

03. Strings and Streams – Homework Exercises

Write C++ code for solving the tasks on the following pages.

Code should compile under the C++03 or the C++11 standard.

Please submit a single **.cpp** file for each task.

.cpp files for the tasks should be named with the task number followed by what you feel describes the exercise in a few words.

E.g. a good name for task 2 of this homework would be:

2.mathematical-expression.cpp

Don't worry about the name too much, just make sure the number and the file extension are correct.

Problem 1 – Compare Arrays Again

Write a program that reads two integer arrays from the console and compares them element by element. For better code reusability, you could do the comparison in a function, which returns **true** if they are equal and **false** if not.

Each array will be defined by a single line on the console, containing the numbers in the array, separated by spaces.

Print **equal** if the arrays match, and **not equal** if the arrays don't match.

Examples

Input	Output
1 2 3 1 2 3	equal
1 2 3 2 1 3	not equal
10 1 42 13 69	not equal

Problem 2 – Mathematical Expression

Write a program that reads a line from the console containing a mathematical expression. Write a **bool** function that checks whether the brackets in the expression () are placed correctly (assume everything else is correct, i.e. you don't need to check for correct signs, correct variables/numbers, etc.) and returns **true** if they are correct and **false** if they are not correct. Print **correct** or **incorrect** accordingly on the console

Examples

Input	Output
((a+b)/5-d)	correct
a+b	correct
a+(b)	correct
((a+b)/5-d	incorrect
(a+b	incorrect

Problem 3 – Title Case

Write a program which changes each word in a text to start with a capital letter (don't bother with the exact title-case rules about not capitalizing things like in, from, etc.). Assume the first letter of a word is an English alphabetical symbol preceded by a non-alphabetical symbol (so in "we will--rock you", "we", "will", "rock" and "you" are all considered words which need to be capitalized).

Examples

Input	Output
On the south Carpathian mountains,a tree is swinging	On The Couth Carpathian Mountains,A Tree Is Swinging
Write a program which changes each word in	Write A Program Which Changes Each Word In

Problem 4 – Replace All

Write a program which is given a line of text, another line with a "find" string and another line with a "replace" string. Any part of text which matches the "find" string should be replaced with the "replace" string. Print the resulting text on the console.

Examples

Input	Output
I am the night. Dark Night! No, not the knight night day	I am the day. Dark Night! No, not the kday

Problem 5 – Invalid Input

Write a program which reads a line containing integer numbers, separated by spaces, and prints their sum. In addition to the numbers, each line will contain one or more words (sequences of English letters) – print those words on a separate line, separated by spaces, after the sum, in the order they were in the input.

Examples

Input	Output
1 2 3 invalid 4	10 invalid
H 2 adasashd oneTwo -1 4	5 H adasashd oneTwo
0 HELLO 13 -5 ten 10 14 Noise	32 HELLO ten Noise

Problem 6 – The Signal and the Noise

Write a program which reads a sequence of non-negative integer numbers (in the decimal numeral system), separated by spaces, and finds the maximum number. The numbers in the input may have "noise" – symbols before, after, or between the digits of the number, which are not decimal digits (you need to ignore these when reading the numbers). All symbols in the input will be either letters, digits, punctuation, or signs from the standard ASCII table (no control symbols like newlines or tabs, delete, etc.)

Examples

Input	Output	Explanation
5a3 1f a0aaaa f1fg3	53	The numbers are 53 1 0 13, of which 53 is the max
1 2 3	3	The numbers are 1 2 3, of which 3 is the max
1.][.3 5--aA3:)5 2asd=@14	535	The numbers are 13 535 214, of which 535 is the max

Problem 7 – The Noise and the Signal

Same as Problem 6, but your task here is to find the longest noise in a number (numbers will always be positive integers). There are several noises with equal length, print the one that is the first lexicographically. If there are no noises, print "no noise". All symbols in the input will be either letters, digits, punctuation, or signs from of the standard ASCII table (no control symbols like newlines or tabs, delete, etc.)

Examples

Input	Output	Explanation
5bbbb3 1f a0aaa f1fg3	aaaa	The noises are bbbb f aaaa ffg, aaaa and bbbb are equal length, but aaaa is before bbbb lexicographically
1 2 3	no noise	
1.][.3 5-aA3:)5 2asd=@14	-aA:)	The noises are .][. -aA:) asd=@, of which -aA:) and asd=@ are of equal max length (5), but in the ASCII table, the - sign ("hyphen-minus") is before the letter a, so -aA:) is the first lexicographically