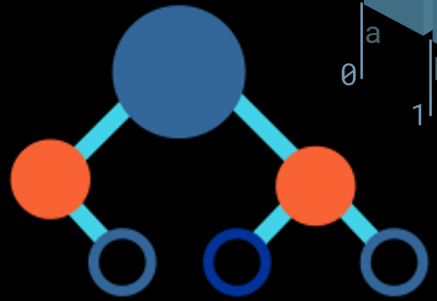
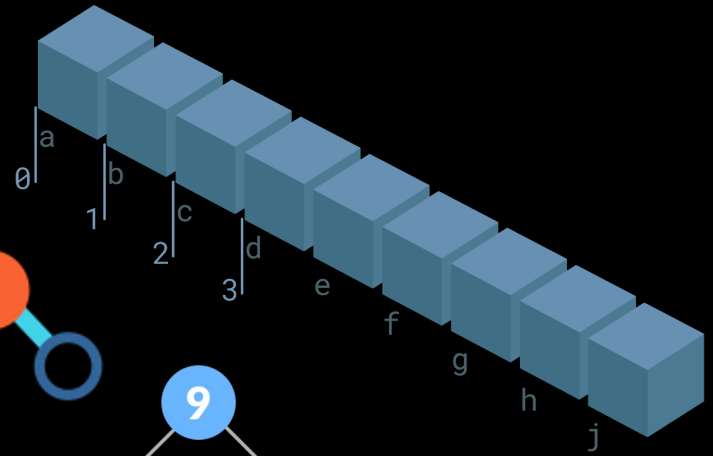
An Introduction to Data Structures

