

## Sheet #1 (Data type - Conditions)

## A. Say Hello With C++

1 second, 256 megabytes

Given a name  $S$ . Print "Hello, (name)" without parentheses.

## Input

Only one line containing a string  $S$ .

## Output

Print "Hello, " without quotes, then print name.

input
programmer
output
Hello, programmer

## B. Basic Data Types

1 second, 256 megabytes

The following lines show some C++ data types, their format specifiers and their most common bit widths:

- **int** : 32 Bit integer.
- **long long** : 64 bit integer
- **Char** : 8 bit Characters & symbols
- **Float** : 32 bit real value
- **Double** : 64 bit real value

## Reading

To read a data type, use the following syntax:

```
cin >> VariableName;
```

For example, to read a character followed by a double:

```
char ch;
double d;
cin >> ch >> d;
```

## Printing

To print a data type, use the following syntax:

```
cout << VariableName;
```

For example, to print a character followed by a double:

```
char ch = 'd';
double d = 234.432;
cout << ch << " " << d;
```

## Input

Only one line containing the following space-separated values: **int**, **long long**, **char**, **float** and **double** respectively.

## Output

Print each element on a **new line** in the same order it was received as input.

**Don't print any extra spaces.**

input
3 12345678912345 a 334.23 14049.30493
output
3 12345678912345 a 334.23 14049.3

## C. Simple Calculator

1 second, 256 megabytes

Given two numbers  $X$  and  $Y$ . Print the **summation** and **multiplication** and **subtraction** of these 2 numbers.

## Input

Only one line containing two separated numbers  $X, Y$  ( $1 \leq X, Y \leq 10^5$ ).

## Output

Print 3 lines that contain the following in the same order:

1. " $X + Y$  = **summation** result" without quotes.
2. " $X * Y$  = **multiplication** result" without quotes.
3. " $X - Y$  = **subtraction** result" without quotes.

input
5 10
output
5 + 10 = 15 5 * 10 = 50 5 - 10 = -5

**Be careful with spaces.**

## D. Difference

1 second, 256 megabytes

Given four numbers  $A, B, C$  and  $D$ . Print the result of the following equation :

$$X = (A * B) - (C * D).$$

## Input

Only one line containing 4 separated numbers  $A, B, C$  and  $D$  ( $-10^5 \leq A, B, C, D \leq 10^5$ ).

## Output

Print "Difference = " without quotes followed by the equation result.

input
1 2 3 4
output
Difference = -10

input
2 3 4 5
output
Difference = -14

input
4 5 2 3
output
Difference = 14

E. Area of a Circle

1 second🕒, 256 megabytes

Given a number  $R$  calculate the **area** of a circle using the following formula:

$Area = \pi * R^2$ .

**Note:** consider  $\pi = 3.141592653$ .

Input

Only one line containing the number  $R$  ( $1 \leq R \leq 100$ ).

Output

Print the calculated **area**, with **9** digits after the decimal point.

input
2.00
output
12.566370612

\* Use the data type double for this problem.  
\*\* Use setprecision(9) to print 9 digits after decimal point.  
\*\*\* you can use function **setprecision** that are in **#include<iomanip>** library for Example :

```
#include<iostream>
#include<iomanip>
using namespace std;
int main()
{
    cout << fixed << setprecision(9);
    // your code.
}
```

F. Digits Summation

0.25 seconds🕒, 64 megabytes

Given two numbers  $N$  and  $M$ . Print the **summation** of their **last digits**.

Input

Only one line containing two numbers  $N, M$  ( $0 \leq N, M \leq 10^{18}$ ).

Output

Print the answer of the problem.

input
13 12

output
5

First Example :

**last digit** in the first number is **3** and **last digit** in the second number is **2**.  
So the answer is: **(3 + 2 = 5)**

G. Summation from 1 to N

0.25 seconds🕒, 256 megabytes

Given a number  $N$ . Print the **summation** of the numbers that is between **1** and  $N$  (**inclusive**).

$$\sum_{i=1}^N i$$

Input

Only one line containing a number  $N$  ( $1 \leq N \leq 10^9$ )

Output

Print the **summation** of the numbers that are between **1** and  $N$  (**inclusive**).

input
3
output
6

input
10
output
55

First Example :

the numbers between 1 and 3 are **1,2,3** .

