MTH 4300: Algorithms, Computers, and Programming II

HW #2

Due Date: October 3rd, 2024

Inside of git repo check under folder hw_solutions you can find a file named hw2_template.cpp to help guide you

1 Implement a Dynamic 2D Array (Matrix) Using Pointers

Write a C++ program to dynamically create a 2D array (matrix) of integers of size m x n using dynamic memory allocation. You should:

- Ask the user to input the number of rows (m) and columns (n).
- Dynamically allocate memory for the 2D array.
- Initialize the 2D array with some values (e.g., fill with consecutive numbers).
- Print the matrix to the console.
- Deallocate the memory properly after use to avoid memory leaks.
- Handle edge cases where the user might input invalid sizes (like 0 or negative values).

2 Recursion

Write a recursive function to compute the sum of all elements in an array of integers, the input parameters to the function should just be the array of any size, and the function should return the sum as an int. Note, I will test your function with arrays of different sizes. No user input is required for this question.

3 Arrays

You are given two arrays of integers, arr1 and arr2, each of size n. Write a C++ function that checks if arr2 is a rotation of arr1. For example, if arr1 = {1, 2, 3, 4, 5} and arr2 = {3, 4, 5, 1, 2}, then arr2 is a rotation of arr1. The input parameters to the function should be the two int arrays of any size n and you should return a bool, true if it is a rotation and false otherwise. Note, I will test your function with arrays of different sizes. No user input is required for this question.