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Project 3 Analysis

Algorithm A - Loops that grow proportionally to the input size(n) have a linear time complexity, so algorithm A is O(n).

Algorithm B – Although B is a nested loop, the inner loop is not affected by input(n), so it is a constant, making algorithm B O(n)

Algorithm C – Constant time algorithms take the same amount of time no matter what the input value(n) is. This algorithm is O(1).

Trendlines are added in the charts to better see the overall trend of each algorithm.

Algorithms A and B are both Linear and can be seen having similar looking charts. Algorithm B is much faster than A which is attributed to a constant (in the form of a for loop) being involved in its respected equation. Algorithm C is constant complexity which can be identified by observing the equation. The chart may not show this kind of trend exactly, as it seems to be a negative linear slope on the trendline. However, all the middle values do range around 1600000ns and just seem to bounce up and down between 1000000ns and 2000000ns which would imply a relatively constant trend

Overall, Algorithm B is the fastest followed by Algorithm A and then Algorithm C. Algorithm A and C are extremely close but on average, C takes 1851345.455ns to run while A takes 1851345.455ns to run when using an increment value of 50 and a max value of 500 for each. The complexities of algorithm A and B are very similar as they are both linear, but Algorithm C is Constant, so it is not similar which can be observed on the charts.