

# Programming 2 Assignment

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## Introduction

## Implementation Details

## Theoretical Analysis

## Experimental Setup

Timing tests were conducted using the provided `timing.cpp`, compiled with the provided `makefile`'s commands. Compilation was done on the “linux.cse.tamu.edu” server, with G++ version 4.7.3 (SUSE Linux) (found via `g++ -version`). Compilation was set to the C++11 standard, with the `-G` flag enabled and `O2` optimization level, warnings set to `-Wall -Werror` (all warnings treated as compilation errors), and dependencies flagged with `-MMD` (auto-generate dependencies).

Tests were run on the “compute.cse.tamu.edu” server, which runs Arch Linux x86\_64 version 8.12 (found via `arch -version` and `lsb_release -a`). This server has 99026668 total kilobytes of RAM (found via `free`). It uses Intel Core i7-3970X CPUs (2 sockets, 8 cores per socket, 2 threads per core), with a clock speed of 2000 mHz (found via `lscpu`). Each core has a Xeon E5-2650 processor (found via `lshw -short`).

Timing functions output timings for input sizes that were powers of 2, starting from 2 itself, and ending at a maximum size specified by the user. Each step of the timing was repeated 10 times, and the average of each result taken. Linear height `n` inserts went up to a maximum input size of 32768; logarithmic height `n` inserts went up to a maximum input size of 4194304, and random `n` inserts went up to a maximum input size of 1048576.

**Results and Discussion**

**Conclusion**