Stock Market Ratio

`ratio.p`, `ratio.c`, `ratio.C`

When entering the European Union, the candidate countries have to get used to new business customs, especially to the stock market and its behavior. If you ever see a televised report on stock market activity, you can hear the anchorperson say something like "Gainers outnumbered losers 14 to 9," which means that for every 14 stocks that increased in value that day, approximately 9 other stocks declined in value. Often, as you hear that, you'll see on the screen something like this:

Gainers	1498
Losers	902

As a person with a head for numbers, you'll notice that the anchorperson could have said "Gainers outnumbered losers 5 to 3", which is a more accurate approximation to what really happened. After all, the exact ratio of winners to losers is (to the nearest millionth) 1.660754, and he reported a ratio of 14 to 9, which is 1.555555, for an error of 0.105199; he could have said "5 to 3", and introduced an error of only $1.666667 - 1.660754 = 0.005913$. The estimate "5 to 3" is not as accurate as "1498 to 902" of course; evidently, another goal is to use small integers to express the ratio. So, why did the anchorperson say "14 to 9?" Because his algorithm is to lop off the last two digits of each number and use those as the approximate ratio.

What the anchorman needs is a list of rational approximations of increasing accuracy, so that he can pick one to read on the air. Specifically, he needs a sequence a_1, a_2, ..., a_n where a_1 is a rational number with denominator 1 that most exactly matches the true ratio of winners to losers (rounding up in case of ties), a_{i+1} is the rational number with least denominator that provides a more accurate approximation than a_i, and a_n is the exact ratio, expressed with the least possible denominator. Given this sequence, the anchorperson can decide which ratio gives the best tradeoff between accuracy and simplicity.

For example, if 5 stocks rose in price and 4 fell, the best approximation with denominator 1 is 1/1; that is, for every stock that fell, about one rose. This answer differs from the exact answer by 0.25 (1.0 vs 1.25). The best approximations with two in the denominator are 2/2 and 3/2, but neither is an improvement on the ratio 1/1, so neither would be considered. The best approximation with three in the denominator 4/3, is more accurate than any seen so far, so it is one that should be reported. Finally, of course, 5/4 is exactly the ratio, and so it is the last number reported in the sequence.

Can you automate this process and help the anchorpeople?

Input Specification

The input file contains several pairs of positive integers. Each pair is on a line by itself, beginning in the first column and with a space between the two numbers. The first number of a pair is the number of gaining stocks for the day, and the second number is the number of losing stocks for the day. The total number of stocks never exceeds 5000.

Output Specification

For each input pair, the standard output should contain a series of approximations to the ratio of gainers to losers. The first approximation has 1 as denominator, and the last is exactly the ratio of gainers to losers, expressed as a fraction with least possible denominator. The approximations in between are increasingly accurate and have increasing denominators, as described above. If there are two approximations with the same denominator, which are equally accurate, choose the one with a higher numerator.

The approximations for a pair are printed one to a line, beginning in column one, with the numerator and denominator of an approximation separated by a slash ("/"). A blank line follows each sequence of approximations.

Sample Input

```
5 4
1498 902
```

Output for Sample Input

```
1/1
4/3
5/4

2/1
3/2
5/3
48/29
53/32
58/35
63/38
68/41
73/44
78/47
83/50
88/53
93/56
377/227
470/283
563/339
656/395
749/451
```

P.S.: Please keep in mind that if your program produces more approximation pairs than needed, you will probably get the "presentation error" response, although the "wrong answer" would be more appropriate in that case.