# Exercises: Basic Syntax

This document defines the exercises for the ["C++ Fundamentals" course @ Software University](https://softuni.bg/trainings/3657/cpp-fundamentals-march-2022). Please submit your solutions (source code) of all below-described problems in [Judge](https://judge.softuni.org/Contests/2939/CPlusPlus-Basic-Syntax).

# Order Two Numbers

Write a program that reads two integers from the console and prints them in increasing order.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 1 2 | 1 2 |
| 1 -1 | -1 1 |
| 4242 1313 | 1313 4242 |

# Product Sign

Write a program that shows the sign (+ or -) of the product of three real numbers without calculating it.

The program should read 3 real numbers from the console (on a single line, separated by spaces) and should print the sign of their product (i.e. the sign of the number resulting from the multiplication of the 3 numbers). If the product is 0, print +.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 1 2 0 | + |
| 1 -1 1 | - |
| -411531.13 123123 -8673.24 | + |

# Quadratic Equation

Write a program that enters the coefficients **a**, **b,** and **c** of a quadratic equation **a\*x2 + b\*x + c = 0** and calculates and prints its real roots. Note that quadratic equations may have **0**, **1,** or **2** real roots. You can check your program against this: <https://www.mathsisfun.com/quadratic-equation-solver.html>

The numbers **a**, **b**, and **c** will be entered on a single line from the console, separated by spaces.

If the quadratic equation has no real roots (e.g. if the Discriminant is less than 0), print "**no roots**", if it has one real root print it, if it has two roots, print them on a single line, separated by a single space

### Examples

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **Explanation** |
| 2 5 -3 | -3 0.5 | Equation: 2x2 + 5x - 3 = 0 |
| 10 1 3 | no roots | Equation: 10x2 + x + 3 = 0 |
| 0.5 5 12.5 | -5 | Equation: 0.5x2 + 5x + 12.5 = 0 |

# 1 to N

Write a program that reads the integer number N from the console and prints all numbers from 1 to N (i.e. in the range [1, N]) to the console on a single line. The number N will always be larger than or equal to 1.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 1 | 1 |
| 10 | 1 2 3 4 5 6 7 8 9 10 |

# Min and Max

Write a program that reads an integer number N, then reads a line of N integers, and prints the minimum and maximum of those integers.

### Examples

|  |  |
| --- | --- |
| **Input** | **Output** |
| 2  -1 5 | -1 5 |
| 7  5 3 44 21 69 2 10 | 2 69 |

# Greatest Common Divisor

### Write a program that calculates the greatest common divisor (GCD) of given two numbers. Hint: you can use the Euclidean algorithm.

The two integer numbers will be entered on a single line from the console, separated by a single space.

Find and print their GCD.

### Examples

|  |  |  |
| --- | --- | --- |
| **Input** | **Output** | **Explanation** |
| 25 10 | 5 | 5 is the largest number that divides both 25 and 10 (without a remainder) |
| 50 50 | 50 | Both numbers are 50, so GCD is 50 |
| 7 13 | 1 | 7 and 13 are prime numbers, meaning they only divide by 1 and themselves, so their GCD is 1 |