

# Codeforces Problems

A decorative graphic consisting of several horizontal bars of varying lengths and shades of red and white, extending from the left edge of the slide towards the right, positioned below the title.

time limit per test: 2 seconds  
memory limit per test: 64 megabytes  
input: standard input  
output: standard output

Some operators check 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

Each test case contains two integers  $a$  and  $b$  ( $|a|, |b| < 1000000000$ ).

### 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 test(s)

**input**

10 20

**output**

<

**input**

20 10

**output**

>

**input**

10 10

**output**

=

(Global Scope)

```
#include<iostream>
using namespace std;
int main ()
{
    double number1 , number2;
    cin>>number1>>number2;
    if(number1>number2)
        cout<<">"<<endl;
    else if (number1<number2)
        cout<<"<"<<endl;
    else
    {
        cout<<"="<<endl;
    }
    return 0;
}
```

input: standard input

output: standard output

Company XYZ have been badly hit by recession and is taking a lot of cost cutting measures. Some of these measures include giving up office space, going open source, reducing incentives, cutting on luxuries and issuing pink slips. They have got three (3) employees working in the accounts department and are going to lay-off two (2) of them. After a series of meetings, they have decided to dislodge the person who gets the most salary and the one who gets the least. This is usually the general trend during crisis like this. You will be given the salaries of these 3 employees working in the accounts department. You have to find out the salary of the person who survives.

### Input

Each case consists of a line with 3 distinct positive integers. These 3 integers represent the salaries of the three employees. All these integers will be in the range [1000, 10000].

### Output

For each case, output the salary of the person who survives.

### Sample test(s)

**input**

1000 2000 3000

**output**

2000

**input**

3000 2500 1500

**output**

2500

**input**

1500 1200 1800

**output**

1500

```
#include<iostream>
using namespace std;
int main ()
{
    double salary1 , salary2 ,salary3;

    cin>>salary1>>salary2>>salary3;

    if((salary1>salary2 && salary1<salary3)|| (salary1<salary2 && salary1>salary3))
        cout<<salary1<<endl;
    else if ((salary2>salary1 && salary2<salary3)|| (salary2>salary3 && salary2<salary1))
    {
        cout<<salary2<<endl;
    }
    else
        cout<<salary3<<endl;
    return 0;
}
```

memory limit per test: 64 megabytes

input: standard input

output: standard output

A long time ago, the Egyptians figured out that a triangle with sides of length 3, 4, and 5 had a right angle as its largest angle. You must determine if other triangles have a similar property.

### Input

Input represents several test cases, followed by a line containing 0 0 0. Each test case has three positive integers, less than 30,000, denoting the lengths of the sides of a triangle.

### Output

For each test case, a line containing "right" if the triangle is a right triangle, and a line containing "wrong" if the triangle is not a right triangle.

### Sample test(s)

**input**

6 8 10

**output**

right

**input**

25 52 60

**output**

wrong

**input**

5 12 13

**output**

right

```
#include<iostream>
using namespace std;
int main ()
{
    double length1 , length2 ,length3;

    cin>>length1>>length2>>length3;

    if((length3*length3)==((length1*length1)+(length2*length2))||
        (length1*length1)==((length3*length3)+(length2*length2))||
        (length2*length2)==((length3*length3)+(length1*length1)))
        cout<<"right"<<endl;
    else
    {
        cout<<"wrong"<<endl;
    }
    return 0;
}
```

## D. Back to High School Physics

time limit per test: 2 seconds

memory limit per test: 64 megabytes

input: standard input

output: standard output

A particle has initial velocity and constant acceleration. If its velocity after certain time is  $v$  then what will its displacement be in twice of that time?



### Input

The input will contain two integers in each line. Each line makes one set of input. These two integers denote the value of  $v$  ( $-100 \leq v \leq 100$ ) and  $t$  ( $0 \leq t \leq 200$ ) ( $t$  means at the time the particle gains that velocity)

### Output

For each line of input print a single integer in one line denoting the displacement in double of that time.

