



DIU Take-Off Programming Contest

Spring 2020

[Main Round]

Organized By



Problem Set

Platform Support



Problem Name	Setter Name	Reviewer
A. Heart of the Demon	Ahmed Abdullah Shourav	Md. Erfanul Islam, Riadh Hasan
B. Buy Two, Get One Free	Shah Habibul Imran	Rahat Islam Srijon
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J. Behold! The Stopper!!!	Md. Erfanul Islam	Tanima Hossain

A. Heart of the Demon

Time Limit: 1s

Memory Limit: 512 MB

Description:

“The weak have no rights or choices. Their only fate is to be relentlessly crushed by the strong!” – Giyu Tomioka

Muzan Kibutsuji is the Demon King, the first of his kind, as a being who has lived over thousands of years he becomes unimaginably strong with capabilities, he killed an innumerable number of people and turned some of them into Demon.

Since ancient times, the “Demon Slayer Corps” has existed to hunt down Demons. They are number in the hundreds, an organization completely unrecognized by the government.

In one demon attack, the full family of Tanjiro Kamado was destroyed, now the goal of his life is to kill *Muzan* to avenge his family. After years of extreme training in “Demon Slayer” finally he is ready to fight with *Muzan*.

Tanjiro finds out that *Muzan* can't be killed like other demons. The heart of *Muzan* is divided into N parts and placed in secret places with very strong protection. To kill *Muzan*, *Tanjiro* needs to collect all the parts of the heart and merge them all together, and stab in the middle of the heart with his sword.

All the parts of the heart are of a distinct size so each part of the heart can be represented with its size which is an integer number. If the heart is $\{7, 5, 3, 11, 2\}$ then to find the middle of the heart he has to find all the parts and merge them in increasing

order like {2, 3, 5, 7, 11}. Here the **middle element is the middle of the heart which is 5.**

Now, *Tanjiro* knows how to kill *Muzan* but if he fails there will be no other chance to kill *Muzan* in a thousand years. So, before the attack, *Tanjiro* needs to know **how much stamina he needs to merge the heart and what is the middle of the heart.**

The stamina he needs to find all the parts and merge them, for this heart {7, 5, 3, 11, 2} is 7.

Let's see how to calculate it,

What *Tanjiro* will do in each of his moves is, find the smallest part of the heart and take it, the stamina he needs for taking the part is the number of remaining parts in its left.

If the Heart is: {7, 5, 3, 11, 2}

Move-0: [{}: {7, 5, 3, 11, 2}] [starting the attack]

Move-1: [{2}: {7, 5, 3, 11}] [Takes the part 2 and stamina used is 4]

Move-2: [{2, 3}: {7, 5, 11}] [Takes the part 3 and stamina used is 2]

Move-3: [{2, 3, 5}: {7, 11}] [Takes the part 5 and stamina used is 1]

Move-4: [{2, 3, 5, 7}: {11}] [Takes the part 7 and stamina used is 0]

Move-5: [{2, 3, 5, 7, 11}: {}] [Takes the part 11 and stamina used is 0]

So, to merge this heart total stamina needed is $(4 + 2 + 1 + 0 + 0) = 7$ and the middle of the heart is 5.

Tanjiro performs best at fighting but struggles with math, so he needs assistance.

Now, as you are the best thinker of the Demon Slayer Corps, you have to find the stamina needed to merge the given heart and the middle of that heart.

Input

The first line of the input will contain a single integer N the number of the parts of the Heart. It is grunted that N is always a positive odd number and $0 < N < 10^6$. The next line will contain N integers where each of them is representing a part of the heart $1 \leq h_i \leq 10^9$.

Output

For the given information of the Heart, you have to output a single line with two integer total stamina and the middle of the heart.

Sample Input	Sample Output
5 7 5 3 1 1 2	7 5
7 1 2 3 4 5 6 7	0 4

Notes: Be careful about the newline('\n') at the end.

