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Questions:

1. Binary search and trinary search both fall into the O(log n) complexity class. Do your experiments show growth in execution time that is consistent with this?

Yes. Although it may be a bit difficult to see due to the limited amount of experimental data, according to the graphs that I created to model my results, it seems as if both the binary and trinary search functions show a growth pattern very similar to the shape of a log n graph. A log n curve is one that decelerates as n increases. In other words, time goes up linearly while the n goes up exponentially. Any deviation from this pattern may have been caused by the computer itself, which could have slowed down this program's processes in favour of running higher priority programs. And in terms of the design of the experiment itself, it may have been easier to see the log n shape if the n-values weren't so spaced apart, and/or if there were more of them to test and add to the graph.

2. Compare the total time for the two search algorithms:

- **Do they ever differ by more than 10%, or are they always within 10% of each other?**
- **Under what conditions (if any) is binary search at least 10% faster and under what conditions (if any) is trinary search at least 10% faster?**

In both experiments, the time it took binary search to complete was more than 10% faster than trinary search. This is probably due to the fact that there are more comparisons that trinary search has to make than binary search does. The only situation where it wouldn't be more than 10% different is if the list was empty because in that case, the functions would automatically return -1, without doing any comparisons at all. Also, it always took longer for both the binary and trinary searches to complete when the target value wasn't present, as compared to when it was. Again, this would be because there would have to be less comparisons made in the latter.

I confirm that this submission is my own work and is consistent with the Queen's regulations on Academic Integrity.

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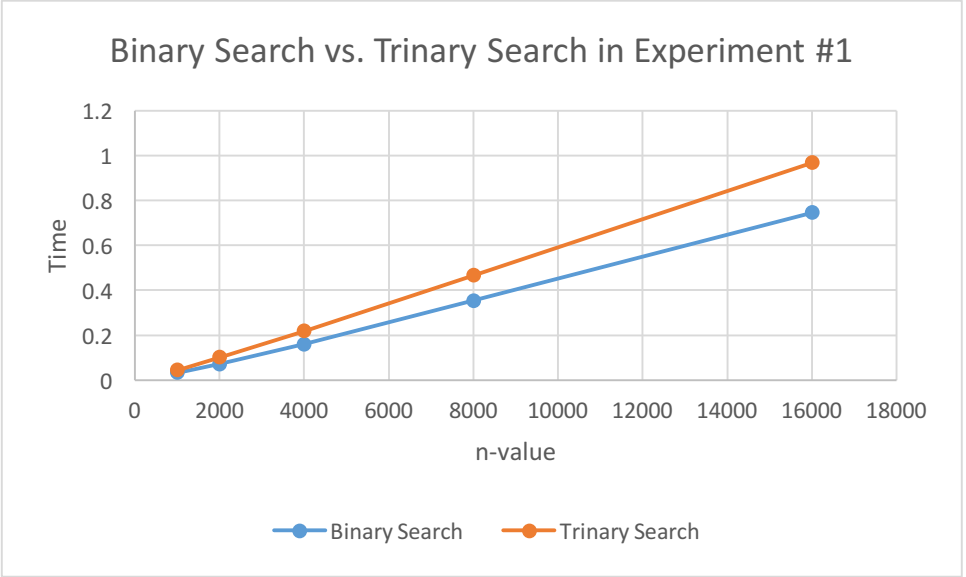
Experiment #1:

n-value	Binary Search Time	Trinary Search Time
1000	0.033023	0.04520099999999999
2000	0.07228199999999996	0.10106800000000005
4000	0.16008299999999975	0.21858999999999984
8000	0.35379700000000014	0.4663580000000005
16000	0.7454529999999977	0.9667710000000014



Experiment #2:

n-value	Binary Search Time	Trinary Search Time
1000	0.039949999999999986	0.05992999999999998
2000	0.08294299999999999	0.128135
4000	0.19424799999999998	0.2993410000000001
8000	0.42582900000000024	0.7347389999999994
16000	0.9082879999999989	1.3243170000000006