Name: _____

Problem	Points	Score
1	50	
2	50	
Total	100	

Notes:

(1) The first step in this exam is to create a workspace in the following directory:

/data/courses/ece_1111/current/exams/ex_02

Your directory should be your last name all lowercase, followed by an underscore, following by your first name (e.g, "picone_joseph"). Set the permissions using "chmod u+rwx,g-rwx,o-rwx <lastname>" so only you have read and write permission to this directory. Create subdirectories within this directory: p01, p02, … You will use these for problems 1 and 2, … respectively. Put ALL your code in these directories. Do not touch your files after the exam is over.

(2) For this exam you are allowed to open a terminal window on your computer, you are allowed to web surf with Google, but you cannot use online chat, ChatGPT or other interactive services. Your code must be your own original work.

(3) All your solutions should use a make file, a header file, a driver program (e.g., p01.cc), and an implementation file (e.g., p01_00.cc). Your executable should be named *.exe (e.g., p01.exe).

(50 pts) Problem No. 1:

Start with the code here:

    /data/courses/ece_1111/current/exams/ex_02/picone_joseph/p01

Write a program that takes three arguments from the command line:

    p01.exe 3 4 5

The main program calls a function named "allocate_matrix" that creates a 3D array of floats inside the function and returns the memory to the main program. Your main program should populate the 3D array and print its values.

You are free to modify the function allocate_matrix anyway that you need to. You also need to allocate the matrix in your driver program to hold float values.

But do not change the main program beyond that.

(50 pts) Problem No. 2:

Copy your p01 solution to p02. Rename files appropriately. Add a new function, resize_matrix, that takes your existing matrix and changes the dimensions to new values – dim4, dim5, dim6. Memory reallocation must be done in the function, not in the main program. Make sure you delete the old space and create the new space inside the function. Your resize function should not introduce any memory leaks.

Call resize_matrix immediately after allocate_matrix, and loop over dim4, dim5 and dim6 to verify it worked.

Your program should accept dim1 – dime6 from the command line:

    p02.exe 3 4 5 3 2 1

The output should use the same print code from p01.