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Time Complexity Report

# Insertion Graphs

Graphs for the time it took to insert the files into the dictionary. Both graphs are linear, and I believe they are O(n).

## Ordered Files

The graph is consistent to the O(n) line with a few outliers, this could have been due to the computer that I ran the program on. The performance grows linearly and in proportion to the size of the file. I can assume that with a larger sample size it would line up better to the linear (white) line.

## Random Files

The graph is consistent to the O(n) line with a few outliers, this could have been due to the computer that I ran the program on. The performance grows linearly and in proportion to the size of the file. I can assume that with a larger sample size it would line up better to the linear (white) line.

# Finding Graphs

Graphs for the time it took to find a word in the dictionary. Both graphs seem to be a straight line with outliers.

## Ordered Files

The graph is O(1) but due to the computer there are a lot of outliers. This program will execute at the same time regardless of the size of the data. I assume that it will level out with a larger sample size so this is what was expected.

## Random Files

The graph is O(1) but due to the computer there are a lot of outliers. This program will execute at the same time regardless of the size of the data. I assume that it will level out with a larger sample size so this is what was expected.

# Selection Sort Graphs

This graph is O(n2) quadradic runtime that is proportional to the square of the size. I had some issues with my graph, so I don’t think it’s an accurate representation of O(n2). This graph is not what was expected.

# Merge Sort Graphs

This graph is O(logn) logarithmic runtime that is increased by one when the size of input is doubled. Once again, I had some issues with my graph, but it somewhat has the correct shape. This graph is not quite what was expected.