Problem A. Double Rent

Time limit	1000 ms
Code length Limit	50000 B
OS	Linux

Chefina decided to move into Chef's apartment.
Chef was initially paying a rent of X rupees. Since Chefina is moving in, the owner decided to **double** the rent.

Find the final rent Chef needs to pay.

Input Format

The input consists of a single integer X, denoting the rent Chef was initially paying.

Output Format

Output on a new line, the final rent Chef needs to pay.

Constraints

- $1 \leq X \leq 10$

Sample 1

Input	Output
2	4

Chef was initially paying 2 rupees. After Chefina moves in, he needs to pay $2 \cdot 2 = 4$ rupees.

Sample 2

Input	Output
3	6

Chef was initially paying 3 rupees. After Chefina moves in, he needs to pay $2 \cdot 3 = 6$ rupees.

Sample 3

Input	Output
10	20

Chef was initially paying 10 rupees. After Chefina moves in, he needs to pay $2 \cdot 10 = 20$ rupees.

Problem B. Clear Day

Time limit	1000 ms
Code length Limit	50000 B
OS	Linux

Chef classifies a day to be either `rainy`, `cloudy`, or `clear`.

In a particular **week**, Chef finds X days to be `rainy` and Y days to be `cloudy`.
Find the number of `clear` days in the week.

Input Format

- The first and only line of input will contain two space-separated integers X and Y, denoting the number of rainy and cloudy days in the week.

Output Format

Output the number of clear days in the week.

Constraints

- $0 \leq X, Y \leq 7$
- $0 \leq X + Y \leq 7$

Sample 1

Input	Output
2 3	2

There are 7 days in a week. If there are 2 rainy days and 3 cloudy days, then the remaining $7 - 2 - 3 = 2$ days are clear.

Sample 2

Input	Output
3 4	0

If there are 3 rainy days and 4 cloudy days, then the remaining $7 - 3 - 4 = 0$ days are clear.

Problem C. Happy New Year 2025

Time limit 2000 ms
Mem limit 1048576 kB

Problem Statement

You are given two positive integers A and B.

Output the square of $A + B$.

Constraints

- $1 \leq A, B \leq 2025$
- All input values are integers.

Input

The input is given from Standard Input in the following format:

```
A B
```

Output

Print the answer.

Sample 1

Input	Output
20 25	2025

$(20 + 25)^2 = 2025$.

Sample 2

Input	Output
30 25	3025

Sample 3

Input	Output
45 11	3136

Sample 4

Input	Output
2025 1111	9834496

Problem D. Cricket World Cup Qualifier

Time limit	1000 ms
Code length Limit	50000 B
OS	Linux

The cricket World Cup has started in Chefland. There are many teams participating in the group stage matches. Any team that scores 12 or more points in the group stage matches qualifies for the next stage.

You know the score that a particular team has scored in the group stage matches. Determine if the team has qualified for the next stage or not.

Input Format

The first and only line of input consists of an integer X denoting the total points scored by the given team in the group stage matches.

Output Format

Output `Yes`, if the team has qualified for the next stage, and `No` otherwise.

You may print each character of the string in uppercase or lowercase (for example, the strings YES, yEs, yes, and yeS will all be treated as identical).

Constraints

- $1 \leq X \leq 20$

Sample 1

Input	Output
3	No

The team has not scored ≥ 12 points. Hence it does not qualify.

Sample 2

Input	Output
17	Yes

The team has scored $\geq$ 12 points. Hence it does qualify.

Some operators checks about the relationship between two values and these operators are called relational operators. Given two numerical values your job is just to find out the relationship between them that is (i) First one is greater than the second (ii) First one is less than the second or (iii) First and second one is equal.

Input

First line of the input file is an integer t ($t < 15$) which denotes how many sets of inputs are there. Each of the next t lines contain two integers a and b ($|a|, |b| < 1000000001$).

Output

For each line of input produce one line of output. This line contains any one of the relational operators '>', '<' or '=', which indicates the relation that is appropriate for the given two numbers.

Sample Input

```
3
10 20
20 10
10 10
```

Sample Output

```
<
>
=
```

Problem F. Exact Price

Time limit 2000 ms
Mem limit 1048576 kB

Problem Statement

Takahashi's purse has one or more 100-yen coins in it and nothing else. (Yen is the Japanese currency.)

