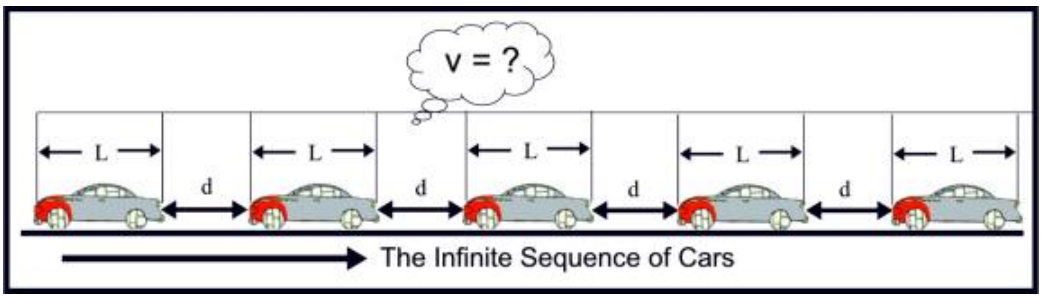
UVa Online Judge

10693 Traffic Volume

In the picture below (or above depending on HTML response :)) you can see a street. It has infinite number of cars on it. The distance between any two consecutive cars is d, length of each car is L and the velocity of each car is v. The volume of cars through a road means the number of cars passing through a road in a specific amount of time. When the velocity is constant, d must be minimum for the volume of cars passing through the road to be maximal. In our model when the velocity of all the cars is v then the minimum possible value of d is $v^2/(2f)$ (The more the car velocity the more distance you need to bring down your velocity to zero). Here f is the deceleration due to break.



Keeping this model in mind and given the value of L and f your job is to find the value of v for which the volume of traffic through the road is maximal.

Input

The input file contains several lines of input. Each line of input contains two integers L $(0 < L \leq 100)$ and f $(0 < f \leq 10000)$. The unit of L is meter and the unit of f is $meter/second^2$. The input is terminated by a single line whose value of L and f is zero.

Output

For each line of input except the last one produce one line of output. Each line contains two floating-point number v and *volume* separated by a single space. Here v is the velocity for which traffic flow is maximal and *volume* is the maximum number of vehicles (of course it is a fraction) passing through the road in an hour. These two floating points should have eight digits after the decimal. Errors less than $1e-5$ will be ignored.

Sample Input

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5 3
0 0
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Sample Output

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5.47722558 1971.80120702
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