

08.Classes and Objects – 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.distance.cpp

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

Tasks 4 in this homework requires you to be creative about the implementation. It simulates real-world examples of non-strict and sometimes vague descriptions of client requirements. Part of the exercise is to learn to convert paragraphs of text into classes which solve the needs described in the paragraphs, and writing code which is easily modified if, for example, the format of the input/output data changes slightly. Also note that some of these exercises mention e.g. "array" or "string" and so on – do not take these literally, you can use any data structures you find appropriate.

Task 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 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

Task 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 which 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

Task 3 – Sales

Write a class **Sale** holding the following data: **town**, **product**, **price**, **quantity**. Read a **list of sales** and calculate and print the **total sales by 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 -> $2.35 * 86 + 0.86 * 75.44 = 266.98$

