

05. Associative Containers and STL Algorithms

– 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.odd-occurrences.cpp

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

Task 1 - Count Real Numbers

Read a **list of real numbers** and **print them in ascending order** along with their **number of occurrences**.

Examples

Input	Output
8 2.5 2.5 8 2.5	2.5 -> 3 8 -> 2

Input	Output
1.5 5 1.5 3	1.5 -> 2 3 -> 1 5 -> 1

Input	Output
-2 0.33 0.33 2	-2 -> 1 0.33 -> 2 2 -> 1

Task 2 – Odd Occurrences

Write a program that extracts from a given sequence of words all elements that appear in it an **odd number of times** (case-insensitive).

- Words are given in a single line, space separated.
- Print the result elements in lowercase, in their order of appearance.

Examples

Input	Output
Java C# PHP PHP JAVA C java	java, c#, c
3 5 5 hi pi HO Hi 5 ho 3 hi pi	5, hi
a a A SQL xx a xx a A a XX c	a, sql, xx, c

Task 3 – Largest 3

Read a **list of real numbers** and **print largest 3 of them**. If less than 3 numbers exist, print all of them.

Examples

Input	Output
10 30 15 20 50 5	50 30 20

Input	Output
20 30	30 20

Task 4 – Short Words

Read a **text**, extract its **words** (separated by spaces) find all **short words** (less than 5 characters) and print them **alphabetically**, in **lowercase**, separate by a single comma and a single space

- Use case-insensitive matching.
- Remove duplicated words.

Examples

Input	Output
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Task 5 – Sort Numbers

Read a **list of decimal numbers** and **sort** them in increasing order. Print the output as shown in the examples below.

Examples

Input	Output
8 2 7 3	2 <= 3 <= 7 <= 8
2 4 -9	-9 <= 2 <= 4

Task 6 – Squares

Read a **list of integers** and **extract all square numbers** from it and print them in **descending order**. A **square number** is an integer which is the square of any integer. For example, 1, 4, 9, 16 are square numbers.

Examples

Input	Output
3 16 4 5 6 8 9	16 9 4
1 9 4 16 8 25 49 16	49 25 16 16 9 4 1

Task 7 - Miners

You are given a sequence of strings, each on a new line. Every odd line on the console is representing a resource (e.g. Gold, Silver, Copper, and so on), and every even – quantity. Your task is to collect the resources and print them each on a new line.

Print the resources and their quantities in format:

{resource} -> {quantity}

The quantities inputs will be in the range [1 ... 2 000]

Examples

Input	Output	Input	Output
Gold	Gold -> 155	gold	gold -> 170

155	Silver -> 10
Silver	Copper -> 17
10	
Copper	
17	
stop	

155	silver -> 10
silver	copper -> 17
10	
copper	
17	
gold	
15	
stop	