1. Leap year (15%)

Write a program to enter the year and determine whether it is a leap year.
(A year that is divisible by 4 and not divisible by 100 with the exception that years that are divisible by 400 are also leap year.)

Input

One integer n.

Output

The input is a leap year, output “This is a leap year.”, if it is not, output “This is not a leap year.”.

Sample Input 1

2000

Sample Output 1

This is a leap year.

Sample Input 2

2013

Sample Output 2

This is not a leap year.

2. Row sum and column sum (15%)

Write a program that reads an integer n, the value of n is between 5~10, and inputs an integer array of n x n, and then outputs the row sum and column sum:
If you make a mistake, display Error.

Input

One integer n and n x n integers m.

Output

The row sum and column sum.
If the input have mistake, display Error.

Sample Input 1

"
5
8 3 9 0 10
3 5 17 1 1
2 8 6 23 1
15 7 3 2 9
6 14 2 6 0
"

Sample Output 1

"
Row totals: 30 27 40 36 28
Column totals: 34 37 37 32 21
"

Sample Input 2

"
4
1 2 3 4
1 2 3 4
1 2 3 4
1 2 3 4
"

Sample Output 2

"Error
"

3. Rabbit (15%)

A classic math theorem in the book Liber Abaci (1202) is that:

Suppose a newly-born pair of rabbits, one male, one female, are put in a field. Rabbits are able to mate at the age of one month so that at the end of its second month a female can produce another pair of rabbits. Suppose that our rabbits never die and that the female always produces one new pair (one male, one female) every month from the second month on.

At the end of the first month, they mate, but there is still one only 1 pair.

At the end of the second month the female produces a new pair, so now there are 2 pairs of rabbits in the field.

At the end of the third month, the original female produces a second pair, making 3 pairs in all in the field.

At the end of the fourth month, the original female has produced yet another new pair, the female born two months ago produces her first pair also, making 5 pairs.

Now, you need to solve this problem. The input only has a positive number N, which N < 30, and your program need to output at the end of Nth month, there are how many pairs rabbits in the field?

Input

The input is positive integer N. N < 30.

Output

For each input, your program need to output at the end of Nth month, there are how many pairs rabbits in the field.

For example: There are **1** pair rabbits in 1st month end, **2** pairs rabbits in 2nd month end, **3** pairs rabbits in 3rd month end, **5** pairs rabbits in 4th month end.

Sample Input 1 1, 2, 3, 5, 8, 13,

6

Sample Output 1

8

Sample Input 2

7

Sample Output 2

13

4. Perfect number (25%)

Perfect number is a positive integer that is equal to the sum of its positive divisors, excluding the number itself.
Amicable numbers are two different numbers related in such a way that the sum of the proper divisors of each is equal to the other number.

Write a program to determine if the given positive integer, N, is a perfect number. Given a positive integer N, 1 < N < 10^9. If N is not a perfect number, the program should further determine if N has an amicable number Y.

For example, 28 is a perfect number. The positive divisors of 28 are 1, 2, 4, 7, 14, and 28. Excluding 28, the sum of 1, 2, 4, 7, 14 is 1+2+4+7+14=28, which is equal to 28 itself.

220 and 284 are amicable numbers. It means that the sum of the divisors of 220 excluding itself is 284, and that of 284 is 220:
The sum of the divisors of 220 = 1+2+4+5+10+11+20+22+44+55+110=284
The sum of the divisors of 284 = 1+2+4+71+142=220

Input
One integer n.

Output
The output of the program should follow the rules:
(1)If N is a perfect number, the program should output: N is a perfect number.
(2) If N has an amicable number, the program should output: N's amicable number is Y. (3)If N is neither a perfect number nor having an amicable number, the program should output: N is not a perfect number and does not have amicable number.

Sample Input
28

Sample Output
28 is a perfect number.

Sample Input
220

Sample Output

220’s amicable number is 284.

Sample Input

5

Sample Output

5 is not a perfect number and does not have amicable number.

5. Build the pyramid (30%)

Write a program that draws a pyramid with different height (number of rows).
The range of the height is 0 <= height <= 100.

Input

One integer n, 0 <= n <= 100.

Output

Use the sign " * " and " " write a triangle with different height.
If height = 0, you have to output "The triangle is empty.".

Sample Input

1

Sample Output

```
*
```

Sample Input

2

Sample Output

```
  *
***
```

Sample Input

4

Sample Output

```
     *
   ***
  *****
*******
```

Sample Input

0

Sample Output

The pyramid is empty.

6. ***GCD&LCM***

(40%)

The GCD of two positive integers is the largest integer that divides both the integers without any remainder. The LCM of two positive integers is the smallest positive integer that is divisible by both the integers. A positive integer can be the GCD of many pairs of numbers. Similarly, it can be the LCM of many pairs of numbers. In this problem, you will be given two positive integers. You have to output a pair of numbers whose GCD is the first number and LCM is the second number.

*The calculation method of LCM: n * m / GCD(n , m)

Input

The input will contain two positive integer, G and L.

Both G and L will be less than 2^31.

Output

For each case of input, there will be one line of output. It will contain two positive integers a and b, a ≤ b, which has a GCD of G and LCM of L. In case there is more than one pair satisfying the condition, output the pair for which a is **minimized.** In case there is no such pair, output '-1'.

Sample Input

1 2

Sample Output

1 2

Sample Input

3 4

Sample Output

-1