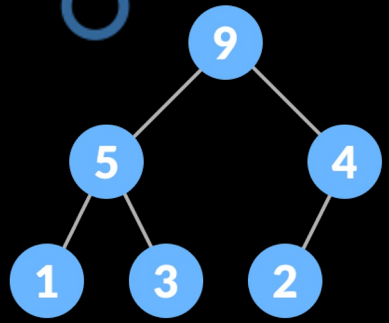
NullPointerException

Introduction

This Series



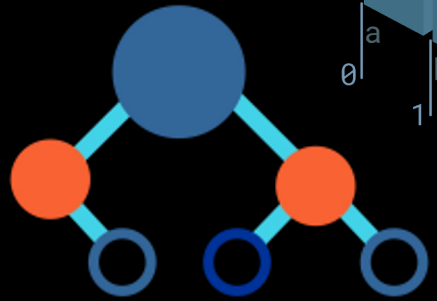


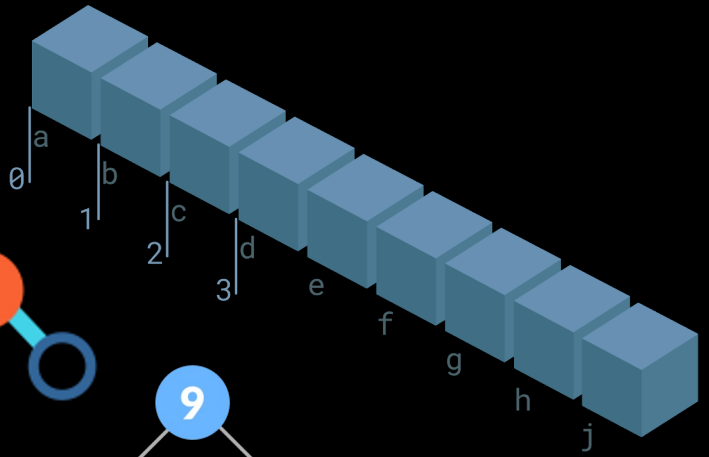


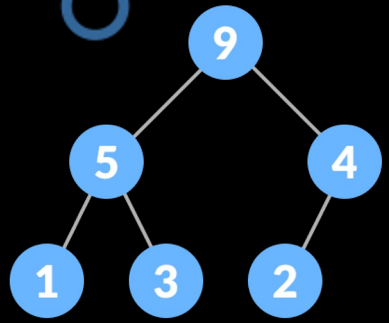
Introduction

This Series

What they are



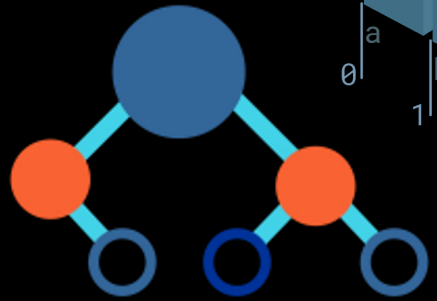


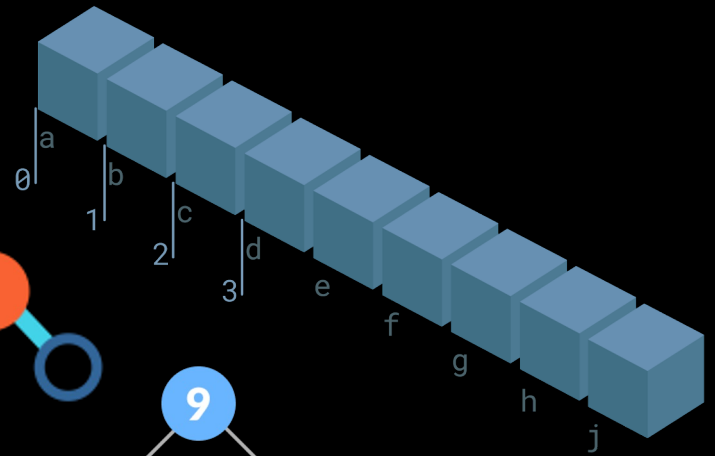


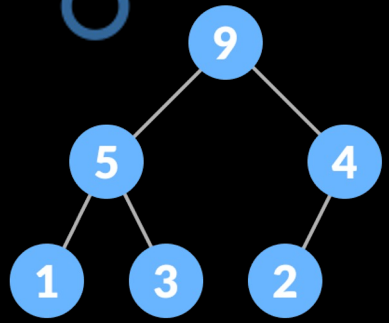
Introduction

This Series

- What they are
- The Different Types







Introduction

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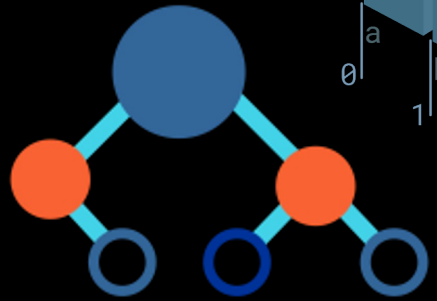
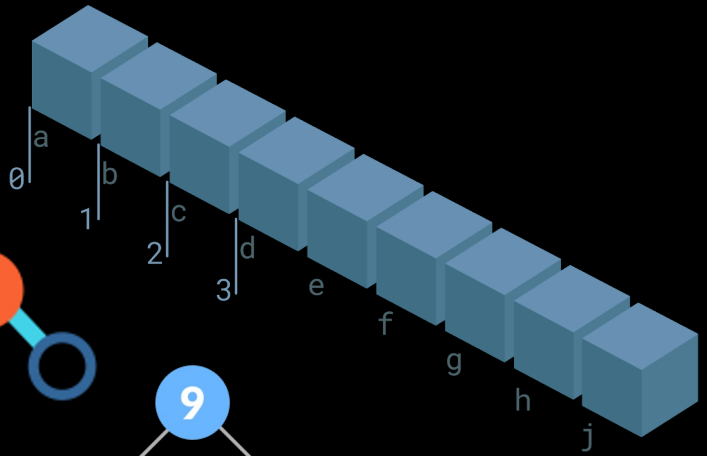
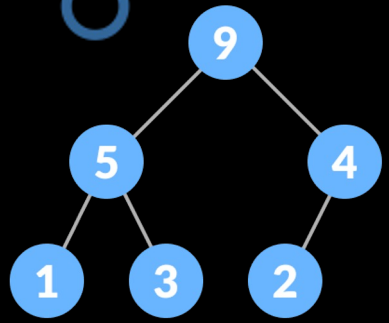
- What they are
- The Different Types
- How we can use them







Introduction

- This series will be a general overview of data structures
  - Won't be confined to one specific language
  - Will require a basic understanding of Computer Science

Introduction - What are Data Structures?

