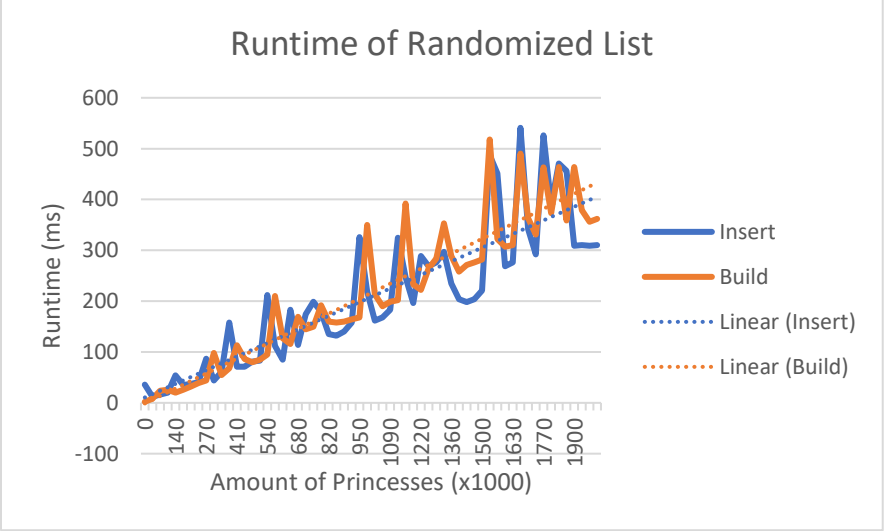
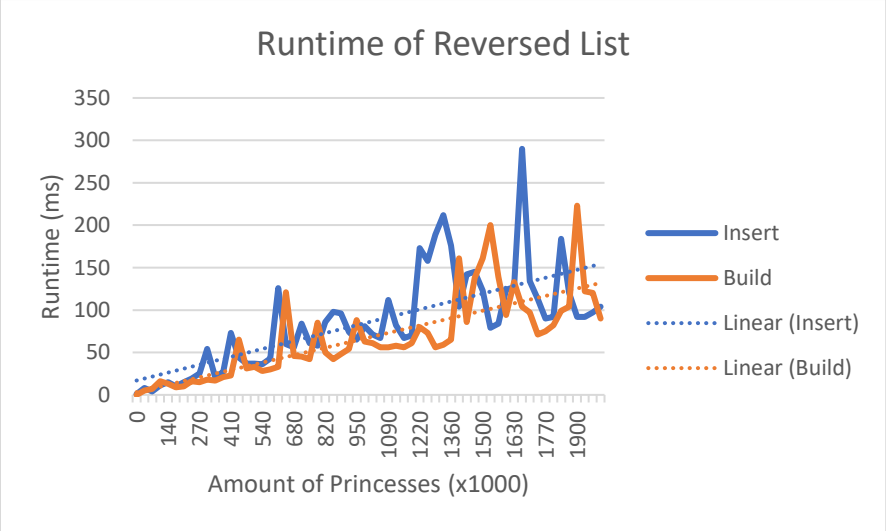
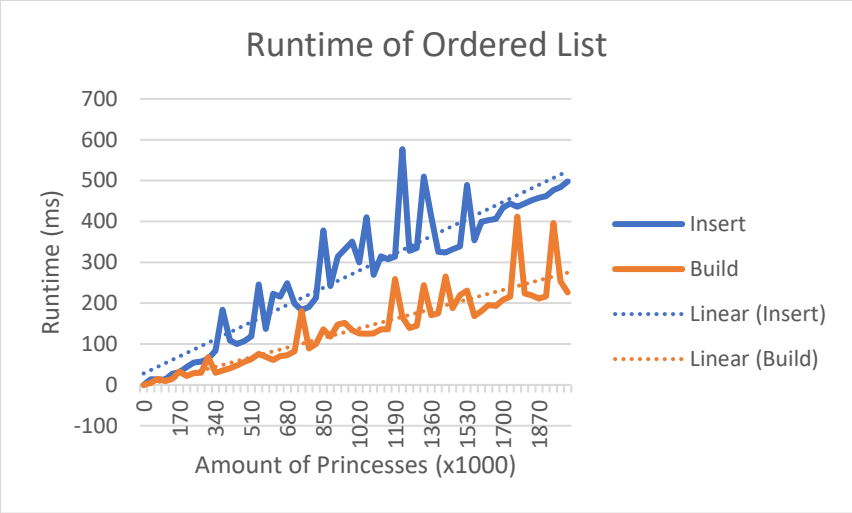
Algorithm Analysis

The goal of this assignment is to analyze the difference in runtime of building a heap with a premade (usually unordered) array versus inserting an item one-by-one into the insertion feature of a heap. Both options have its pros and cons. Here is the runtime in one instance that I acquired from each test:







In the case of the reversed list, there were many outlying peaks, but it was overall more efficient to build a heap rather than inserting.

In the case of the randomized list, it was almost equal throughout except for a few parts where insertion won over building, thus insertion narrowly wins.

The other two tests didn't have too noticeable differences – but the ordered list does! In this case of the ordered list, it was more efficient to take an array and build a heap rather than inserting one-by-one. This is likely due to having to percolate up often which has much more match ratio than percolate down in this case where the "ordered list" means the most powerful princesses first and weakest princesses last.