UAP CSE100 Spring 2020 Takeoff Contest

https://toph.co/c/uap-cse100-spring-2020-takeoff-contest

Toph

Schedule

The contest will run for **2h0m0s**.

Authors

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Rules

This contest is formatted as per the official rules of ICPC Regional Programming Contests.

You can use C++17 GCC 9.2, C11 GCC 9.2, Java 1.8, and Python 3.7 in this contest.

Be fair, be honest. Plagiarism will result in disqualification. Judges' decisions will be final.

Notes

There are 5 challenges in this contest.

Please make sure this booklet contains all of the pages.

If you find any discrepencies between the printed copy and the problem statements in Toph Arena, please rely on the later.

A. All You Need Is ...

Once there lived an old couple in a suburb area. After retiring from their jobs they decided to travel. They packed their bags and started their journey towards Nijhumdwip, a small island on the very south. But it was the winter! So the rivers went dry. They couldn't continue their journey through the rivers. So, they started following the riverbanks. In the path, they were crossing many villages. They saw most people were spreading hatred, angry with each other, fighting over smallest arguments. They decided to do something different. Spreading Love! So they started helping poor people by giving clothes to fight cold. So, people can Love and enjoy the winter instead of hating this season. People started loving the old couple.

Many people were suffering from depression and feeling like a complete failure in their life. So, the couple started to listen to people's stories, and giving them the most powerful weapon to fight the hard times of life. Guess what it is? HOPE!

Everyone can find hope even in the darkest time of their life. They can Love everyone around them to increase their strength. Many people are filled with negative thoughts. So, they started to discuss the power of positivity with people.

You can't stay lost and accept defeat if you want a life where you are the winner. You can't think negative and hope to live a positive life. You must work hard for living your dream life. They received Love for their works.

You also possess the power to change the mindset of persons around you! You can let them feel that- they can spread Love instead of hatred. When we will start changing our mindset, the world will be a better place to live in.

Input

There is no input for this problem.

Output

You have to print the number of occurrences of the word "Love" in the problem description (including the title and excluding the input and output section). Then you have to print a new line. In this word there are four letters. The first letter 'L' must be in uppercase form, and the rest of three letters must be in lowercase form.

Here's a guideline on how to write this problem's solution in C Programming Language!

```
#include<stdio.h>
int main()
{
        int n = x;
        printf("%d\n",n);
        return 0;
}
```

In this code you just have to insert the number of occurrences of word “Love” in the problem description in the place of “x”. So all you have to do is count! Hurry up!! You are losing time!!!

B. One Two Three ...

Little Inaya is learning numbers! She loves to play number games with her father. She asks her father to tell her a number and then she tells the next one. If her father says **1**, she says **2**. Well, she can't actually ask her father using words, as she is just starting to speak. Rather she screams and pulls his shirt to let him know what she wants! But she only knows about single digit numbers, *i.e.* **0 to 9**. So when her father says **9**, she replies with **0**.

In this problem, you have to write a code which behaves like Inaya.

Input

You will be given an integer N (0 <= N <= 9).

Output

Print the number that will match Inaya's response in the game. Then print a new line.

Samples

Input	Output
1	2

C. Team for FPL!

Everyone is playing Fantasy Premier League now-a-days. It is a very famous online game. In order to play, you have to make a team of **5** players. Each of those players will have their own strength levels. And there is also a strength of the team, which is calculated by the **maximum difference in strength between any two players in the team**.

For example, let's say the strengths of your players are: **5, 1, 6, 8** and **3**. That means player#1's strength is **5**, player#2's strength is **1** and so on. To calculate the strength of the team, we can find the strength difference between every two players. Difference between player#1 and player#2 is **4**, difference between player#1 and player#3 is **1** and so on. If we calculate all the differences in this way, we will find these numbers: **4, 1, 3, 2, 5, 7, 2, 2, 3** and **8**. We can see among these numbers **7** is the maximum. So, your team's strength is **7**.

In this problem, you will be given the strength of the **5** players in your team. And you have to write a code to calculate the team's strength.

Input

There will be exactly 5 integers representing the strengths of the players. These strengths will be non-negative and not more than 100.

Output

Print a single integer which is the strength of the team. Then print a new line.

Samples

Input	Output
`5 1 6 8 3`	7

D. Binary Is Beautiful!

Binary Number System is one of the most beautiful creations in the history of the world! Don't you think?

We, as students Computer Science love to study binary numbers so much that we can do most of the calculations in our head. For example, converting from decimal to binary, checking odd-even etc. Given below is a similar problem related to binary numbers. Let's see if you can solve it!

You will be given a binary number **P**. You have to find the maximum value **Q** such that: $\mathbf{P \% 2^{Q} = 0}$. That means, if we divide **P** by $\mathbf{2^{Q}}$ then the remainder will be **0**.

Input

First line of input will contain an integer **N** (1 <= N <= 100) denoting the number of bits in the binary number P. The next line will contain the number **P** with **N** bits. You can assume the number will not have any leading zeroes.

Output

Print the value of **Q** according to the statement. Then print a new line.

Samples

Input	Output
3 111	0

Input	Output
3 100	2

E. Very Simple

Odd and even is the most common word in our programming life. If a number is divisible by 2, it is called even otherwise odd.

Let’s think different, if **Number Of Divisors (NOD)** of a number is odd, it will be called an odd number. Like, **10** has **4** divisors, they are **1 , 2 , 5** and **10**. So **NOD(10) = 4**, similarly **NOD(15) = 4**. You know **4** is not odd number so **10** and **15** are not odd.

Now you are given a number **N**. You have to determine the **N-th** number which has odd number of divisors.

Input

The first line of the input contains a single integer **T (1 ≤ T ≤ 100000)**, denoting the number of test cases. Each test case contains a number **N (1 ≤ N ≤ 100000000)**.

Output

For each test case print an integer that is the **N-th** number which has odd number of divisors. Then print a new line.

Samples

Input	Output
2 1 991	1 982081