- A **Data Structure...**
  - A way to **store**, organize, and **manage** information (or data) in a way that allows you the programmer to easily **access** or **modify** the values within them

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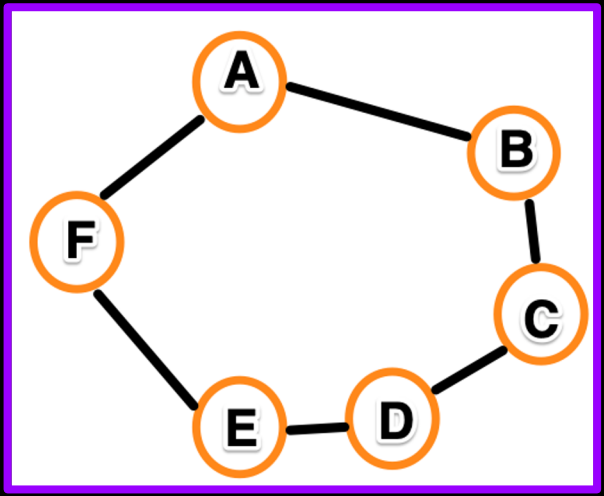

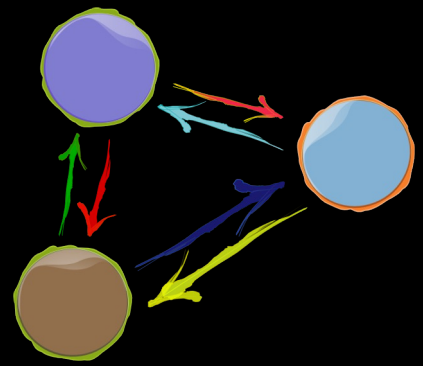

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Data Structures

Algorithms

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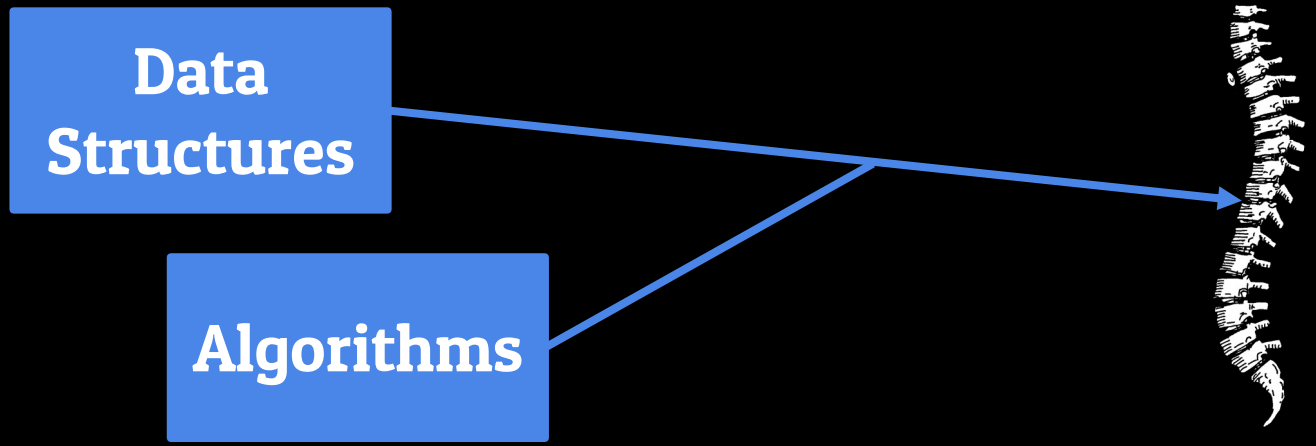

Introduction - What are Data Structures?

The GOAL of a data structure

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The GOAL of a data structure

Store Information

Introduction - What are Data Structures?

The GOAL of a data structure

Store Information

Access and Manipulate that Information

Introduction - What are Data Structures?

- If you have a basic understanding of programming, you probably know about a few Data Structures already
  - Arrays and ArrayLists

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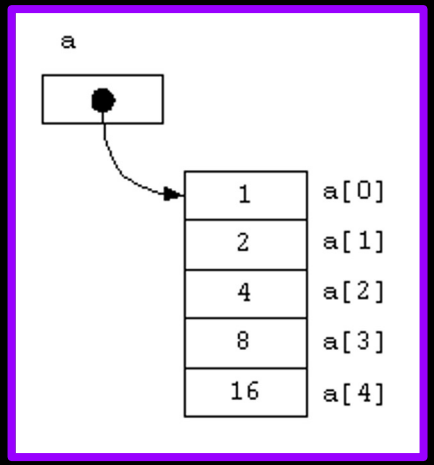

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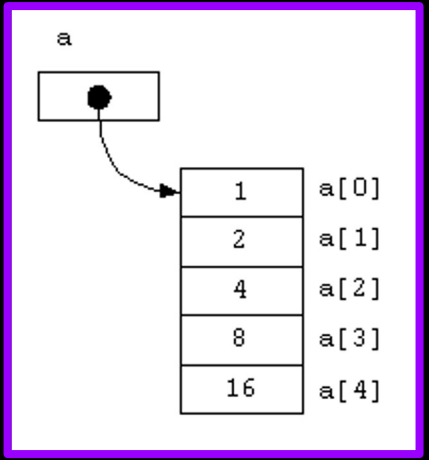