Is it possible that the total amount of money in the purse is X yen?

Constraints

- $0 \leq X \leq 1000$
- All values in input are integers.

Input

Input is given from Standard Input in the following format:

```
X
```

Output

If it is possible that the total amount of money in Takahashi's purse is X yen, print `Yes`; otherwise, print `No`.

Sample 1

Input	Output
500	Yes

If the purse has five 100-yen coins, the total amount of money is 500 yen. Thus, it is possible that the total amount is $X = 500$ yen, so we should print `Yes`.

Sample 2

Input	Output
40	No

Sample 3

Input	Output
0	No

Note that the purse has at least one 100-yen coin.

Problem G. Sum

Time limit 1000 ms
Mem limit 262144 kB

You are given three integers a, b, and c. Determine if one of them is the sum of the other two.

Input

The first line contains a single integer t ($1 \le t \le 9261$) — the number of test cases.

The description of each test case consists of three integers a, b, c ($0 \le a, b, c \le 20$).

Output

For each test case, output "`YES`" if one of the numbers is the sum of the other two, and "`NO`" otherwise.

You can output the answer in any case (for example, the strings "`yEs`", "`yes`", "`Yes`" and "`YES`" will be recognized as a positive answer).

Examples

Input	Output
7 1 4 3 2 5 8 9 11 20 0 0 0 20 20 20 4 12 3 15 7 8	YES NO YES YES NO NO YES

Note

In the first test case, $1 + 3 = 4$.

In the second test case, none of the numbers is the sum of the other two.

In the third test case, $9 + 11 = 20$.

Problem H. Weird Algorithm

Time limit 1000 ms
Mem limit 524288 kB

Consider an algorithm that takes as input a positive integer n. If n is even, the algorithm divides it by two, and if n is odd, the algorithm multiplies it by three and adds one. The algorithm repeats this, until n is one. For example, the sequence for $n = 3$ is as follows:

$$3 \to 10 \to 5 \to 16 \to 8 \to 4 \to 2 \to 1$$

Your task is to simulate the execution of the algorithm for a given value of n.

Input

The only input line contains an integer n.

Output

Print a line that contains all values of n during the algorithm.

Constraints

- $1 \leq n \leq 10^6$

Example

Input	Output
3	3 10 5 16 8 4 2 1

Problem I. Repetitions

Time limit 1000 ms
Mem limit 524288 kB

You are given a DNA sequence: a string consisting of characters A, C, G, and T. Your task is to find the longest repetition in the sequence. This is a maximum-length substring containing only one type of character.

Input

The only input line contains a string of n characters.

Output

Print one integer: the length of the longest repetition.

Constraints

- $1 \leq n \leq 10^6$

Example

Input	Output
ATTCGGGA	3

Problem J. Choosing Teams

Time limit	1000 ms
Mem limit	262144 kB
Input file	stdin
Output file	stdout

The Saratov State University Olympiad Programmers Training Center (SSU OPTC) has n students. For each student you know the number of times he/she has participated in the ACM ICPC world programming championship. According to the ACM ICPC rules, each person can participate in the world championship at most 5 times.

The head of the SSU OPTC is recently gathering teams to participate in the world championship. Each team must consist of exactly three people, at that, any person cannot be a member of two or more teams. What maximum number of teams can the head make if he wants each team to participate in the world championship with the same members at least k times?

Input

The first line contains two integers, n and k ($1 \le n \le 2000$; $1 \le k \le 5$). The next line contains n integers: $y_1, y_2, ..., y_n$ ($0 \le y_i \le 5$), where y_i shows the number of times the i-th person participated in the ACM ICPC world championship.

Output

Print a single number — the answer to the problem.

Examples

Input	Output
5 2 0 4 5 1 0	1

Input	Output
6 4 0 1 2 3 4 5	0

Input	Output
6 5 0 0 0 0 0 0	2

Note

In the first sample only one team could be made: the first, the fourth and the fifth participants.

In the second sample no teams could be created.

In the third sample two teams could be created. Any partition into two teams fits.