

Brief Data Structures Easy to Advanced

Before I start, I want to lay the foundation of some core concepts you will need throughout these course . Let's get started with the basics.

A data structure is a way of organizing data so that it can be used efficiently. Data structures are essential ingredients in creating fast and powerful algorithms.

Another reason might be that they help us manage and organize our data in a natural way. We need to have a quick look at the wild world of computational complexity to understand the performance that our data structures are providing.

The point here is that the abstract data type only defines how a data structure should behave, and what methods it should have. But not the details surrounding how those methods are implemented. Big O only cares about what happens when your input becomes arbitrarily large. **We ignore things like constants and multiplicative factors.**

- **Almost any mathematical expression containing n can be wrapped around a big O.**
- **If your algorithm case in logarithmic amount of time to finish, we say that 's big O of a log event. If it take like quadratic time or cubic time, then we say n raised to that power, it's exponential.**

Both of the following run in constant time with respect to the input size. And because they don't depend on n at all. So as our input size gets arbitrarily large, well , that loop is still going to run in the same amount of time regardless.

Now let 's look at perhaps a more complicated example:.

A classic algorithm of doing a binary search yields actually a logarithmic time complexity. So what this algorithm does is it starts by making two pointers, one at the very start in one at end of the array. Then it selects a midpoint between two and checks if the value we 're looking for was found at the midpoint. If it has found it or not, it discards one half of the. array , and adjusts either the high or low pointer. This is part one of two in the array videos. The reason the array is used so much is because it forms a fundamental building block for all other data structures. With arrays and pointers alone, I 'm pretty sure we can construct just about any data structure. So what is a static array is a fixed length container containing elements.