Problem Category: Pre-Stopper

Problem Setter: Ahmed Abdullah Shourav

Reviewer: Md. Erfanul Islam, Riadh Hasan

B. Buy Two, Get One Free

Time Limit: 1s

Memory Limit: 512 MB

Description:

During the Covid-19 pandemic, the members of the Demon Slayer Corps are relaxing at their own houses or at headquarters. Since the Demons are also in quarantine (they're immune to damage, but not to the Coronavirus 😊), the Demon Slayer Corps don't have any job.

Tanjiro, *Nezuko*, *Zenitsu*, and *Inosuke* are quarantining with *Shinobu* at her house. Today, *Tanjiro* remembers that he once promised *Nezuko* that he'll buy her a new *Kimono* (a traditional Japanese dress). So, he's now at the nearest shopping mall along with *Zenitsu* and *Inosuke* to buy a *kimono*. After roaming for a while from one shop to another, the three finally chose three beautiful *Kimonos*. They liked each of them very much and wished to buy them. But, they found out that with all the money they have, they can only buy two *Kimonos*.

Luckily, the shop has a special **buy two and get one free offer**. To get that offer, **the sum of the price of any two Kimonos must be odd**. The three Demon Slayers are very good at fighting demons, but terrible at math. So they ask their smart friend, you, to tell them whether they can get the offer or not.

Input

The only line of input will contain three integers A, B, and C indicating the price of the three *Kimonos*.

$$1 \leq A, B, C \leq 10^9$$

Output

You have to output a single line, “**3 Kimonos for Nezuko**” (without quotes) if they can buy all three Kimonos, or “**You have to choose two**” (without quotes) otherwise.

Sample Input	Sample Output
2 3 5	3 Kimonos for Nezuko
2 4 6	You have to choose two

Notes: Be careful about the newline(‘\n’) at the end.

Problem Category: If-else

Problem Setter: Shah Habibul Imran

Reviewer: Rahat Islam Srijon

C. Treat? Itadakimasu...

Time Limit: 1s

Memory Limit: 512 MB

Description:

So the fight against the demonized humans, who eat good humans, is raging on. And the cause for these human demonizations is none other than the Covid virus, created by the "Virus Mommy" **Muzan**. The demon slayer corps are now hunting Muzan. But at the same time, they have to deal with the demons as well. To kill them the slayers need a special type of Katana (a type of Japanese sword) created by special swordsmiths.

Maya-chan has joined the slayers as an assistant to **Haganezuka oji-san**, a famous swordsmith. Immediately after joining **Maya-chan** noticed a problem that almost all the swordsmiths struggle with. And the problem is determining the power level of the katanas. The calculation process of the power level is given below:

The katanas are made by mixing 4 different special types of elements each having a special power level. So after making a katana by mixing all the elements, to get the power level of the katana, first, one has to multiply all the 4 power levels of the elements. Then take the last 2 digits of the product of the 4 power levels.

Now depending on the acquired 2 digit number the power level of the Katana is determined as given below:

- If the acquired 2 digit number is in the range [00, 24] (inclusive), Then the Katana power is level 0.
- If the acquired 2 digit number is in the range [25, 49] (inclusive), Then the Katana power is level 1.
- If the acquired 2 digit number is in the range [50, 74] (inclusive), Then the Katana power is level 2.
- If the acquired 2 digit number is in the range [75, 99] (inclusive), Then the Katana power is level 3.

Now Maya-chan wants your help to write a program that can calculate the power level of the katanas and make the lives of the swordsmiths easier. She also informs you that **the magic word to solve this problem is “Itadakimasu” (a Japanese word) and the right Breathing Technique.** 😊

Oh!!! Almost forgot about the **Treat** prepared for you to motivate you to do the task. Here it is:

What do you get when you divide a number by 100 and take the remainder? (Consider large numbers for better understanding)

Not satisfied yet? Well here’s another one.

Once upon a time while doing something a certain someone found out that,

$$(a \times b) \% \text{mod} = ((a \% \text{mod}) \times (b \% \text{mod})) \% \text{mod}$$

Don’t believe it? then,

Calculate $(107 \times 222) \% 100$ and again calculate $((107 \% 100) \times (222 \% 100)) \% 100$... Found anything?

What? still don’t like the treat? Well..... Like it or not, it’s a pretty amazing treat. So why don’t you just dig in saying **“Itadakimasu”** out loud?

