

Problem A. Sum from 1 to N (easy)

Program: `fromv1.(c|cpp|java|py)`
Input: `fromv1.in`
Balloon Color: `Blue`

Here is a problem that will maybe teach you something.

You will be given an integer N , can you calculate the sum of all numbers from 1 to N like the following:

If N is equal to 5, you are to print the result of $1 + 2 + 3 + 4 + 5$ which is 15.

Input

The input will consist of several test cases and the number of test cases ($1 \leq T \leq 100$) will be given in the first line of the input then T test cases follow.

Each test case will consist of one integer ($1 \leq N \leq 10^6$).

Output

For each test case, print one line containing the sum of all integers from 1 to N and since the sum will be big, make the result modulus 1000000007 or as we say mathematically $10^9 + 7$ ie.(output `res%1000000007`)

Example

fromv1.in	Standard Output
2	15
5	55
10	

Problem B. Sum from 1 to N (hard)

Program: `fromv2.(c|cpp|java|py)`
Input: `fromv2.in`
Balloon Color: `Yellow`

Here is a problem that will maybe teach you something.

You will be given an integer N , can you calculate the sum of all numbers from 1 to N like the following:

If N equals to 5, you are to print the result of $1 + 2 + 3 + 4 + 5$ which is 15.

This problem is not like the previous one, you will find the difference in the input section and judges responses.

Input

The input will consist of several test cases and the number of test cases ($1 \leq T \leq 100$) will be given in the first line of the input then T test cases follow.

Each test case will consist of one integer ($1 \leq N \leq 10^9$).

Output

For each test case, print one line containing the sum of all integers from 1 to N and because the sum will be big, make the result modulus 1000000007 or as we say mathematically $10^9 + 7$ ie.(output `res%1000000007`)

Example

fromv2.in	Standard Output
2	15
5	55
10	

Problem C. Mission Graduation

Program: `graduation.(c|cpp|java|py)`
Input: `graduation.in`
Balloon Color: Red

Omar is a Computer Science student, he is smart but he hates studying. Therefore, after spending four years in college, he had a number of courses that he failed throughout the past years.

This year, Omar is determined to commit to studying and obtain his degree. However, he had failed X courses that are only given in the first term, and Y courses that are only given in the second term. Omar can only take at most six courses in a term, and he can't take a course unless it was given in its respected term.

Omar wants to finish his courses and obtain his degree in the minimum possible time. Given the courses he failed that are given in the first and second terms, and considering the rules mentioned above, can you find out the after how many terms Omar will finish all the courses and graduate? Assuming he passes every course he takes.

Input

The first line of the input contains a single integer T ($1 \leq T \leq 100$) — the number of test cases.

Each test case consists of a single line which contains X and Y ($1 \leq X, Y \leq 10^9$), the number of courses he failed that he can take in the first semester, and the number of courses he failed that he can take in the second semester respectively.

Output

For each test case, print a single integer, How many terms will take Omar to finish all the courses and graduate, while only taking a course in its given semester, and only taking six courses in a term at most.

Example

graduation.in	Standard Output
3	2
5 5	4
1 7	3
7 1	

Problem D. Chemistry

Program: `chemistry.(c|cpp|java|py)`
Input: `chemistry.in`
Balloon Color: `green`

Alaa is a student in the Institute of Applied Chemistry, and as we all know, Alaa is very good in solving Chemistry problems. One of the professors in that institute has heard about Alaa so, he decided to challenge him by giving him a very complex Chemistry problem about molecules.

The problem says: You have a molecule that consists of N atoms, and there exists a chemical bond between every two distinct atoms. In other words, each atom forms a chemical bond with all of the other atoms in that molecule, and each atom has a chemical value V_i . The professor wants Alaa to remove all of the atoms one by one, but first, you have to know that removing an atom from the molecule requires energy and that energy is equal to the sum of the chemical values of the other atoms that still exist in the molecule.

Because of the limited resources in the laboratory where Alaa has to solve this problem, spending a large amount of energy will be too expensive ,so you have to help him calculate the minimum energy required to remove all of the atoms from that molecule.

Input

The first line of input will be the number of test cases T ($1 \leq T \leq 100$) followed by T test cases. Each test case consists of two lines, the first line contains a single value N ($2 \leq N \leq 10^5$), the number of atoms. The second line contains N space-separated integers, where the integer V_i ($1 \leq V_i \leq 100$) represents the chemical value of the i_{th} atom in the molecule.

Output

For each test case, print a single integer that represents the minimum amount of energy required to remove all the atoms from the molecule, and you have to print each integer in a separated line, and the output file ends with a new line too. print each integer **modulo 100**.

