**Notes for CS Assessment**

**Step 1**

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| **Arrays** | **Insert Function Time** | **Append Function Time** |
| tinyArray | 133.708 μs | 83.791 μs |
| smallArray | 65.750 μs | 125.625 μs |
| mediumArray | 198.417 μs | 125.333 μs |
| largeArray | 8.940 ms | 545.875 μs |
| extraLargeArray | 1.077 s | 3.940 ms |

**Analysis**

After analyzing the data, I came to the conclusion that the insert function, mainly the unshift method, is slower than the append function or the push method. There is not much of a discrepancy between unshift and push for the first three arrays of tinyArray, smallArray and mediumArray because these arrays are not that large. Thus, our program does not have much difficulty in computing both these functions at a similar rate. However, when we start getting into the bigger arrays, we can see a clear difference in the runtimes between the two functions. For example, the time for unshift for the extraLarge array and the largeArray is 8.940ms and 1.077s while the time for the push method is much faster at 545.875 μs and 3.940 ms respectively. There is already a clear difference in the runtime when looking at array sizes that are at 10000 and 100000, so we can conclude that the runtimes will be even slower for the unshift method in comparison to the push method for even larger arrays such as arrays reaching indexes of 1000000.

**Extra Credit**

The unshift method is much slower to the push method because push only requires one step, while the unshift method has to go through two steps. For example, push merely adds elements to the end of an array, so the indexes of the original elements of the array are unchanged. However, not only does the unshift method add elements to the front of an array, it also has to re-index all the original elements in the array as they have to be shifted to the right as the new elements were introduced to the beginning of the array. Because of this added step, the unshift method becomes much slower in comparison to the push method when the array sizes start to become very large.