So the answer is: **(1 + 2 + 3 = 6)**

Second Example :

the numbers between 1 and 10 are **1,2,3,4,5,6,7,8,9,10**.

So the answer is: **(1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 + 10 = 55)**

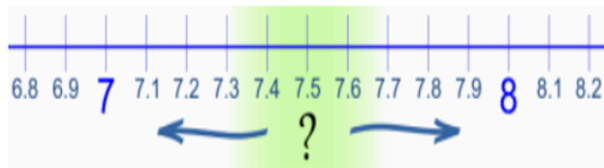
H. Two numbers

1 second🕒, 256 megabytes

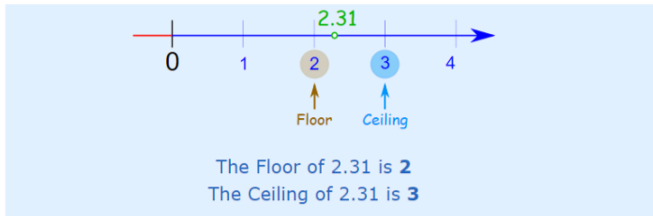
Given **2** numbers  $A$  and  $B$ . Print **floor**, **ceil** and **round** of  $A/B$

Note:

- **Floor:** Is a mathematical function that takes a real number  $X$  and its output is the **greatest** integer **less than or equal to**  $X$ .
- **Ceil:** Is a mathematical function that takes a real number  $X$  and its output is the **smallest** integer **larger than or equal to**  $X$ .
- **Round:** Is a mathematical function that takes a real number  $X$  and its output is the **closest** integer to that number  $X$ .



The round of 7.3 is 7  
 The round of 7.5 is 8  
 The round of 7.7 is 8



The Floor of 2.31 is 2  
 The Ceiling of 2.31 is 3

For more clarification visit the links in the notes below.

### Input

Only one line containing two numbers  $A$  and  $B$  ( $1 \leq A, B \leq 10^3$ )

### Output

Print 3 lines that contain the following in the same order:

1. "floor  $A / B = \text{Floor result}$ " without quotes.
2. "ceil  $A / B = \text{Ceil result}$ " without quotes.
3. "round  $A / B = \text{Round result}$ " without quotes.

<b>input</b>
10 3
<b>output</b>
floor 10 / 3 = 3 ceil 10 / 3 = 4 round 10 / 3 = 3

<b>input</b>
10 4
<b>output</b>
floor 10 / 4 = 2 ceil 10 / 4 = 3 round 10 / 4 = 3

<b>input</b>
10 6
<b>output</b>
floor 10 / 6 = 1 ceil 10 / 6 = 2 round 10 / 6 = 2

Links:

- For Rounding method visit:  
<https://www.mathsisfun.com/numbers/rounding-methods.html>.
- For Flooring and Ceiling method visit:  
<https://www.mathsisfun.com/sets/function-floor-ceiling.html>.

## I. Welcome for you with Conditions

1 second🕒, 64 megabytes

Problems - Codeforces

Given two numbers  $A$  and  $B$ . Print "Yes" if  $A$  is greater than or equal to  $B$ . Otherwise print "No".

### Input

Only one line containing two numbers  $A$  and  $B$  ( $0 \leq A, B \leq 100$ ).

### Output

Print "Yes" or "No" according to the statement.

<b>input</b>
10 9
<b>output</b>
Yes

<b>input</b>
5 5
<b>output</b>
Yes

<b>input</b>
5 7
<b>output</b>
No

## J. Multiples

1 second🕒, 256 megabytes

Given two numbers  $A$  and  $B$ . Print "Multiples" if  $A$  is multiple of  $B$  or vice versa. Otherwise print "No Multiples".

### Input

Only one line containing two numbers  $A, B$  ( $1 \leq A, B \leq 10^6$ )

### Output

Print the "Multiples" or "No Multiples" corresponding to the read numbers.

<b>input</b>
9 3
<b>output</b>
Multiples

<b>input</b>
6 24
<b>output</b>
Multiples

<b>input</b>
12 5
<b>output</b>
No Multiples

\*\*\* $A$  is said to be Multiple of  $B$  if  $B$  is divisible by  $A$ .

**First Example :**

9 is divisible by 3 , So the answer is: Multiples.