Examples

chemistry.in	Standard Output
1 7 1 5 6 6 7 7 9	94

Note

Large input file

Problem E. Google Chrome

Program: `chrome.(c|cpp|java|py)`
Input: `chrome.in`
Balloon Color: `white`

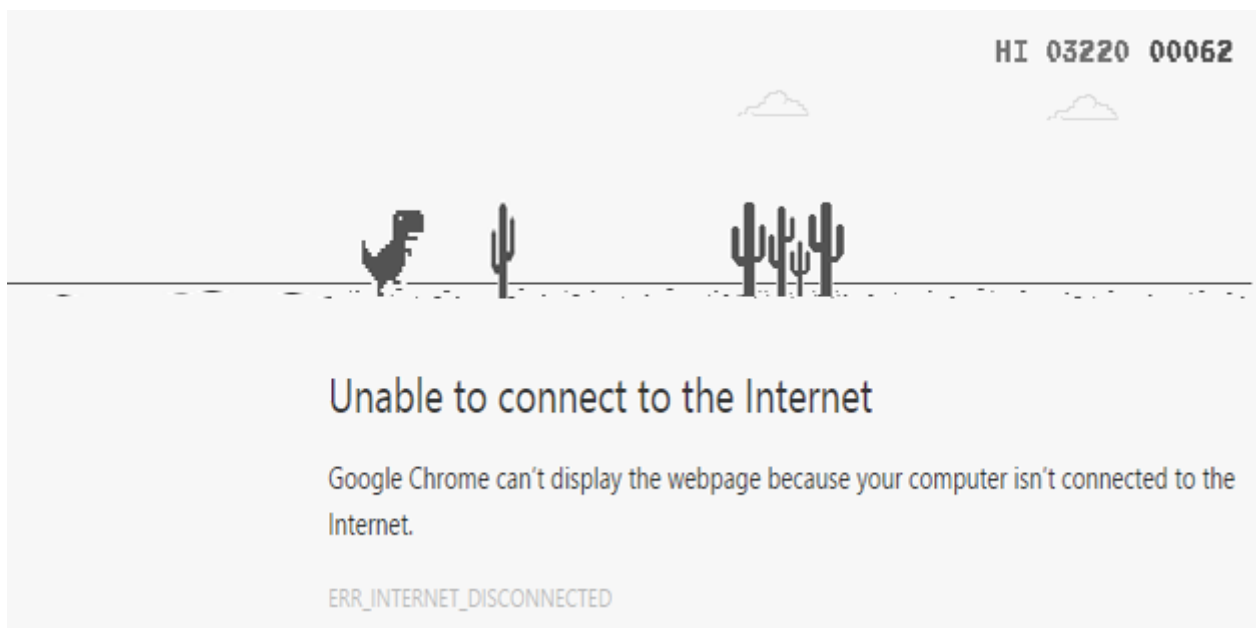
Google, one of the most important technology companies in the world, organizes activities in many domains supporting youths around the world. They also produce unique ideas and products. One of which will be our subject for this problem.

One of Google's many famous products is Google Chrome, a good web browser. They added a fun mini game that runs in the browser's window when you are not connected.

This game's hero is the Google Chrome character, which is a dinosaur (let's call him "GoGo") that runs through a straight line in a desert facing some plants distributed randomly along the way. GoGo must jump over these plants to avoid a deadly collision with them.

Your goal in this game is to make GoGo continue to jump as far as it can get, until it hits a plant and "Game over" is displayed. The furthest GoGo gets, the higher the score you achieve.

However, we don't want GoGo to always die, we want to reduce the number of times it dies in some way. The most common way of losing the game when GoGo jumps continuously is when it falls directly on a plant, which is a situation we want to avoid.



Let's consider the following rules :

- We will apply our solution to an instant of the game, therefore, we can consider that GoGo has a constant speed as well as a constant jump distance.
- To avoid other "Game over" situations, we will consider the length of the plants to be **0**, which means that GoGo dies only when it lands directly on the top of the plant. It can't hit the plant from the side.
- GoGo can start to jump at any point between point 0 (which is the starting point of the game) and the point just before the first plant it encounters.
- When GoGo starts to jump, it never stops until the game is over or until the plants are all behind it.

- The score that GoGo achieves is the position of the furthest plant it could reach before dying.
- GoGo and all plants have a width of 1.

Given the number of plants N , their positions and GoGo's jump distance K , find out the maximum score GoGo can achieve, or print "GoGo run away!" (capital 'G', small 'o' and without the quotes) if GoGo can manage to pass all the plants without dying.

Input

The first line of input contains a single integer T ($0 < T \leq 200$) – the number of test cases. T test cases follow.

Each test case consists of two lines. The first line contains two integers N and K ($0 < N \leq 50000$), ($0 < k \leq 16 \times 10^6$), the number of plants and GoGo's jump distance respectively.

The second line of each test case contains N integers, where X_i ($0 \leq X_i \leq 2 \times 10^9$) represents the position of the plant i .

Output

For each test case, print a line containing the position of the last plant GoGo can reach or print "GoGo run away!" without quotes if GoGo can pass all the existing plants.

Examples

chrome.in	Standard Output
2	9
5 3	GoGo run away!
4 5 7 9 11	
3 4	
28 35 40	

Note

Large input file