

## Problem A. Number Reconstruction

Input file:            `standard input`  
Output file:         `standard output`  
Time limit:          1 second  
Memory limit:       256 megabytes

Meow is fascinated with numbers. One day, bored at class, he started jotting down numbers on his textbook. With no particular reason, he only writes down numbers with 3 digits or above, denoted as  $N$ . He chops off the last digit of the number and then forms a new number,  $M$ . Then he performed a mathematical operation:  $S = N - M$ , and then he tells you  $S$ .

Later, you found out that the number  $N$  is actually a super magical number that is the solution to life, the universe, and everything. Can you figure the number out?

### Input

The first line contains a single integer  $t$  ( $1 \leq t \leq 1000$ ) – the number of test cases.

Each test cases contains a single positive integer,  $S$  ( $100 \leq S \leq 10^{17}$ )

### Output

For each test case, output a line containing the possible values for  $N$ . If there exists multiple possible values, output all in ascending order separated by a single space.

### Example

standard input	standard output
3	111
100	555
500	1999 2000
1800	

## Problem B. Covid

Input file:            **standard input**  
Output file:           **standard output**  
Time limit:            2 seconds  
Memory limit:         256 megabytes

Since the emergence of Omicron, which is one of the Covid-19 variant, it has spread towards many countries in a short amount of time and our Ministry of Health (MOH) are concerned about its extremely high transmission rate.

Therefore, they ask your help as a developer that are working in health industry to write a program that act as a scanner to scan and cluster the people infected by Covid-19 virus or Omicron among a group of  $nn$  people which also include healthy people.

If the size of the largest **Covid-19 cluster is greater than Omicron cluster**, your program should alert MOH to focus on Covid-19 cluster. If the size of the largest **Omicron cluster is greater than or equal to Covid-19 cluster**, your program should alert MOH to focus on Omicron cluster as they can spread easily compared to Covid-19. Your program should only cluster the people infected by Covid-19 or Omicron horizontally or vertically (4-connected).

### Input

The first line of input contains an integer  $t$  ( $1 \leq t \leq 100$ ) - the number of test cases.

The first line of each test case contains an integer  $n$  ( $6 \leq n \leq 100$ ) - the size of a group of people to be scanned.

In the subsequent line of every test case contain inputs for  $n \times n$  integers  $a$  ( $0 \leq a_{ij} \leq 2$ ).

$a_{ij} = 0$  represents healthy people.

$a_{ij} = 1$  represents people infected by Covid-19.

$a_{ij} = 2$  represents people infected by Omicron.

### Output

For every test case, output "MOH should focus on Covid-19" if the size of largest Covid-19 cluster is greater than the largest Omicron cluster. Output "MOH should focus on Omicron" if the size of largest Omicron cluster is greater than or equal to the largest Covid-19 cluster.

### Example

standard input	standard output
2	MOH should focus on Covid-19
6	MOH should focus on Omicron
0 0 2 2 0 0	
1 0 2 2 1 1	
1 2 1 1 0 2	
1 0 1 1 2 2	
1 0 1 2 0 1	
2 0 2 0 0 0	
7	
0 0 0 0 1 0 0	
0 2 2 2 1 1 2	
0 0 0 1 1 2 0	
1 0 0 2 2 2 1	
2 2 0 0 1 2 0	
0 1 0 0 1 2 1	
1 1 0 0 1 2 0	

## Note

In the first test case, the largest Covid-19 cluster has a size of 5 while the largest Omicron cluster has a size of 4, thus we should print "MOH should focus on Covid-19".

In the second test case, the largest Omicron cluster has a size of 7 while the largest Covid-19 cluster has a size of 5, thus we should print "MOH should focus on Omicron".

## Problem C. Meow's Pizzeria

Input file:            **standard input**  
Output file:         **standard output**  
Time limit:          1 second  
Memory limit:       256 megabytes

Meow has decided to open a pizzeria with his friend after the Movement Control Order (MCO) had been lifted by the government. Since they were still having difficulty hiring other workers, they have decided to deliver the pizzas themselves. Meow and his friend, Miao have decided to take turns delivering the pizzas and they have implemented a tip jar. Customers will tip the delivery man based on his service.

After a bit of discussion, it has been decided that Meow and Miao will deliver according to who will get more tip money from that respective delivery. They have also come to a consensus that all the orders would be distributed in a way where they are able to get more tips. One order will be handled by only one person.