Input

4 **non-negative** integer numbers will be given on a single line separated by spaces. None of the integers will be greater than 10^9 .

Output

Output contains a single line **“level X”** (without quotes), where **X** is the level of the Katana. See the sample output for details.

Sample Input	Sample Output
2 3 4 8	level 3
1 1 1 1	level 0

In the first test case, after multiplying the numbers we get, $2 \times 3 \times 4 \times 8 = 192$. By taking the last 2 digits of 192 we get 92. which is in the range [75-99]. So the power level is 3.

Notes: Be careful about the newline('\n') at the end.

Problem Category: if-else+math

Problem Setter: Nazmus Sakib

Reviewer: Md. Albin Hossain

D. Vaccination in BDesh

Time Limit: 1s

Memory Limit: 512 MB

Description:

BDesh is a very peaceful country with a smaller population. Recently a **Spider Demon** with a dangerous kind of venom found in BDesh. Spider Demon pushed his venom into people's veins and the people became spider-people. I know you are scared.

But don't worry, BDesh has a very talented and furious health minister named **Zenitsu Agatsuma**. He has some psychic power, and using these powers *Zenitsu* somehow manages to kill the Spider Demon.

Ahh! people are relaxed now and cheering *Zenitsu*. But the people who already are a spider-people still haven't recovered. To change these spiders into people, *Zenitsu* tries psychic power again but fails. After a long time, *Zenitsu's* friend named **Shinobu Kochu** came with the glorious news that she invented a vaccine to recover these people. Now it's time to start the vaccination. The process lasted for N days.

After starting the vaccination process it is observed that on i -th day if a_i spider-people come to take vaccine they can only vaccinate X_i number of spider-people and get them fully recovered on that day where X_i is the largest multiple of K which less or equal to a_i and the remaining become spider-people forever.

You're given N integers where a_i is the number of spider-people who came to take the vaccine on i -th day. Your task is to **determine how many people become spider-people forever from not getting vaccinated if they vaccinate as many people as possible.**

Input

The first line will be a single integer T indicating the number of test cases. Each of the test cases will contain two integers N and K . Then the next line will contain N integers $a_1, a_2, a_3, \dots, a_n$ the number of vaccinated people each day.

$$1 \leq T \leq 10$$

$$1 \leq N, K \leq 100$$

$$1 \leq a_1, a_2, a_3, \dots, a_n \leq 1000$$

Output

You have to output T lines in the format “**Case X: Y**”(without quotes) where X is the number of test cases and Y is the total number of people who will become permanently spider-people.

Sample Input	Sample Output
2 5 4 5 100 1 12 15 3 1 13 22 1	Case 1: 5 Case 2: 0

In the first case,

On the first day, the maximum number of people who can get a vaccine is 4.

On the second day, everyone can get a vaccine as 100 itself is a multiple 4.

On the third day, no one can get a vaccine as the largest multiple of 4 less than or equal to 1 is 0.

On the fourth day, everyone can get a vaccine as 12 itself is a multiple of 4. Finally, on the fifth day, only 12 people can get a vaccine as it is the largest multiple of 4 less than or equal to 15.

Notes: Be careful about the newline('\n') at the end.

