BLG 335E: Analysis of Algorithms I Project 1 Report

Compiling & running:

- To compile:
    - g++ Data.cpp Data.h main.cpp
- To run:
    - ./a.out –algo A –feature F –size N
        - A = 'm' for merge sort, 'i' for insertion sort
        - F = 'p' for last_price, 't' for time_stamp;
        - N = number of lines.
        - (without single quotation marks);

a. Asymptotic upper bounds:

    i. Merge Sort:
- O(n*logn)
-
    1. It takes log2(n) steps to divide the input,
    2. log2(n) + 1 quotients.
    3. It takes n steps to merge,
    4. So c*n*(log2(n) + 1)
    5. = cnlog(n) + cn
    6. Then it is O(nlogn).

    ii. Insertion Sort:
- O(n^2)

b. Running each algorithm 10 times for each N:

N	1000	10 000	100 000	1 000 000
Merge Sort				
Insertion Sort				