**Second Example :**

6 is not divisible by 24 but

**24** is divisible by **6** , So the answer is: Multiples.

**Third Example :**

**12** is not divisible by **5** and **5** is not divisible by **12**.

So the answer is: No Multiples.

## K. Max and Min

0.25 seconds🕒, 64 megabytes

Given 3 numbers  $A$ ,  $B$  and  $C$ , Print the **minimum** and the **maximum** numbers.

### Input

Only one line containing 3 numbers  $A$ ,  $B$  and  $C$  ( $-10^5 \leq A, B, C \leq 10^5$ )

### Output

Print the **minimum** number followed by a single space then print the **maximum** number.

input
1 2 3
output
1 3

input
-1 -2 -3
output
-3 -1

input
10 20 -5
output
-5 20

## L. The Brothers

1 second🕒, 256 megabytes

Given two person names.

Each person has {"the first name" + "the second name"}

Determine whether they are brothers or not.

**Note:** The two persons are brothers if they **share the same second name**.

### Input

First line will contain two Strings  $F_1$ ,  $S_1$  which donates the first and second name of the 1<sup>st</sup> person.

Second line will contain two Strings  $F_2$ ,  $S_2$  which donates the first and second name of the 2<sup>nd</sup> person.

### Output

Print **"ARE Brothers"** if they are brothers otherwise print **"NOT"**.

input
bassam ramadan ahmed ramadan
output
ARE Brothers

## Problems - Codeforces

input
ali salah ayman salah
output
ARE Brothers

input
ali kamel ali salah
output
NOT

## M. Capital or Small or Digit

1 second🕒, 256 megabytes

Given a letter  $X$ . Determine whether  $X$  is Digit or Alphabet and if it is Alphabet determine if it is **Capital Case** or **Small Case**.

### Note:

- Digits in ASCII '0' = 48, '1' = 49 ....etc
- Capital letters in ASCII 'A' = 65, 'B' = 66 ....etc
- Small letters in ASCII 'a' = 97, 'b' = 98 ....etc

### Input

Only one line containing a character  $X$  which will be a capital or small letter or digit.

### Output

Print a single line contains **"IS DIGIT"** if  $X$  is **digit** otherwise, print **"ALPHA"** in the first line followed by a new line that contains **"IS CAPITAL"** if  $X$  is a **capital** letter and **"IS SMALL"** if  $X$  is a **small letter**.

input
A
output
ALPHA IS CAPITAL

input
9
output
IS DIGIT

input
a
output
ALPHA IS SMALL

\*\* recommended to read this to know more about ASCII Code  
<https://www.javatpoint.com/ascii>.

## N. Char

0.25 seconds🕒, 64 megabytes

Given a letter  $X$ . If the letter is **lowercase** print the letter after converting it from **lowercase letter to uppercase letter**. Otherwise print the letter after converting it from **uppercase letter to lowercase letter**

Note : **difference between 'a' and 'A' in ASCII is 32 .**

**Input**

Only one line containing a character X which will be a **capital** or **small** letter.

**Output**

Print the answer to this problem.

<b>input</b>
a
<b>output</b>
A

<b>input</b>
A
<b>output</b>
a

O. Calculator

1 second🕒, 256 megabytes

Given a mathematical expression. The expression will be one of the following expressions:  $A + B$ ,  $A - B$ ,  $A * B$  and  $A/B$ .

Print the **result** of the mathematical expression.

**Input**

Only one line contains  $A$ ,  $S$  and  $B$  ( $1 \leq A, B \leq 10^4$ ),  $S$  is either (+, -, \*, /).

**Output**

Print the **result** of the mathematical expression.

<b>input</b>
7+54
<b>output</b>
61

<b>input</b>
17*10
<b>output</b>
170

For the dividing operation you should print the division without any fractions.

P. First digit !

0.25 seconds🕒, 64 megabytes

Given a number  $X$ . Print "EVEN" if the first digit of X is **even number**. Otherwise print "ODD".

**For example:** In **4569** the first digit is **4**, the second digit is **5**, the third digit is **6** and the fourth digit is **9**.

**Input**

Only one line containing a number  $X$  ( $999 < X \leq 9999$ )

**Output**

If the first digit is even print "**EVEN**" otherwise print "**ODD**".

