



Greetings From Globussoft

- ❖ Given below are 5 Programming questions, you have to solve any 3 out of 5 questions.
- ❖ These 5 questions you can attempt in any technology like C/C++, java, .Net, PHP
- ❖ To solve these 3 questions you've max. 3 hours.
- ❖ While Solving these questions you are not allowed to use any Search Engine like Google, Yahoo, Bing ...

All the best for your test

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QUESTION - 1

You are given a set of N sticks and are required to partition them into groups of exactly 3 sticks each. While doing so, you can leave out any number of sticks out of these groups (in particular, no groups may be formed). One condition needs to be met: sticks in each group need to form a triangle. A triangle can be constructed if sum of any two sticks lengths is greater than the third length.

You are required to partition the sticks so that the sum of triangle areas from all the groups is maximized.

Input

Very first line of the input contains integer T : number of test cases ($1 \leq T \leq 5$).

For each test case, first line contains integer N : number of sticks. ($1 \leq N \leq 15$).

Second line contains N space separated integers: the lengths l_i of the sticks. ($1 \leq l_i \leq 10^3$, $1 \leq i \leq N$).

Output

For each test case, output the maximal area in a separate line. Round value to exactly 6 decimal places. **Always** print exactly 6 decimal places.

Example

Input:

```
3
3
7 8 5
4
7 8 6 3
3
7 2 1
```

Output:

```
17.320508
20.333163
0.000000
```

QUESTION – 2

Once upon a time there lived a king in a far far country. In the country, there are n cities and m roads. He was severely attacked by his enemy. The enemy damaged all the cities of King's country. As the roads between the cities had been damaged, the King wanted to repair those. So he decided to launch a tender for this.

As King's country is a well managed country. By well managed country, we mean that it is possible to go from each city to any other city. But now as the city has been destroyed by enemies, all the roads are broken, the king will like to rebuild the roads in such a way that it is still a well managed country.

Cost of repairing the road in the country is really wierd, it is not addition of costs but it is instead multiplication of those. What it means that if the king decides that he should repair 5 roads, then total cost of repairing those roads will be multiplication of all the 5 costs.

As the King's treasure has been damaged by the attack of foreign city, he would like to spend minimum amount of money and that the will want that his country still remains well managed country. Surprisingly the company that was given tender had a rule that all the costs will be in powers of two, as they were really love with binary numbers.

As value of the total cost can be really large. We do not want to know the actual cost, instead output number of divisors of the number.

Input

T: number of test cases ($T \leq 5$)
 n and m ($n \leq 10^5$ && $m \leq 2 * 10^5$)

Next m lines will have a, b, c , which denotes that cities a and b are connected with road of cost c .

($c \geq 2$ && $c \leq 10^{18}$ && c will always be power of 2) ($1 \leq a \leq n$) and ($1 \leq b \leq n$)

Output

For each test case, output a single line containing a number as stated in the problem..

Example

Input:

4

2 1

1 2 16

3 2

2 3 32

1 2 16

3 3

2 3 32

1 2 16

1 3 64

5 5

1 2 2

2 3 2

1 3 4

3 4 16

3 5 8

Output:

5

10

10

10

QUESTION – 3

Feluda likes strings and mathematics very much. As Feluda is still a child, he was only recently introduced to concept of powers. Being a novice guy, he thinks about powering strings as well as numbers. He defines A^n (A powered to n) to be $A + A + \dots + A$ which is a concatenation of n copies of A. For example $"bhupkas"^2 = "bhupkasbhupkas"$.

He wants to check if given two strings A and B, can he find such positive integers n and m so that $A^n = B^m$. We are only interested in YES/NO answer, no need to give n and m values.

Input

First line contains integer T: number of test cases ($T \leq 100$).

Single line per test case containing strings A and B. Both will be non-empty, of lengths of at most 10^5 , composed only of lower case letters.

Output

For each test case, output "YES" if it possible to find integers n and m so that $A^n = B^m$ or "NO" otherwise (quotes for clarity).

Example

Input:

```
3
a a
ab ba
praveen praveen
```

Output:

```
YES
NO
YES
```

QUESTION – 4

There are W white balls and B black balls in a bag. A magician is performing tricks by drawing balls from the bag.

In each step, the magician randomly removes any two balls from the bag. If the drawn balls are of the same color, he will put one white ball in the bag, otherwise he will put a black ball in it. The two drawn balls from the bag from the ball are discarded.

He keeps on doing the above tricks until there is only one ball remaining in the bag.

Given W and B , you have to determine the probability that the color of last ball remaining in the bag is black. You should print the answer with accuracy of upto 6 decimal digits.

Input

T : no of test cases ($1 \leq T \leq 10^4$)

For every test case W and B are given ($0 \leq W \leq 10^8$ and $0 \leq B \leq 10^8$ and $W + B \neq 0$)

Output

For each test case, output the probability as stated in the problem statement.

Example

Input :

2

1 1

1 2

Output :

1.000000

0.000000

QUESTION – 5

Byteen, Byteasar's wife, simply loves flowers. She has decided to have a garden near their house. Byteen is a perfectionist: she would like her garden to be square with sides parallel to North-South and East-West directions. Moreover, Byteen wants each corner of the garden to contain one of the N apple-trees growing nearby.

Byteasar has learned about his wife's plans just before the final match of the World Cup in soccer. He knows that his wife is keen about the garden and, therefore, that it must be created instantly. To save some time, he asked her what exactly is her dream location of the garden - he knows that Byteen will surely check all the possibilities before making a final decision. Help Byteasar to find out how much time he has left, assuming that checking a single location for the garden takes Byteen exactly one second.

Input

The first line of the input contains one integer N , $1 \leq N \leq 10^5$, the number of apple-trees growing near Byteen's and Byteasar's house. For simplicity, the locations of trees are given in a Cartesian coordinate system. Each of the following N lines contains two space-separated integers X_i and Y_i , $-10^6 \leq X_i, Y_i \leq 10^6$, the coordinates of the i -th apple-tree. No pair of coordinates appears in the input twice.

Output

Your program should print a single integer: the number of seconds Byteen will spend on checking all possible locations of the garden, each location containing apple-trees in all its corners.

Example

For the input data:

```
6
0 0
0 1
1 0
1 1
3 0
3 1
```

the correct result is:

```
1
```