

## **Reflection Activity 3.4**

First, it should be mentioned that in general algorithms are very important and powerful tools since they serve to prepare our heads as programmers and also allow us to face any type of problem in order to come up with an efficient and consistent solution. with the type of problem to be solved.

Binary Search Trees require operations in order to function because they are limited on their own. Searching, inserting, removing, and traversing are the common operations related to a BST.

The functions that perform these actions are recursive in nature since this data type is one that is defined recursively.

Binary Search Trees are straightforward data structures, yet they are effective for sorting lists of data because they show how the data are related to one another. Given that the items are sorted, binary search has an  $O(\log(n))$  time complexity for each search on a list of  $n$  items, which is the main reason it is employed.

Binary search is quicker than linear search up to about 100,000 data points. The speed of binary search doubles at 200,000 data points. It moves nine times as quickly with a million data points. It is 5000 times as fast with 1,000,000,000 data points. A search that takes 20 milliseconds using binary search takes 2 minutes using linear search.

For this specific example, you can determine if a network is infected or no by the number of accesses. If the IP has more than 1 count, then it is infected, because it has been repeated more than once in the log file, which means that it has been used more than once to access the server.

*Why is a binary search algorithm considered more important than the less complicated linear search?* (2020). Quora. <https://www.quora.com/Why-is-a-binary-search-algorithm-considered-more-important-than-the-less-complicated-linear-search>

Skotar, M. (2019, September 29). *Importance of Binary Search Trees - Michael Skotar - Medium*. Medium; Medium. <https://medium.com/@michaelskotar/importance-of-binary-search-trees-d354afc6e347>