Week #1

A. Make a triangle!

2 seconds, 256 megabytes

Masha has three sticks of length a, b and c centimeters respectively. In one minute Masha can pick one arbitrary stick and increase its length by one centimeter. She is not allowed to break sticks.

What is the minimum number of minutes she needs to spend increasing the stick's length in order to be able to assemble a triangle of positive area. Sticks should be used as triangle's sides (one stick for one side) and their endpoints should be located at triangle's vertices.

Input
The only line contains tree integers a, b and c ($1 \le a, b, c \le 100$) — the lengths of sticks Masha possesses.

Output
Print a single integer — the minimum number of minutes that Masha needs to spend in order to be able to make the triangle of positive area from her sticks.

input
3 4 5
output
0

input
2 5 3
output
1

input
100 10 10
output
81

In the first example, Masha can make a triangle from the sticks without increasing the length of any of them.

In the second example, Masha can't make a triangle of positive area from the sticks she has at the beginning, but she can spend one minute to increase the length 2 centimeter stick by one and after that form a triangle with sides 3, 3 and 5 centimeters.

In the third example, Masha can take 33 minutes to increase one of the 10 centimeters sticks by 33 centimeters, and after that take 48 minutes to increase another 10 centimeters stick by 48 centimeters. This way she can form a triangle with lengths 43, 58 and 100 centimeters in 81 minutes. One can show that it is impossible to get a valid triangle faster.

B. Supermarket

2 seconds, 256 megabytes

We often go to supermarkets to buy some fruits or vegetables, and on the tag there prints the price for a kilo. But in some supermarkets, when asked how much the items are, the clerk will say that a yuan for b kilos (You don't need to care about what "yuan" is), the same as a/b yuan for a kilo.

Now imagine you'd like to buy m kilos of apples. You've asked n supermarkets and got the prices. Find the minimum cost for those apples.

You can assume that there are enough apples in all supermarkets.

Input
The first line contains two positive integers n and m ($1 \le n \le 5\,000$, $1 \le m \le 100$), denoting that there are n supermarkets and you want to buy m kilos of apples.

The following n lines describe the information of the supermarkets. Each line contains two positive integers a, b ($1 \le a, b \le 100$), denoting that in this supermarket, you are supposed to pay a yuan for b kilos of apples.

Output
The only line, denoting the minimum cost for m kilos of apples. Please make sure that the absolute or relative error between your answer and the correct answer won't exceed 10^{-6}.

Formally, let your answer be x, and the jury's answer be y. Your answer is considered correct if $\frac{|x-y|}{\max(1,|y|)} \le 10^{-6}$.

input
3 5 1 2 3 4 1 3
output
1.66666667

input
2 1 99 100 98 99
output
0.98989899

In the first sample, you are supposed to buy 5 kilos of apples in supermarket 3. The cost is $5/3$ yuan.

In the second sample, you are supposed to buy 1 kilo of apples in supermarket 2. The cost is $98/99$ yuan.

C. Fafa and his Company

1 second, 256 megabytes

Fafa owns a company that works on huge projects. There are n employees in Fafa's company. Whenever the company has a new project to start working on, Fafa has to divide the tasks of this project among all the employees.

Fafa finds doing this every time is very tiring for him. So, he decided to choose the best l employees in his company as team leaders. Whenever there is a new project, Fafa will divide the tasks among only the team leaders and each team leader will be responsible of some positive number of employees to give them the tasks. To make this process fair for the team leaders, each one of them should be responsible for the same number of employees. Moreover, every employee, who is not a team leader, has to be under the responsibility of exactly one team leader, and no team leader is responsible for another team leader.

Given the number of employees n, find in how many ways Fafa could choose the number of team leaders l in such a way that it is possible to divide employees between them evenly.

Input
The input consists of a single line containing a positive integer n ($2 \le n \le 10^5$) — the number of employees in Fafa's company.

Output
Print a single integer representing the answer to the problem.

input
2
output
1

input
10
output
3

In the second sample Fafa has 3 ways:

- choose only 1 employee as a team leader with 9 employees under his responsibility.
- choose 2 employees as team leaders with 4 employees under the responsibility of each of them.
- choose 5 employees as team leaders with 1 employee under the responsibility of each of them.

D. Reconnaissance

2 seconds, 256 megabytes

According to the regulations of Berland's army, a reconnaissance unit should consist of exactly two soldiers. Since these two soldiers shouldn't differ much, their heights can differ by at most d centimeters. Captain Bob has n soldiers in his detachment. Their heights are $a_1, a_2, ..., a_n$ centimeters. Some soldiers are of the same height. Bob wants to know, how many ways exist to form a reconnaissance unit of two soldiers from his detachment.

Ways $(1, 2)$ and $(2, 1)$ should be regarded as different.

Input

The first line contains two integers n and d ($1 \le n \le 1000, 1 \le d \le 10^9$) — amount of soldiers in Bob's detachment and the maximum allowed height difference respectively. The second line contains n space-separated integers — heights of all the soldiers in Bob's detachment. These numbers don't exceed 10^9.

Output

Output one number — amount of ways to form a reconnaissance unit of two soldiers, whose height difference doesn't exceed d.

input
5 10 10 20 50 60 65
output
6

input
5 1 55 30 29 31 55
output
6

E. Count The Pairs(Easy)

1 second, 256 megabytes

Given an array of N numbers, count the number of ordered pairs of indices i, j such that $i \neq j$, $1 \le i < j \le N$ and $a[i] + a[j] == min(a) + max(a)$ i.e. the sum of those two numbers equals the sum of both the minimum and maximum numbers in the array.

Input

The first line of input contains one integer N such that $1 \le N \le 5000$ the number of elements in the array The second line contains N space-separated integers each $1 \le a[i] \le 10^9$

Output

print the answer in one line, the number of ordered pairs of indices such that the sum of their two values equals the sum of the maximum + minimum numbers in the given array.

input
8 1 4 2 5 6 6 8 8
output
3

input
8 1 2 4 5 5 6 10 10
output
4