### Sample test(s)

<b>input</b>
0 0
<b>output</b>
0
<b>input</b>
5 12
<b>output</b>
120



```
#include <iostream>
using namespace std;
```

```
- int main()
{
    int time, velocity;

    cin >> time >> velocity;

    cout << time*velocity * 2 << endl;

    return 0;
}
```

## I. 01-09-Alarm Clock

time limit per test: 2 seconds

memory limit per test: 64 megabytes

input: standard input

output: standard output

Daniela is a nurse in a large hospital, which causes her working shifts to constantly change. To make it worse, she has deep sleep, and a difficult time to wake up using alarm clocks. Recently she got a digital clock as a gift, with several different options of alarm sounds, and she has hope that it might help solve her problem. But, lately, she's been very tired and want to enjoy every single moment of rest. So she carries her new clock to every place she goes, and whenever she has some spare time, she tries to sleep, setting her alarm clock to the time when she needs to wake up. But, with so much anxiety to sleep, she ends up with some difficulty to fall asleep and enjoy some rest.

A problem that has been tormenting her is to know how many minutes of sleep she would have if she felt asleep immediately and woken up when the alarm clock ringed. But she is not very good with numbers, and asked you for help to write a program that, given the current time and the alarm time, find out the number of minutes she could sleep.

### Input

The input contains several test cases. Each test case is described in one line, containing four integers  $H1$ ,  $M1$ ,  $H2$  and  $M2$ , with  $H1 : M1$  representing the current hour and minute, and  $H2 : M2$  representing the time (hour and minute) when the alarm clock is set to ring

( $0 \leq H1 \leq 23$ ,  $0 \leq M1 \leq 59$ ,  $0 \leq H2 \leq 23$ ,  $0 \leq M2 \leq 59$ ).

### Output

For each test case, your program must print one line, containing a single integer, indicating the number of minutes Daniela has to sleep.

### Sample test(s)

input
1 5 3 5
output
120

```

#include<iostream>
using namespace std;
int main()
{
    int H1,H2,M1,M2;
    int num_of_min=0;
    cin>>H1>>M1>>H2>>M2;
    if(H2 == 0)
        H2=24;
    int x= H1*60 + M1;
    int y = H2*60 + M2;
    num_of_min += y-x;
    if(num_of_min < 0)
        num_of_min += 1440;

    cout<<num_of_min<<endl;

    return 0;
}

```

$$24*60=$$

$$\underline{1440} \rightarrow$$

## H. 01-08-Odd Sum

time limit per test: 2 seconds

memory limit per test: 64 megabytes

input: standard input

output: standard output

Given a range  $[a, b]$ , you are to find the summation of all the odd integers in this range. For example, the summation of all the odd integers in the range  $[3, 9]$  is  $3 + 5 + 7 + 9 = 24$ .

### Input

Each test case consists of 2 integers  $a$  and  $b$  ( $0 \leq a \leq b \leq 100$ ) in two separate lines.

### Output

For each test case you are to print one line of output - the summation of the odd integers in the range  $[a, b]$ .

### Sample test(s)

<b>input</b>
1 5
<b>output</b>
9
<b>input</b>
3 5
<b>output</b>
8

```
#include <iostream>
using namespace std;
```

```
int main()
{
    int n1, n2, result=0;
    cin>>n1>>n2;
    for (int i= n1; i<=n2; i++)
    {
        if (i%2 !=0)
            result+=i;
    }
    cout<<result<<endl;
}
```

## D. 02-04-Summing Digits

time limit per test: 2 seconds

memory limit per test: 64 megabytes

input: standard input

output: standard output

For a positive integer  $n$ , let  $f(n)$  denote the sum of the digits of  $n$  when represented in base 10. It is easy to see that the sequence of numbers  $n, f(n), f(f(n)), f(f(f(n))), \dots$  eventually becomes a single digit number that repeats forever. Let this single digit be denoted  $g(n)$ .