Problem Category: Loop

Problem Setter: Md. Shameem Alam

Reviewer: Ahmed Abdullah Shourav

Special Thanks: Tanima Hossain, Md. Erfanul Islam

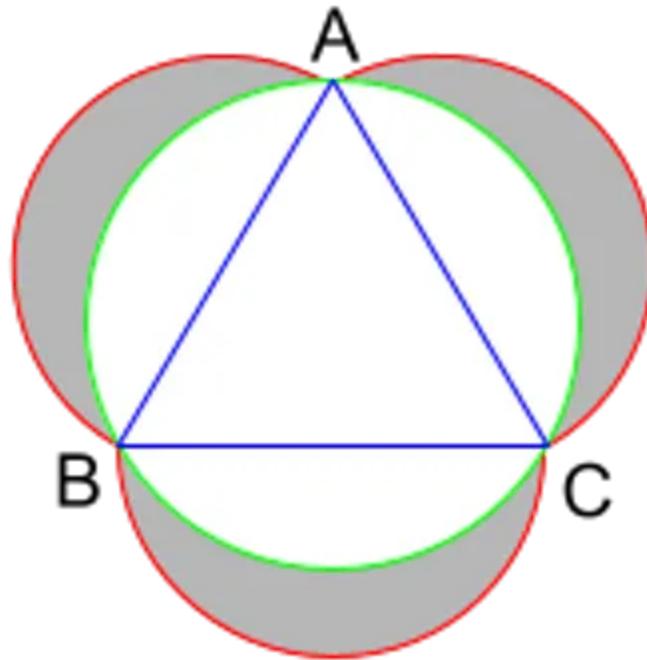
E. Bored in Box

Time Limit: 1s

Memory Limit: 512 MB

Description:

After becoming a demon, *Nejuko* can't go out in the sunlight. Most of the daytime she stays in a box. Though she never complained, this is extremely boring to her. After all, why a demon (or human) would like to live in such a tiny box alone! That's why her elder brother *Tanjiro* decides to give her a problem to solve to bring some excitement.



Tanjiro drew an **equilateral triangle** ABC with its **circumcircle**. Then he drew **three half circles each based on exactly the sides of the triangle**. Finally, he got a figure like below.

Now *Tanjiro* gives the **length of the side AB** of the triangle and asks *Nejuko* to **find out the area of the dark shaded region**.

After trying for some times, *Nejuko* was almost close to the solution, she derived that the **area of the given triangle** is equal to $\frac{\sqrt{3}}{4}BC^2$ and **circumradius** of the given triangle is equal to $\frac{BC}{\sqrt{3}}$.

After doing this much stuff *Nejuko* started feeling tired. She needs to sleep now to gain some energy. Before going to sleep she asked you to solve the same problem.

She also said one more thing, **“You must use 3.14159 for the value of pi(π)”**.

Input

The input will contain only one integer AB, the length of the one side of the triangle.

$$1 \leq AB \leq 3 \times 10^4.$$

Output

You have to output the **area of the dark shaded region**. Your answer is considered correct if its absolute or relative error doesn't exceed 10^{-6} .

Sample Input	Sample Output
14	110.526807904208283
6	20.300842268119887

- An equilateral triangle is a triangle in which all three sides of the triangle have the same length.

-
- Circumcircle of a triangle is the minimum radius circle that passes through all the vertices of that triangle. Circumradius is the radius of a Circumcircle.
 - Half circles are exactly based on the sides of the triangle means the diameters of those half circles are equal to the respective sides of the triangle.

Notes: Be careful about the newline('\n') at the end.

Problem Category: Geometry

Problem Setter: Md. Albin Hossain

Reviewer: Md. Erfanul Islam

Special Thanks: Mahmud Sajjad Abeer

F. Tanjiro's Training With Kanao

Time Limit: 1s

Memory Limit: 256 MB

Description:

After the fight in the *Natagumo Mountain*, Tanjiro felt the need to get sharper. Because in recent fights he has been missing the opening threads which shortens the fight by allowing him to defeat an opponent in one blow through that opening thread. While staying in the *Butterfly Mansion*, Tanjiro gets help from the residents of the mansion to improve his ability to find an opening thread as soon as possible.

As he spars with one of the residents of *Butterfly Mansion*, *Kanao*, the three servants of the mansion are tasked with monitoring the sparring of *Tanjiro* and *Kanao*. One of the trio watches *Tanjiro*, one watches *Kanao* and the last one compiles the observations of the first two and takes it to *Shinobu*, host of the mansion.

What Shinobu gets is **two arrays of integers, A and B, of length m and n. The first one is the fighting strategy of Kanao and the second is Tanjiro's.** Shinobu observes the observations and **if she finds some(at least one) non-negative x and d, such that for every i (0 ≤ i < m), A[i] being the i-th element of A and B[x + i × d] being the (x + i × d)-th element of B, A[i] = B[x + i × d], stays the same, she will be ensured that Tanjiro found at least one opening.** After that Shinobu will stop the sparring session and tell Tanjiro, "*I can see you're working very hard.*", if Tanjiro found an opening, "*Please do all that you can.*", otherwise, **You have to tell what Shinobu will say to Tanjiro, based on the observation of the observations by the trio.**

Input

The first line of input contains m and n. Second-line contains m integers, denoting the fighting strategy array of Kanao, A and the third line contains n integers, denoting the fighting strategy array of Tanjiro, B.

$$1 \leq m \leq n \leq 100$$

The array elements will be positive and within 10^9 .

