CS2292 Lab 0

January 20, 2021

Question 1.

Compile the attached program *ast.cpp* using: *g++ -O0 -o astO0.out ast.cpp* and *g++ -O3 -o astO3.out ast.cpp*. Compare the size of the binaries, and the runtimes.

Question 2.

Add a statement to print the value of the sum (at the end of the computation) in the code. Compile and compare the runtimes.

Question 3.

Interchange i and j when accessing the array. Compile with *-O0*. Run each version of the code atleast for ten times, and take the average runtime. Compare the runtimes between the two versions. Change the value of N, and repeat the experiment. Plot a graph (x-axis: N and y-axis: Time).

Question 4.

Implement a program to store 10000 elements. Version 1: Using *int arr[10000]*. Version 2: Using linked list. Traverse the array to fill it by a random number. Compare the runtimes for both the versions. Implement a program to store N elements without using linked lists (Note that the value of N changes dynamically) i.e., the array grows/shrinks during the execution of the program. Compare the runtime with Version 2.

Question 5.

Implement matrix multiplication (input as square matrices). Compile and record the runtime. Can you optimize the code to make it run faster?