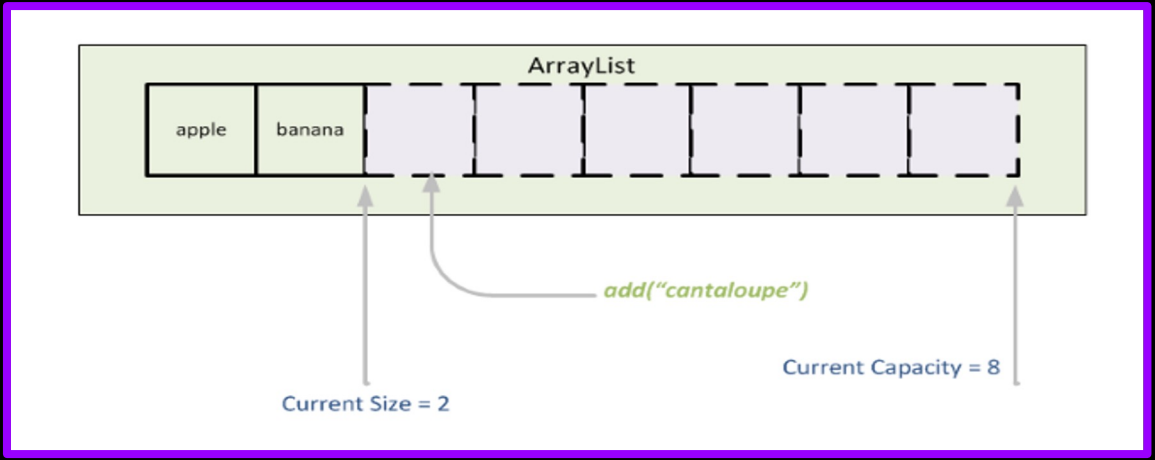

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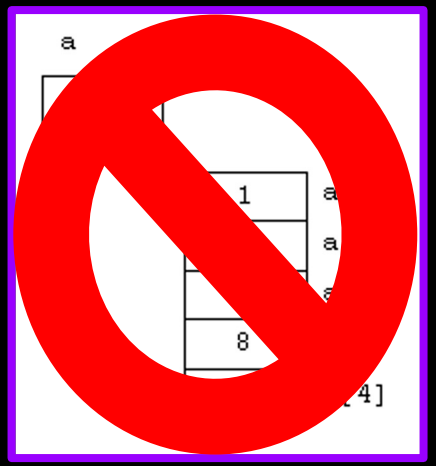

Introduction - What are Data Structures?

- **Basic Data Structures**
  - Password Databases
  - Online Directories
- **Advanced Data Structures**
  - Undo/Redo Function
  - Spell Check
  - Text Searching

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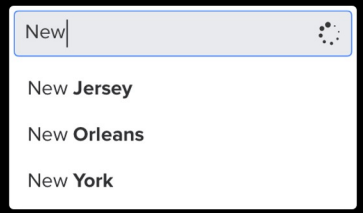
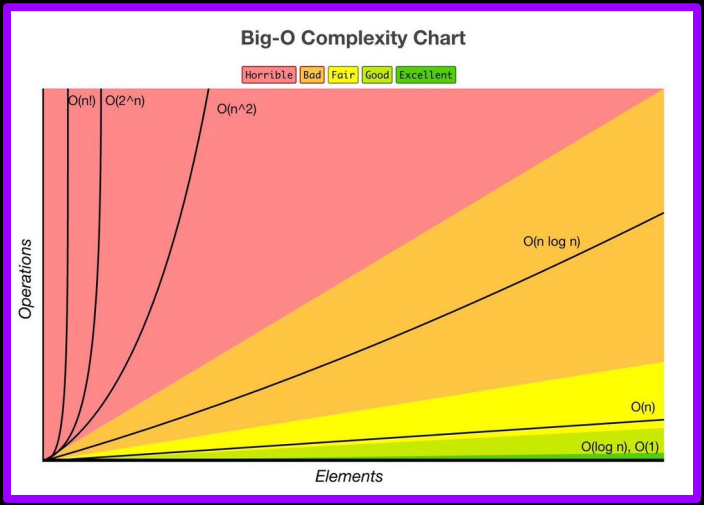