Output

You have to output a single line, **what Shinobu will say to Tanjiro (without quotes)**, based on the observation.

Sample Input	Sample Output
6 13 4 23 6 5 7 9 12 1 6 2 25 6 8 12 7 7 9 10 11	I can see you're working very hard.
4 10 7 1 9 8 1 2 3 4 5 6 7 8 9 10	Please do all that you can.

In the first case, if we take $x=2$ and $d=2$ and for every $i(0 \leq i < m)$, we get the following elements of array B by taking all the $(x + i \times d)$ -th element: 6, 25, 8, 7, 9, 11.

And the elements of array A are: 4, 23, 6, 5, 7, 9.

So here we can see that, $(4-6)=(23-25)=(6-8)=(5-7)=(7-9)=(9-11)$ So, we can say that an opening exists.

In second case, No such

x and d are found where for every $i(0 \leq i < m)$, $A[i]-B[x + i \times d]$, stays the same.

Notes: Be careful about the newline('\n') at the end.

Problem Category: Implementation

Problem Setter: Rahat Islam Srijon

Reviewer: Nazmus Sakib

Special Thanks: Md. Erfanul Islam

G. Inosuke and Trailing Zero

Time Limit: 1s

Memory Limit: 512 MB

Description:

Inosuke and *Tanjiro* are overjoyed because *Mr.Haganezuka* is bringing their sword of revenge. Because they broke their old sword while trying to kill Spider Demons. After receiving the new sword, *Inosuke* begins to break it again to give shape like his old one, which angers *Mr.Haganezuka* because he cannot bear that his creation is being destroyed. He raged at *Inosuke*. After *Tanjiro* tried for a long time finally, he calmed down. But for this crime, however, he punished *Inosuke* with a mathematical problem because he knew that *Inosuke* was very weak in mathematics.

Mr.Haganezuka gave him an array *A* with *N* integers and another array *B* with *M* integers. *Inosuke* has to do the following operation on these arrays-

1. **Multiply all the integers of the array A**, $resA = (A_1 \times A_2 \times A_3 \times \dots \times A_n)$
2. **Multiply all the integers of the array B**, $resB = (B_1 \times B_2 \times B_3 \times \dots \times B_m)$
3. **Then determine how many trailing zeros are there in $\frac{resA}{resB}$**

Mr.Haganezuka doesn't like fractional numbers. So he will **always give numbers of the array such a way that resA is always divisible by resB.**

Input

First line of input contains two integers *n* and *m*. ($1 \leq n+m \leq 10^5$)

Second line contains *n* integers $(A_1 \times A_2 \times A_3 \times \dots \times A_n)$. ($1 \leq A_i \leq 10^9$)

Third line contains *m* integers $(B_1 \times B_2 \times B_3 \times \dots \times B_m)$. ($1 \leq B_i \leq 10^9$)

Output

Number of trailing zero in the product of all integers of A divided by product of all integers in B.

Sample Input	Sample Output
1 2 1000 2 5	2

Notes: Be careful about the newline('\n') at the end.

Problem Category: Number Theory

Problem Setter: Shimul Shutrathar

Reviewer: Md. Shameem Alam

H. Road to MUZAN

Time Limit: 1s

Memory Limit: 512 MB

Description:

From the earliest times, humanity knows about human-eating monsters, lurking in the darkness to devour an unfortunate soul. The origin of those demons came from one name named '*Kibutsuji Muzan*' who is the king of the demons. Now to stop the monstrosity of the demons a secret organization named 'Demon Slayer Corps' started to look for skilled swordsmen who can kill the demons. Now a boy named *Tanjiro* joined the Demon Slayer Corps so that he can cure his sister who has been transformed into a demon due to *Muzan's* attack and to slay *Muzan* once and for all.

