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 π = **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

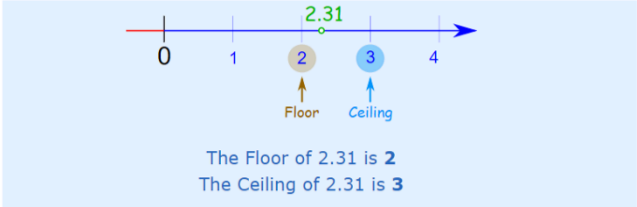
1 second, 256 megabytes

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 = **Floor result**" without quotes.
2. "ceil A / B = **Ceil result**" without quotes.
3. "round A / B = **Round result**" without quotes.

input
10 3
output
floor 10 / 3 = 3 ceil 10 / 3 = 4 round 10 / 3 = 3

input
10 4
output
floor 10 / 4 = 2 ceil 10 / 4 = 3 round 10 / 4 = 3

input
10 6
output
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

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.

input
10 9
output
Yes

input
5 5
output
Yes

input
5 7
output
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.

input
9 3
output
Multiples

input
6 24
output
Multiples

input
12 5
output
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^{st} person.

Second line will contain two Strings F_2, S_2 which donates the first and second name of the 2^{nd} person.

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

input
bassam ramadan ahmed ramadan
output
ARE Brothers

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.

input
a
output
A

input
A
output
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 $(1 \le A, B \le 10^4)$, S is either $(+, -, *, /)$.

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

input
7+54
output
61

input
17*10

output
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".

input
4569
output
EVEN

input
3569
output
ODD

Second Example :

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

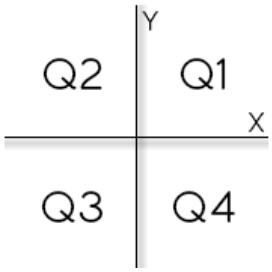
Q. Coordinates of a Point

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.

input
4.5 -2.2
output
Q4

input
0.1 0.1
output
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.

input
400
output
1 years 1 months 5 days

input
800
output
2 years 2 months 10 days

input
30
output
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.

input
25.1
output
Interval (25,50]

input
25.0
output
Interval [0,25]

input
100.0
output
Interval (75,100]

input
-25.2
output
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 ($-10^6 \le A, B, C \le 10^6$)

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

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

input
-2 10 0
output
-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 ($1 \le N \le 10^3$)

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 ($-100 \le A, B \le 100$), 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

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 $(0 \le A, B \le 100,\ -10^5 \le C \le 10^5)$ 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 $(1 \le l_1, l_2, r_1, r_2 \le 10^9)$, $(l_1 \le r_1, l_2 \le r_2)$.

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

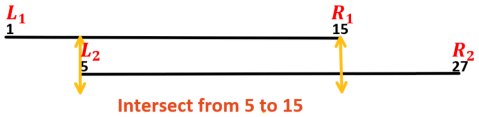
Output

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

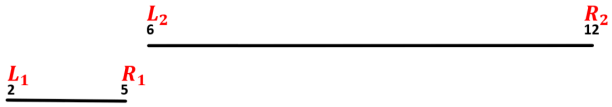
input
1 15 5 27
output
5 15

input
2 5 6 12
output
-1

First Example :



Second Example :



There are No intersections

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 $(2 \le A, B, C, D \le 10^9)$.

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 $(1 \le A, C \le 10^7)$, $(1 \le B, D \le 10^{12})$

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**.
