

DMOPC '18 Contest 5 P2 - A Photography Problem

When taking digital photos, it is important to get the proper **exposure** (brightness). A photo can be represented as a grid of N by M pixels, and the pixel in row i and column j has a brightness $b_{i,j}$, which can be any real number from 10^{-3} to 1 inclusive. If you average the brightnesses of all the pixels in a typical image, the result is 0.48. Images whose average is lower than that are **underexposed**, and those whose average is higher are **overexposed**.

Most digital cameras have an exposure correction feature. By choosing a correction constant C and multiplying all the pixel brightnesses in an image by C , a darker or brighter image can be obtained. **When applying a correction constant, if any pixel brightnesses become greater than 1, those values are "clipped" and reduced to 1.**

Given an image, first determine if it is underexposed, overexposed, or correctly exposed. If the image is not correctly exposed, please find the C that would correct its average brightness to 0.48. You may consider the image correctly exposed if the required C is within 10^{-5} of 1.

Constraints

$$1 \leq N, M \leq 1\,000$$

$$10^{-3} \leq b_{i,j} \leq 1.0$$

It is guaranteed that no underexposed or overexposed image has a required C within 10^{-5} of 1.

Input Specification

The first line will contain two space-separated integers, N and M .

The next N lines will each contain M space-separated real numbers, the pixel brightnesses.

Output Specification

On one line, output the string `underexposed`, `overexposed`, or `correctly exposed`. If the image is not correctly exposed, output an additional line containing one positive real number, the required C . Your answer will be considered correct if it has an absolute error of no more than 10^{-5} .

Sample Input 1

```
2 3
0.36 0.304 0.12
0.408 0.312 0.96
```

Sample Output 1

underexposed

1.25

Sample Input 2

2 3

0.48 0.58 0.56

0.38 0.40 0.48

Sample Output 2

correctly exposed