<b>input</b>
4569
<b>output</b>
EVEN

<b>input</b>
3569
<b>output</b>
ODD

**Second Example :**

In **3569** the first digit is **3** and its ODD.

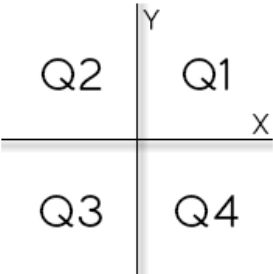
Q. Coordinates of a Point

1 second🕒, 256 megabytes

Given two numbers  $X$ ,  $Y$  which donate coordinates of a point in 2D plan. Determine in which quarter does it belong.

**Note:**

- Print **Q1**, **Q2**, **Q3**, **Q4** according to the quarter in which the point belongs to.
- Print "**Origem**" If the point is at the origin.
- Print "**Eixo X**" If the point is over X axis.
- Print "**Eixo Y**" if the point is over Y axis.



**Input**

Only one line containing two numbers  $X$ ,  $Y$  ( $-1000 \leq X, Y \leq 1000$ ).

**Output**

Print the answer to problem above.

<b>input</b>
4.5 -2.2
<b>output</b>
Q4

<b>input</b>
0.1 0.1
<b>output</b>
Q1

R. Age in Days

1 second🕒, 256 megabytes

Given a Number  $N$  corresponding to a person's age (in days). Print his age in years, months and days, followed by its respective message "years", "months", "days".

**Note:** consider the whole year has **365** days and **30** days per month.

**Input**

Only one line containing a number  $N$  ( $0 \leq N \leq 10^6$ ).

**Output**

Print the output, like the following examples.

<b>input</b>
400
<b>output</b>
1 years 1 months 5 days

<b>input</b>
800
<b>output</b>
2 years 2 months 10 days

<b>input</b>
30
<b>output</b>
0 years 1 months 0 days

**S. Interval**

1 second🕒, 256 megabytes

Given a number  $X$ . Determine in which of the following intervals the number  $X$  belongs to:

[0,25], (25,50], (50,75], (75,100]

**Note:**

- if  $X$  belongs to any of the above intervals print "Interval " followed by the interval.
- if  $X$  **does not belong** to any of the above intervals print "**Out of Intervals**".
- The symbol ' $'$ ' represents greater than.
- The symbol ' $'$ ' represents smaller than.
- The symbol ' $'$ ' represents greater than or equal.
- The symbol ' $'$ ' represents smaller than or equal.

For example:

[0,25] indicates numbers between **0** and **25.0000**, including both.

(25,50] indicates numbers greater than **25: (25.00001)** up to **50.0000000**.

**Input**

Only one line containing a number  $X$  ( $-1000 \leq X \leq 1000$ ).

**Output**

Print the answer to the problem above.

<b>input</b>
25.1
<b>output</b>
Interval (25,50]

Problems - Codeforces

<b>input</b>
25.0
<b>output</b>
Interval [0,25]

<b>input</b>
100.0
<b>output</b>
Interval (75,100]

<b>input</b>
-25.2
<b>output</b>
Out of Intervals

**T. Sort Numbers**

0.25 seconds🕒, 256 megabytes

Given three numbers  $A, B, C$ . Print these numbers in ascending order followed by a blank line and then the values in the sequence as they were read.

**Input**

Only one line containing three numbers  $A, B, C$  ( $-10^6 \leq A, B, C \leq 10^6$ )

**Output**

Print the values in ascending order followed by a blank line and then the values in the sequence as they were read.

<b>input</b>
3 -2 1
<b>output</b>
-2 1 3  3 -2 1

<b>input</b>
-2 10 0
<b>output</b>
-2 0 10  -2 10 0

**U. Float or int**

1 second🕒, 256 megabytes

Given a number  $N$ . Determine whether  $N$  is **float number** or **integer number**.

**Note:**

- If  $N$  is **float number** then print "**float**" followed by the **integer** part followed by **decimal** part separated by space.
- If  $N$  is **integer number** then print "**int**" followed by the **integer** part separated by space.

For more clarification see the examples below.

Input

Only one line containing a number  $N$  ( $1 \leq N \leq 10^3$ )

Output

Print the answer required above.

input
234.000
output
int 234

input
534.958
output
float 534 0.958

V. Comparison

1 second🕒, 256 megabytes

Given a comparison symbol  $S$  between two numbers  $A$  and  $B$ . Determine whether it is **Right** or **Wrong**.

