhuriam
Naharu
Kathal
Tamul
Usipak

Sample Output

Kathal, 19.05
Naharu, 19.05
Madhuriam, 14.29
Bor-heloch , 4.76
Boro mankachu, 4.76
Gorokhia koroi, 4.76
Hatisur, 4.76
Jutuli, 4.76
Kadom, 4.76
Kuhum kata, 4.76
Simul, 4.76

2. A left rotation operation on an array of size n shifts each of the array's elements d unit to the left.
For example, if 2 left rotations are performed on array $A=[1,2,3,4,5]$, then the array would become $A=[3,4,5,1,2]$.

Given an array of n integers and a number d perform d left rotations on the array. Then print the updated array as a single line of space-separated integers.

3. Consider two sets of positive integers, A and B . We say that a positive integer x is *between* sets A and B if the following conditions are satisfied:

All elements in A are factors of x .
 x is a factor of all elements in B .

In other words, some x is between A and B if

$x \% A[i] = 0$ for every element in A and
 $B[i] \% x = 0$ for every element in B .

For example, if $A=[3,6]$ and $B=[12,18]$, then our possible x values are 6 and 12. Given A and B , find and print the number of integers (i.e., possible x 's) that are *between* the two sets.