Now *Muzan* is a very tricky demon who can shapeshift (change his look and body shape) and nobody can find him easily. But one day *Tanjiro* and his friends find out a clue that when *Muzan* shapeshifts he also has to choose a name for his new form. The interesting part of the clue was that whenever he chooses a name, he chooses **the longest palindromic string that can be formed with the characters from the name**. The palindromic string is a sequence that reads the same backwards as forwards

Now, *Tanjiro* recognized you as the most talented programmer and a trustful friend. He has **given you an N length string and Q queries where i-th character will be changed permanently with C in each query. Now write a program that will give you the length of the longest palindrome string that can be formed after every query.**

Input

The first line of the input will contain an integer T which is the number of test cases. Then in every test case, in the first line there will be one integers N. The next line will contain a string of size N (without any space) only containing lowercase English letters. Then in the next line an integer Q will be given. Then each of the next Q lines will contain one integer i and one character C which is also a lowercase English letter.

Constraints:

$$1 \leq T \leq 30$$

$$1 \leq N, Q \leq 10^5$$

$$1 \leq i \leq n$$

Output

For every test case first print "Case X:" (without quotes) where X is the test case number. Then from the next line print the length of the longest palindromic string that can be formed with the characters from the current string after every query. Check out the samples for clarification.

Sample Input	Sample Output
2	Case 1:
8	8
abcacbac	7
3	5
1 c	Case 2:
1 a	4
2 d	3
4	
abaa	
2	
3 b	
1 c	

Notes: Be careful about the newline('\n') at the end.

Problem Category: String

Problem Setter: Riadh Hasan

Reviewer: Shah Habibul Imran

I. Here Is a Treat for You

Time Limit: 1s

Memory Limit: 512 MB

Description:

Kagaya Ubuyashiki, the 97-th leader of the Demon Slayer Corps, Also known as **Oyakata-sama** to the Demon Slayer Corps, just met **Tanjiro**, **Zenitsu**, and **Inosuke**. Instantly, he knew there is something special about them. But as special they are, they also need special training to make their ability grow faster as well. You know they can be trained best by the *hashiras* (*highest rank of demon slayers*) but the *hashiras* are busy slaying demons (Don't worry they respect the pandemic they are wearing masks, and saving people from demons is more important to them than quarantining right now). They are spread all around the world. They can't come to the demon slayer headquarters to teach them. So, the Oyakata-Sama made a scheme so that they can learn properly.

Initially, **Tanjiro**, **Zenitsu**, and **Inosuke** each knew only one breathing technique. Then all three meet at the demon slayer headquarters every time they get free to teach their breathing techniques to each other. After that, they go separate ways and practice those breathing techniques under different *hashiras*. **Tanjiro** practices the techniques shown by **Zenitsu** for x_1 days and after that, **Inosuke's** for y_1 days. But, as **Tanjiro** goes to train under the *hashiras*, they influence those techniques in a way that **the number of breathing techniques Tanjiro knows increases by the summation of $x_1 \times$ The number of techniques Zenitsu showed and $y_1 \times$ The number of techniques Inosuke showed.** In the same way, **Zenitsu's** and **Inosuke's** practices get influenced following the rule mentioned below-

Lets say, after i -th meeting and finishing practice the number of breathing techniques **Tanjiro**, **Zenitsu** and **Inosuke** know are T_i , Z_i and I_i respectively. So,

$$T_i = T_{i-1} + (Z_{i-1} \times x_1) + (I_{i-1} \times y_1)$$

$$Z_i = Z_{i-1} + (T_{i-1} \times x_2) + (I_{i-1} \times y_2)$$

$$I_i = I_{i-1} + (T_{i-1} \times x_3) + (Z_{i-1} \times y_3)$$



Today is such a day! They are going to meet again and **Oyakata-Sama** told me that they have met N times before today. So, I was wondering how many techniques **Tanjiro** know before the meeting (Why Tanjiro? I'll leave it to your imagination 😊). Anyway, the number of techniques **Tanjiro** know at this point might be so big that it might not fit into a 32-bit integer (this is **Demon Slayer** in some parallel universe anything is possible 😊) that is why you have to **output the value modulo** $10^9 + 7$ (1000000007). **In other words, Print** $T_n \% 1000000007$, initially $T_0 = 1, Z_0 = 1, I_0 = 1$.

