Lambda

Arrays

Arrays are a fundamental data structure. But how do they work? Why is it difficult to resize them and what's the reason that they need to have only elements of the same type?

We will take a deep dive into this data structure to gain a better understanding of how it functions. We'll talk about how memory is allocated for them and what happens when you append, pop, or otherwise add or remove a value inside.

We'll later use this knowledge, and combine it with what we have learned about linked lists, to build our own implementation of a simple hash table.

At the end of this module, you should be able to:

- implement and describe how high-level array functions work down to the memory level

Pro Tip

If you don't know the answer to a question someone asks you it's okay to say "I don't know but I'll find out and get back to you."

Prepare

Review each preclass resource before class.

Learn

Learn to implement and describe how high-level array functions work down to the memory level

Arrays are common in every programming language, yet their high-level implementations usually hide a lot of complexity that could cause massive performance costs if the developer is unaware. It's important to understand exactly what's going on with arrays and this lays the groundwork to talk about hash tables.

Overview

Arrays are the most common and perhaps the simplest data structures. Are they really so simple though? High-level languages like Python, JavaScript, Swift and Java all have built-in "magic" that hides the complexity of many array functions. Although the complexity is hidden, you still have to pay the performance costs of that complexity.

For this assignment, you will be implementing high-level array functionality from the ground up. You will construct methods from memory and pointers to create, destroy, read and write arrays. Then, you will write code to add and remove elements from your array. Sounds simple, right?

By the end of this assignment, you will gain much appreciation for the magic of high-level coding languages as well as a deeper understanding of the costs associated with their functionality.

Review

Class Recordings

You can use class recordings to help you master the material.

Arrays for CSPT4 with Tim Roy

Arrays for CSPT4 with Tim Roy

All previous recordings

Demonstrate Mastery

To demonstrate mastery of this module, you need to complete and pass a code review on each of the following: