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1 Introduction

Sorting is one of the key problems in computer science. Since computers often work with such large swaths of data, it becomes nigh impossible to work with this data without some manner of organization. This project will focus on implementing a variety of sorting algorithms, shell sort, heap sort, quick sort, and batcher sort.

2 Big O Notation

An easy way to compare sorting algorithms is in their speed. We can do so using a measure of duration known as Big O. The above sorting algorithms are generally known to be close to $n \cdot \log(n)$ for their Big O measurement. But they may differ in speed due to some constants. As a hypothesis, I predict the slowest will be batcher sort. This algorithm is known to perform well utilizing parallel processes. In this case we'll be performing the algorithm step by step rather than performing it in parallel. Next I predict to be heap sort, followed by shell sort, then quick sort. Quick sort is known to be the fastest comparison sorting algorithm. Heap sort, while efficient I think requires more time to create the heap first in comparison to shell sort.

3 Pseudocode

The pseudocode o