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

Globussoft

QUESTION - 1

On Monday, the number of frosh were reduced in half. To further reduce the number of engineers to a manageable number, the following challenge was devised for the second day. Each of the students would have to take this challenge individually.

Each student would be placed at a vertex of perimeter fence of Waterloo (oh yeah, some background: to keep UofT's engineering Lady Godiva band out of Waterloo, a fence was erected surrounding the university. The fence just happens to be an N-gon). At some other vertex along the fence would be located a temptation so seductive that no Waterloo student could resist – an extra-credit assignment. The challenge of each student is to go from his starting vertex to the vertex with the prize. There are however 3 rules:

a) The student can only travel from vertex to vertex (backwards or forwards) along the polygonal fence.

b) The student has to make contact with exactly K vertices (the vertex he starts at doesn't count unless he returns to it). The K vertices need not be unique. The final vertex has to be the one with the prize.

c) If the student cannot reach the prize and make contact with exactly K vertices, he fails the test and is kicked out of the university.

Of course, no Waterloo student is satisfied with only 1 solution to any problem. Therefore, inevitably, each student determines all ways that he/she can win. Note that there may be no solution to the problem (the astute student has figured out that this will result in a class size of 0 – this is entirely allowable as the variable used to quantify enrollment was incorrectly defined as a whole number instead of a natural number).

Input

N K (N, K <= 50)
A B (A = the starting vertex number, B = destination vertex number)
-1 -1 terminates input

Output

The total number of ways of reaching the destination from the starting point by following the above rules. The total number of ways will be less than $2^{63} - 1$. Output 0 if there are no solution.

Example

```
Input:
8 5
1 4
-1 -1
```

Output:
6

QUESTION – 2

Today, Gerrob's RSA company has featured a New RSA cryptosystem: its public key is n, the secret keys are three distinct primes p, q and r, where $n=p*q*r$. Note that the ordinary RSA uses only 2 primes! Unfortunately some hackers have stolen a DVD from the company. It does not store the secret keys, only some information about the system, namely, the values of:
$\varphi(n)$ - Euler's totient function and
$\sigma(n)$ - the sum of the divisors.
Obviously you know also n, because that's public.

Now, Gerrob's RSA employees are trying to determine if hackers will be able to break the system. Could you help them to answer this question?

Input

The first line contains a single integer T, the number of test cases, where $T \leq 20000$. The following T lines each contains three numbers n, $\varphi(n)$ and $\sigma(n)$ in this order. There are 5 input sets.

Output

Output T lines, the values of p, q and r in increasing order. It is guaranteed that p, q, $r<10^6$.

Example

Input:
```
4
30 8 72
61321 54912 68040
451464315257 451286179344 451642497600
91896729624994213 91896040105364880 91897419147616160
```
Output:
```
2 3 5
13 53 89
6397 8039 8779
231859 574261 690187
```

QUESTION – 3

Stancu likes space travels but he is a poor software developer and will never be able to buy his own spacecraft. That is why he is preparing to steal the spacecraft of Petru. There is only one problem – Petru has locked the spacecraft with a sophisticated cryptosystem based on the ID numbers of the stars from the Milky Way Galaxy. For breaking the system Stancu has to check each subset of four stars such that the only common divisor of their numbers is 1. Nasty, isn't it?

Fortunately, Stancu has succeeded to limit the number of the interesting stars to N but, any way, the possible subsets of four stars can be too many. Help him to find their number and to decide if there is a chance to break the system.

Input

In the input file several test cases are given. For each test case on the first line the number N of interesting stars is given ($1 \leq N \leq 10000$).

The second line of the test case contains the list of ID numbers of the interesting stars, separated by spaces. Each ID is a positive integer which is no greater than 10000. The input data terminate with the end of file.

Output

For each test case the program should print one line with the number of subsets with the asked property.

Sample

```
Input :
4
2 3 4 5
4
2 4 6 8
7
2 3 4 5 7 6 8
Ouput:
1
0
34
```

QUESTION – 4

Johnny is playing with some dominoes one afternoon. His dominoes come in a variety of heights and colors.

Just like any other child, he likes to put them in a row and knock them over.
He wants to know something: how many pushes does it take to knock down all the dominoes?
Johnny is lazy, so he wants to minimize the number of pushes he takes.
A domino, once knocked over, will knock over any domino that it touches on the way down.

For the sake of simplicity, imagine the floor as a one-dimensional line, where 1 is the leftmost point. Dominoes will not slip along the floor once toppled. Also, dominoes do have some width: a domino of length 1 at position 1 can knock over a domino at position 2.
For the mathematically minded:
A domino at position x with height h, once knocked over to the right, will knock all dominoes at positions x+1, x+2, ..., x+h rightward as well.
Similarly, the same domino knocked over to the left will knock all dominoes at positions x-1, x-2, ..., x-h leftward.

Input

The input starts with a single integer N ($N \leq 100000$), the number of dominoes, followed by N pairs of integers.
Each pair of integers represents the location and height of a domino, in that order ($0 \leq$ location $\leq 10^9$, $0 \leq$ height $\leq 10^9$).
No two dominoes will have the same location.

Output

A single integer on a single line: the minimum number of pushes Johnny must make in order to ensure that all dominoes are knocked over.

Example

Input:
```
6
1 1
2 2
3 1
5 1
6 1
8 3
```
Output:
```
2
```

QUESTION – 5

There is a competition of flying hamsters in Hamsterburg. Each competing hamster is thrown from a sling. The judges rate the flight according to its length and height. Let X meters be the distance of the flight, and Y meters – maximum height to which the hamster rose during the flight. The hamster will receive K1*X + K2*Y points for such a flight. The initial speed of the hamsters is V0 m/s. Free fall acceleration is g = 10 m/s^2. There is no air friction. The size of the

hamster and the sling are negligible. When the hamster is thrown from the sling its height is 0 meters. You should determine the angle at which the hamster must be thrown so that he receives maximum points.

Input

The first line of input contains number t – the amount of tests. Then t tests follow one per line. The description of each test consists of three integers separated by single spaces. The first integer is V0, the second – K1, the third – K2.

Constraints

1 <= t <= 10000
1 <= V0 <= 100
0 <= K1, K2 <= 1000
0 < K1 + K2

Output

For each test output the angle in radians at which the hamster must be thrown, and the amount of points it will receive. The numbers should be separated with spaces. Print the numbers with exactly three digits in the fractional part.

Example

Input:

```
3
10 10 0
10 0 10
10 10 10
```

Output:

```
    0.785 100.000
1.571 50.000

    0.908 128.078
```