Also, due to time constraints, Meow cannot take more than  $X$  orders and Miao cannot take more than  $Y$  orders. It is guaranteed that  $X + Y$  is greater than or equal to the total number of orders received that day, which means that all the orders can be handled by either Meow or his friend. How much is the maximum possible value of tips that Meow's pizzeria can earn in total after processing all the orders?

### Input

The first line contains 3 positive integers –  $N$  ( $2 \leq N \leq 10^5$ ),  $X$ , and  $Y$  – the number of orders, the maximum order Meow can take, the maximum order Miao can take, respectively. ( $1 \leq X, Y \leq N$ ;  $X + Y \geq N$ )

The second line contains  $N$  integers  $x_1, x_2, \dots, x_n$  ( $1 \leq x_i \leq 10^4$ ) – the tip that Meow could possibly receive for order  $i$ .

The third line contains  $N$  integers  $y_1, y_2, \dots, y_n$  ( $1 \leq y_i \leq 10^4$ ) – the tip that Miao could possibly receive for order  $i$ .

### Output

Print the maximum tip money they would receive.

### Examples

standard input	standard output
5 3 3 1 2 3 4 5 5 4 3 2 1	21
5 1 4 5 4 3 100 5 1 1 1 1 1	104

## Problem D. Line Intersection

Input file:            **standard input**  
Output file:          **standard output**  
Time limit:           **2 seconds**  
Memory limit:        **256 megabytes**

Meow is given  $N$  number of lines. All lines are not collinear and are not extendable. Without drawing the Cartesian Plane, Meow wants to know whether all lines intersect each other. Can you help Meow?

### Input

The first line contains a single integer  $N$  ( $2 \leq N \leq 1000$ ) – the number of lines.

The program reads following  $N$  lines containing 4 space-separated floats,  $X_1, Y_1, X_2, Y_2$  ( $-10^9 \leq X_i, Y_i \leq 10^9$ ), representing 2 endpoints of a line  $(X_1, Y_1), (X_2, Y_2)$ .

### Output

Print "True" if all lines intersect, else "False".

### Examples

standard input	standard output
5 -1 -1 5 5 1 5 5 1 1 3 8 3 2.5 0 2.5 5 -2 -1 8 4	True
2 0 0 1 3 5 6 9 17	False

## Problem E. Exploit Resources

Input file:            **standard input**  
Output file:         **standard output**  
Time limit:          1 second  
Memory limit:       256 megabytes

Meow drives a spaceship with a drill and fly over  $n$  planets, in sequence of increasing order. The spaceship initially has a power level of  $l$ .

Planets are divided into two categories: resource-based and maintenance-based. Assume of current power level of the drill as  $p$ .

1. Resource based: It contains mineral content  $a_i$   
If you choose to mine, you will get  $a_i \times p$  money, and then the drill bit power level will degrade by  $k\%$ , that is,  $p = p \times (1 - 0.01k)$ .
2. Maintenance based: It contains maintenance fee  $b_i$   
If you choose maintenance, you will pay  $b_i \times p$  money, and then the drill will be repaired by  $c\%$ , that is,  $p = p \times (1 + 0.01c)$ .

Note: The power level of the drill bit can exceed the initial value after repair (you can think of it as refurbishment + upgrade). Furthermore, money can be overdrawn.

As the captain of the spaceship, Meow would like to know his maximum income.

### Input

The first line of the input contains 4 integers  $n, k, c, l$ , representing the number of planets, drill degradation rate, drill reparation rate, and initial drill power level, respectively. ( $0 \leq n \leq 100000; 0 \leq k, c, l \leq 100$ )

The next  $n$  lines contain two integers, type of planet,  $type$  and the value for that planet,  $value$ .

1.  $type = 1$  means resource-based,  $value$  is its mineral content  $a_i$ . ( $0 \leq a_i \leq 100$ )
2.  $type = 2$  means maintenance-based,  $value$  is its maintenance fee  $b_i$ . ( $0 \leq b_i \leq 100$ )

### Output

Output the maximum possible income for Meow, print your answer with accuracy up to 2 decimal places, rounded off. It is guaranteed that the answer is less than  $10^9$ .

### Example

standard input	standard output
5 50 50 10 1 10 1 20 2 10 2 20 1 30	375.00