

Universidade Federal de Ouro Preto

Lecture Notes

Graph Representation

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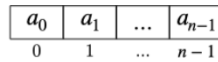
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Source

- Arrays <https://superstudy.guide/algorithms-data-structures/data-structures/arrays-strings>
- Stacks and Queues <https://superstudy.guide/algorithms-data-structures/data-structures/stacks-queues>

1 Arrays

An array is a collection of elements of the same data type that are stored together in contiguous memory locations and can be accessed using an index or a subscript.



1.1 Array operations

Type	Time	Description	Illustration
Access	O(1)	Using index i , we can directly access the i th element of the array with $A[i]$.	
Search	O(n)	We need to search the array by checking each element one by one until finding the desired value.	
Insertion	O(n)	1. Elements at indices i and up are moved to the right. 2. The new element is inserted at index i . <i>Note that if there is no space for the new element to be added in the existing array, we need to create a bigger array and copy existing elements over there.</i>	
Deletion	O(n)	1. Elements at indices $i+1$ and up are moved to the left. 2. The former last element of the array is either ignored or removed.	

2 Stacks (Pilha pt-BR)

A stack is an abstract data type that represents a collection of elements with a particular set of operations. It is based on the principle of Last-In-First-Out (LIFO), which means that the last element added to the stack is the first one to be removed.

3 Queues (Fila pt-BR)

A queue is an abstract data type that represents a collection of elements with a particular set of operations. It is based on the principle of First-In-First-Out (FIFO), which means that the first element added to the queue is the first one to be removed.