

Objects and Classes – Exercise

Please submit your solutions (source code) to all below-described problems in [Judge](#).

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

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

1. Sentence Shifter

You are given a **list of words** in one line. On the other line, you are given a **simple integer**.

Your role is to **shift the words** in the sentence **according to that integer**.

For an example, if a sentence has 10 words and you receive a shift number 2 - the first word should become the third, the second word should become the fourth and so on, ..., the word before the last should become the first and the last word should become the second.

Implement this task with a class that is initialized with a **linear container** (array, vector, etc.) of words and which has a **getShiftedSentence()** method which returns the words shifted.

Each word is printed on a different line.

Examples

Input	Output
Welcome to SoftUni and have fun learning programming 2	learning programming Welcome to SoftUni and have fun

2. Distance

Write a program to calculate the (Euclidean) distance between two points $p_1 \{x_1, y_1\}$ and $p_2 \{x_2, y_2\}$. You should write a class to represent such points and a method in it that calculates the distance from the point to another point.

Examples

Input	Output
3 4 6 8	5.000
3 4 5 4	2.000
8 -2 -1 5	11.402

3. Sales

Write a class **Sale** holding the following data: **town**, **product**, **price** and **quantity**. Read a **list of sales** and calculate and print the **total sales by the town** as shown in the output. Order the towns **alphabetically** in the output.

Examples

Input	Output	Comments
5 Sofia beer 1.20 160 Varna chocolate 2.35 86 Sofia coffee 0.40 853 Varna apple 0.86 75.44 Plovdiv beer 1.10 88	Plovdiv -> 96.80 Sofia -> 533.20 Varna -> 266.98	Plovdiv -> $1.10 * 88 = 96.80$ Sofia -> $1.20 * 160 + 0.40 * 853 = 533.20$ Varna -> $2.35 * 86 + 0.86 * 75.44 = 266.98$

4. Total average of students

Write a program, use a class that has params:

- Student Name
- Student Surname
- Total Average

The class should have **print** method that for a given object prints all the information.

Create a vector in **main()** that for a given number (passed thru user) saves the objects

Make a function that calculates the Total **average** of **all** students.

If there are no students, print "**Invalid input**".

Explanation:

Number of students – 2

Name – Maria

Surname – Ivanova

Average – 3.5

Name – Dragan

Surname – Ivanov

Average – 4.5

TOTAL AVERAGE – $(3.5 + 4.5) / 2 = 4$

Examples

Input	Output
2 Maria Ivanova 3.5 Dragan Ivanov 4.5	Maria Ivanova 3.5 Dragan Ivanov 4.5 4