

The content of this project is NOT in the public domain! Do not post any content of this project to any internet sites or make it public in any other form. By enrolling in this course you agree to honor this request.

MCS 360 Project 1

This project consists of two problems. Each problem is worth 25 points.

Problem 1. Write a main function in which a user is prompted repeatedly to enter an arbitrary number of **positive** integers n , greater than 0, one after another. The prompt works as long as the user does not enter 0. If 0 is entered, then the prompt ends. While the prompt is ongoing, each entered integer (except 0) is stored in an array, called A . Fix the maximum size of the array to be 100, that is, we will assume that the user will not enter more than 100 array elements.

Next, write a function *remove*, which takes the array A , integer n (the size of the array A), and integer k as input arguments. The function *remove*, removes any multiples of integer k that are contained in the array A , and returns a new array, called B , which is free of the multiples of k .

Lastly, write a function *sum*, which takes the array A , integer n (the size of the array A) and returns the sum of all values in the array B , returned by the function *remove*.

The function *remove* and *sum* are called inside the main function. Call the *sum* function within a **cout** statement to show the output.

[Problem 2] As an example, consider a 2D array of the form $\{\{9,6,4\},\{1,2,5\},\{8,3,9\},\{2,7,5\},\{1,2,4\}\}$. Write a C++ function which takes an arbitrary 2D array A of the same form as in the example and **modify** the entries of the array, such that the values in the sub-arrays are sorted. That is, the function would modify the array in the example such that it becomes $\{\{4,6,9\},\{1,2,5\},\{3,8,9\},\{2,5,7\},\{1,2,4\}\}$. Note that you are asked to modify the original array! You are **not** being asked to create a copy of the array, sort it, and then return the copy!

The 2D array will always consist of sub-arrays, containing exactly three integers but there can be an arbitrary number of sub-arrays, not necessarily five, as in the example.

The function which modifies the array should be called *sorter*. The *sorter* function should take on input the array (hint: pointers), and the size (the number of sub-arrays) of the array as an integer. In addition, write a function called *show*, which is capable of printing to screen a 2D array exactly as given in the example, along with the curly brackets { and }.

Define a main function, in which the example array above is defined, and call the *sorter* function and the *show* function in order to illustrate that your code works.

Project Guidelines and Submission Details

This project is due on **due Saturday, February 5, 2022 at 11:59 PM**.

Your solution to this project must consist of two files: a **TEXT** document, called **problem1.txt**, containing the C++ that solves Problem 1 **AND** **problem2.txt**, containing the C++ that solves Problem 2. Upload both files through Blackboard. **No other format will be accepted.** We need the *text* (.txt)

format to check for plagiarism. Not submitting both files in the *text* format will result in zero points on the whole project assignment.

This project must be solved **individually**. Under no circumstances are you allowed to copy or to collaborate with anyone else. All submitted files will be automatically checked for plagiarism. Regardless of who copied from whom, all caught in the act of plagiarism will be penalized. In particular, using internet resources is off limits. However, you are free to use our course resources, such as lecture notes and the course material listed on our syllabus during the solving of this project.

If you have questions about this project, come to my online office hours, using the usual Blackboard link.