The comparison is as follows:  $A < B, A > B, A = B$ .

Where  $A, B$  are two integer numbers and  $S$  refers to the sign between them.

Input

Only one line containing  $A, S$  and  $B$  respectively ( $-100 \leq A, B \leq 100$ ),  $S$  can be ('<', '>', '=') without the quotes.

Output

Print "Right" if the comparison is true, "Wrong" otherwise.

input
5 > 4
output
Right

input
9 < 1
output
Wrong

input
4 = 4
output
Right

W. Mathematical Expression

0.25 seconds🕒, 256 MB

Problems - Codeforces

Given a mathematical expression. The expression will be one of the following expressions:

$A + B = C, A - B = C$  and  $A * B = C$

where  $A, B, C$  are three numbers,  $S$  is the sign between  $A$  and  $B$ , and  $Q$  the '=' sign

Print "Yes" If the expression is **Right** , Otherwise print **the right answer of the expression**.

Input

Only one line containing the expression:  $A, S, B, Q, C$  respectively ( $0 \leq A, B \leq 100, -10^5 \leq C \leq 10^5$ ) and  $S$  can be ('+', '-', '\*') without the quotation.

Output

Output either "Yes" (without the quotation) or the right answer depending on the statement.

input
5 + 10 = 15
output
Yes

input
3 - 1 = 2
output
Yes

input
2 * 10 = 19
output
20

X. Two intervals

1 second🕒, 256 megabytes

Given the boundaries of **2** intervals. Print the boundaries of their **intersection**.

**Note:** **Boundaries** mean the two ends of an interval which are the starting number and the ending number.

Input

Only one line contains two intervals  $[l_1, r_1], [l_2, r_2]$  where ( $1 \leq l_1, l_2, r_1, r_2 \leq 10^9$ ), ( $l_1 \leq r_1, l_2 \leq r_2$ ).

It's guaranteed that  $l_1 \leq r_1$  and  $l_2 \leq r_2$ .

Output

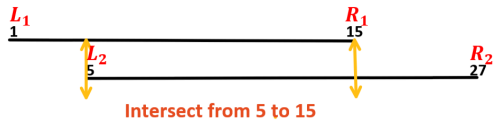
If there is an **intersection** between these **2** intervals print its boundaries , otherwise print **-1**.

input
1 15 5 27
output
5 15

input
2 5 6 12

output
-1

First Example :



Second Example :



Y. The last 2 digits

1 second🕒, 256 megabytes

Given 4 numbers  $A, B, C$  and  $D$ . Print the **last 2 digits** from their **Multiplication**.

**Input**  
Only one line containing four numbers  $A, B, C$  and  $D$   
( $2 \leq A, B, C, D \leq 10^9$ ).

**Output**  
Print the **last 2 digits** from their **Multiplication**.

input
5 7 2 4
output
80

input
3 9 9 9
output
87

First Example :

the Multiplication of 4 numbers is  $5 * 7 * 2 * 4 = 280$  so the answer will be the last 2 digits which are **80**.

Second Example :

the Multiplication of 4 numbers is  $3 * 9 * 9 * 9 = 2187$  so the answer will be the last 2 digits which are **87**.

Z. Hard Compare

1 second🕒, 256 megabytes

Given 4 numbers  $A, B, C$  and  $D$ . If  $A^B > C^D$  print "**YES**" otherwise, print "**NO**".

**Input**  
Only one line containing 4 numbers  $A, B, C$  and  $D$  ( $1 \leq A, C \leq 10^7$ ), ( $1 \leq B, D \leq 10^{12}$ )

**Output**  
Print "**YES**" or "**NO**" according to the problem above.

input
3 2 5 4
output
NO

input
5 2 4 2
output
YES

input
5 2 5 2
output
NO

First Example :

$3^2 = 9$  and  $5^4 = 625$  then  $9 < 625$  so the answer is **NO**.

Second Example :

$5^2 = 25$  and  $4^2 = 16$  then  $25 > 16$  so the answer is **YES**.

Third Example :

$5^2 = 25$  and  $5^2 = 25$  then  $25 = 25$  so the answer is **NO**.