For example, consider  $n = 1234567892$ . Then:

$f(n) = 1+2+3+4+5+6+7+8+9+2 = 47$   $f(f(n)) = 4+7 = 11$   $f(f(f(n))) = 1+1 = 2$  Therefore,  $g(1234567892) = 2$ .

### Input

Each line of input contains a single positive integer  $n$  at most 2,000,000,000.

### Output

For each such integer you are to output a single line containing  $g(n)$ .

### Sample test(s)

<b>input</b>
2
<b>output</b>
2

  

<b>input</b>
11
<b>output</b>
2

```
#include <iostream>
using namespace std;
```

```
= int main()
{
    int n, sum = 0;
    cin >> n;
    while (n > 0)
    {
        sum += n % 10;
        n /= 10;
    }

    cout << sum << endl;
}

```

## C. 02-03-Feynman

time limit per test: 2 seconds

memory limit per test: 64 megabytes

input: standard input

output: standard output

Richard Phillips Feynman was a well known American physicist and a recipient of the Nobel Prize in Physics. He worked in theoretical physics and also pioneered the field of quantum computing. He visited South America for ten months, giving lectures and enjoying life in the tropics. He is also known for his books "Surely You're Joking, Mr. Feynman!" and "What Do You Care What Other People Think?", which include some of his adventures below the equator.

His life-long addiction was solving and making puzzles, locks, and cyphers. Recently, an old farmer in South America, who was a host to the young physicist in 1949, found some papers and notes that is believed to have belonged to Feynman. Among notes about mesons and electromagnetism, there was a napkin where he wrote a simple puzzle: "how many different squares are there in a grid of  $N \times N$  squares?".

In the same napkin there was a drawing which is reproduced below, showing that, for  $N=2$ , the answer is 5.



### Input

The input contains several test cases. Each test case is composed of a single line, containing only one integer  $N$ , representing the number of squares in each side of the grid ( $1 \leq N \leq 100$ ).

The end of input is indicated by a line containing only one zero.

### Output

For each test case in the input, your program must print a single line, containing the number of different squares for the corresponding input.



```
#include <iostream>
```

```
using namespace std;
```

```
- int main()  
{  
    int x;  
  
    while (cin >> x && x>0)  
    {  
        int sum = 0;  
        for (int i = 1; i <= x; i++)  
            sum += i*i;  
  
        cout << sum << endl;  
    }  
}
```

## I. 02-09-Triangle Wave

time limit per test: 1 second

memory limit per test: 64 megabytes

input: standard input

output: standard output

In this problem you are to generate a triangular wave form according to a specified pair of Amplitude and Frequency.

### Input

The input begins with a single positive integer  $T$  on a line by itself indicating the number of the cases following ( $1 \leq T \leq 20$ ), each of them as described below.

Each input set will contain two integers, each on a separate line  $n, m$ . The first integer is the Amplitude; the second integer is the Frequency ( $0 \leq n, m \leq 100$ ).

### Output

For each test case, the output must follow the description below.

For the output of your program, you will be printing wave forms. The total number of wave forms equals the Frequency, and the horizontal "height" of each wave equals the Amplitude. The Amplitude will never be greater than nine.

The waveform itself should be filled with integers on each line which indicate the "height" of that line.

### Sample test(s)

input
1 3 2
output
1 22 333 22 1 1 ??

```
#include <iostream>
using namespace std;
int main()
{
    int k, amplitude, frequency;
    cin >> k;
    for (int n=1; n<=k; n++)
    {
        cin >> amplitude >> frequency;
        for (int i = 0; i < frequency; i++)
        {
            for (int j = 1; j <= amplitude; j++)
            {
                for (int z = 1; z <= j; z++)
                {
                    cout << j;
                    cout << endl;
                }
            }
            for (int j = amplitude-1; j >= 1; j--)
            {
                for (int z = 1; z <= j; z++)
                {
                    cout << j;
                    cout << endl;
                }
            }
        }
    }
}
```