Trinary Search

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1 Summary

I took a look at both Binary Search and Trinary Search and implemented to two and tested each one with different input. As discussed before, we know Binary Search is $O(\log n)$, as we kept dividing the data in half until we found the one we are looking for. In Trinary Search, we will divide the data not just once, but in two separate places (this creates 3 different areas) as seen in Figure 1. This makes Trinary Search $O(\log n)$ as well.

2 Evaluation of behavior

So, what's the difference then? Trinary Search will make four comparison while Binary Search will make a max of two comparisons in each iteration. Although Trinary Search cuts the array into three parts and discards two-thirds of space each iteration (which you would think it makes it faster than Binary Search), Trinary Search makes far more comparisons (steps) than Binary Search.

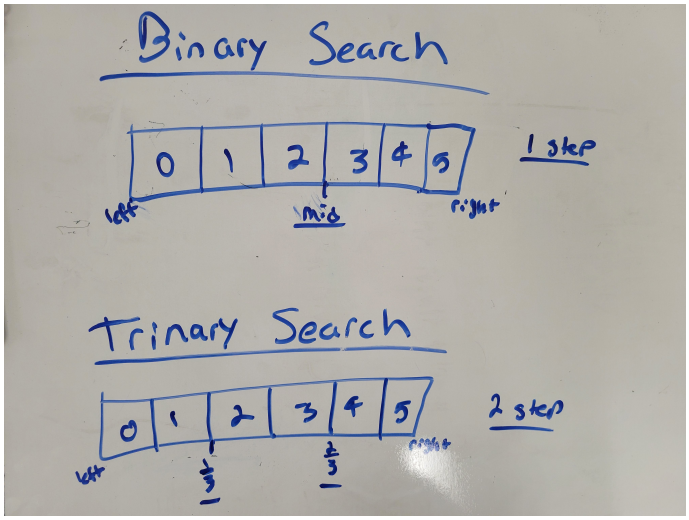

Figure 1: This frog was uploaded via the file-tree menu.

INPUT SIZE	BINARY SEARCH STEPS	TRINARY SEARCH STEPS
10	4	2
50	5	8
100	6	4
1000	9	12
10000	14	18
100000	17	20
1000000	20	24

Table 1: Input size to the worst case behavior of both Binary Search and Trinary Search