Arrays and Lists

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Arrays:

- Arrays are a data structure that stores a collection of elements of the same data type.
- Elements in an array are stored in contiguous memory locations, allowing for efficient access.
- Arrays have a fixed size, meaning the number of elements it can hold is determined at the time of declaration.
- Elements in an array are accessed using an index, starting from 0 to the size of the array minus one.
- Common operations on arrays include inserting, updating, and deleting elements.

Lists:

- Lists are a data structure that stores a collection of elements, similar to arrays, but with dynamic sizing.
- Lists can grow or shrink in size as needed, making them more flexible than arrays.
- Elements in a list are linked together using pointers or references, allowing for non-contiguous memory storage.
- Common types of lists include linked lists, doubly linked lists, and circular linked lists.
- Lists can be implemented using various data structures, each with its own advantages and disadvantages.

Key Differences:

- Arrays have a fixed size, while lists are dynamic in size.
- Arrays store elements in contiguous memory locations, while lists use pointers for linking elements.
- Array elements are accessed using indices, whereas list elements are accessed by traversing the list.
- Arrays are more suitable for situations where the size of the collection is known in advance, while lists are more flexible for changing data sizes.

Conclusion: Arrays and lists are fundamental data structures used in programming to store collections of elements. Understanding the differences between arrays and lists is crucial for selecting the appropriate data structure based on the requirements of the program. Arrays are

efficient for fixed-size collections, while lists provide flexibility for dynamic data sizes. Both data structures have their own advantages and use cases in programming.