Input

The first line will be a single integer T indicating the number of test cases. The following T lines will contain seven integers $x_1, y_1, x_2, y_2, x_3, y_3, N$ separated by spaces.

Constraints:

$$1 \leq T \leq 10^3$$

$$0 \leq x_1, y_1, x_2, y_2, x_3, y_3 \leq 10^9$$

$$1 \leq N \leq 10^9$$

Output

You have to output T lines in format "Case X : Y " (without quotes) where X is the number of test case and Y is $T_n \% 1000000007$.

Sample Input	Sample Output
3	Case 1: 10
1 2 0 0 0 3	Case 2: 81
1 1 1 1 1 4	Case 3: 1024
1 0 1 0 1 0 10	

For the 1st test case Initially, Tanjiro knows 1 technique, Zenitsu knows, 1 technique Inosuke knows 1 technique

After 1st meeting and finishing their practice,

Tanjiro knows $1+1\times 1+2\times 1=4$ techniques Zenitsu knows $1+0\times 1+0\times 1=1$ technique Inosuke knows $1+0\times 1+0\times 1=1$ technique

After 2nd meeting and finishing their practice,

Tanjiro knows $4+1\times 1+2\times 1=7$ techniques Zenitsu knows $1+0\times 1+0\times 1=1$ technique Inosuke knows $1+0\times 1+0\times 1=1$ technique

After 3rd meeting and finishing their practice, Tanjiro, Zenitsu and Inosuke know 10 techniques, 1 technique and 1 technique respectively.

Problem Category: Stopper

Problem Setter: Tanima Hossain

Reviewer: Mahmud Sajjad Abeer, Md. Erfanul Islam, Shah Habibul Imran

J. Behold! The Stopper!!!

Time Limit: 1s

Memory Limit: 512 MB

Description:

“I just want a dream, a happy peaceful dream. In it, I’m more powerful than anyone. I’m able to help the weak, anyone in trouble, anytime.” It’s Zenitsu Agatsuma, the demon slayer who can barely stand against any demon out of fear, cut the spider demon into two, even when he was under massive pain of spider poison. Yes, so fast that the demon couldn’t even realize from where and how it got cut. But Zenitsu thinks it was all a dream when he fell on his back.



“Everything that Gramps (master) taught me, all the time and effort he spent, it wasn't for nothing. In this dream, thanks to Gramps, I became strong and was able to help a lot of people. But the time for dreams, it's over now.”, talks to himself. None of this matters now, the poison is killing him. He feels like taking the last breath of his life.

He loses all hopes and is about to close his eyes forever. “**Never give up!**”, suddenly a voice came across his mind. It’s the voice of his Gramps, his sensei (master), the only person who didn’t give up on him. The voice gives him hope and It is the hope that keeps people alive. “**Don’t give up. I can use my breathing techniques to slow down the poison. Even if it’s painful, even if it’s agonizing, don’t try to take the easy way out or**

Gramps won't let you have it" he said to himself and continued his breathing techniques for some while.

"It's starting to get really hard to breathe now. I can't feel my arms and legs anymore.", he said to himself. **"Nezuko, I'm sorry."** Zenitsu gave his all and is still struggling to survive. The only thing that is not letting him die is the voice of his sensei. Then **Shinobu Kocho** arrived at the very moment, the **Insect Pillar** of the Demon Slayer Corps. She gave Zenitsu the antidote of the poison. It will take time to heal but he is out of danger now.

Sometimes a small inspiration can change your life. No matter how hard the situation is, you must remember what sensei said. Can you write a program to print **"Never Give Up!"** (without quotations)? Let me help you with the C program to print **"Programming is life"**.

```
#include <stdio.h>

int main() {
    printf("Programming is life\n");
    return 0;
}
```

Input

There is no input for this problem.

Output

Output the line mentioned in the statement to print.

Note: Please read the statement carefully.