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CSCI 3240

Extra Credit Project

Write a program using multi-level and multi-dimension array. Use equal amount memory for both. Then using data from gprof determine which is better from a time complexity. Write a short report detailing analysis and results.

For this Assignment, I created a 1000x1000 2-dimensional array and a 1000000 byte multi-level memory array. `(int ndArray[SIZE][SIZE]; int **nMultiLevelMemory = (int**)malloc(sizeof(int*) * SIZE * SIZE);` Both arrays were initialized to the same values.

I executed the application multiple times. Gprof did not reveal much that was interesting. The execution time was so short that it didn't register a difference between the 2 functions, so I added additional touch points to clock the beginning and end time of each algorithm and calculated the time elapsed. Each time I got varied results as to which approach would execute quicker. Here are some example outputs:

Sum2DArray execution time: 0.004001 seconds

SumnMultiLevelMemory execution time: 0.000000 seconds

Sum2DArray execution time: 0.000000 seconds

SumnMultiLevelMemory execution time: 0.004108 seconds

I cannot account for the reason for the flip-flopping of the time for each method during each execution of the test program, but each execution time of the function with the greater execution time always varied by +/- 0.0001 seconds. I don't really have enough data point to come to a reasonable conclusion as to which is better, but The 2 functions are comparable.