Introduction - Series Overview

- We'll Start with efficiency
  - The metrics used to judge the speed and efficiency of different data structures



Introduction - Series Overview

- The **Basics**
  - **Arrays** and **ArrayLists**

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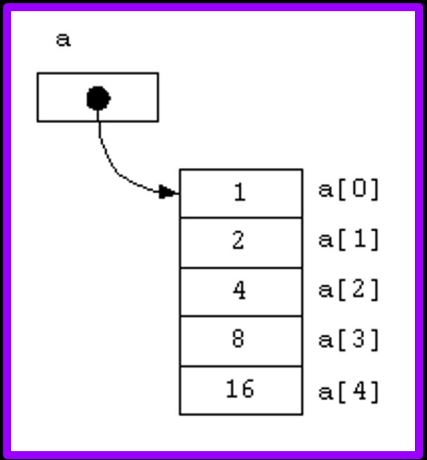

Arrays

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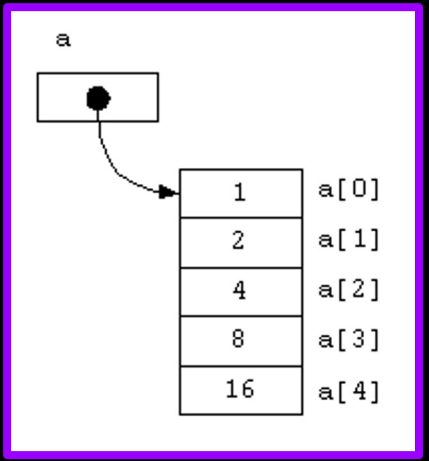
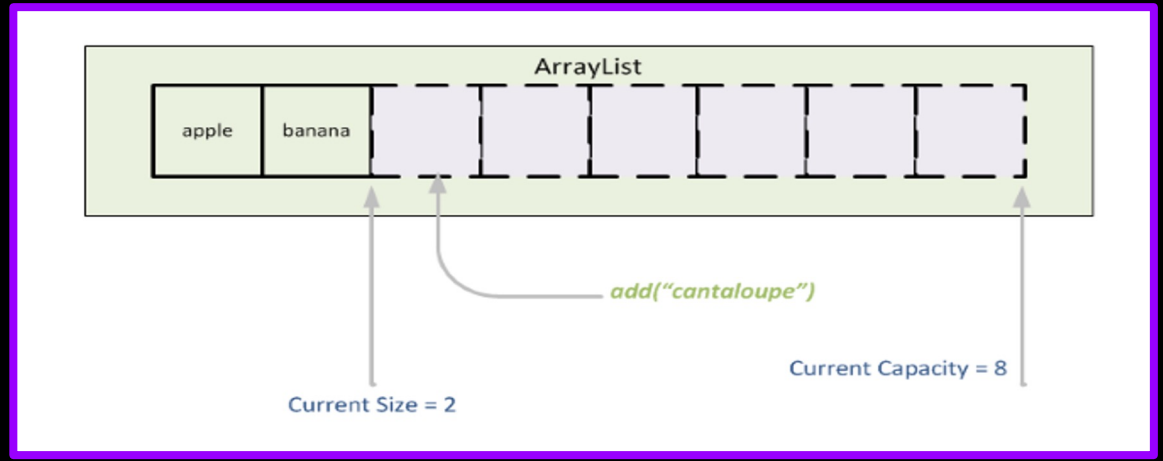


Arrays



ArrayLists

Introduction - Series Overview

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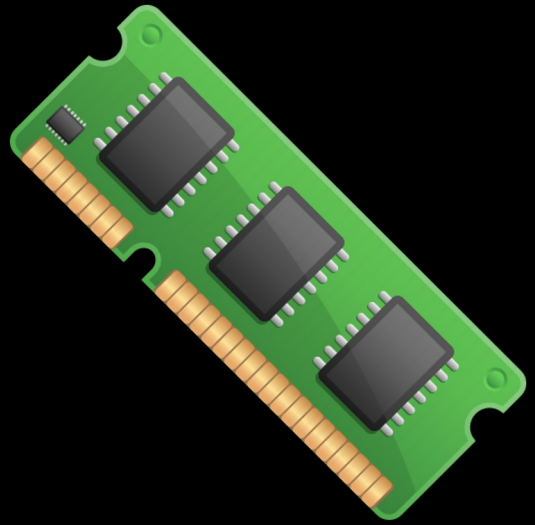

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  - Have **special attributes** which make them stand out

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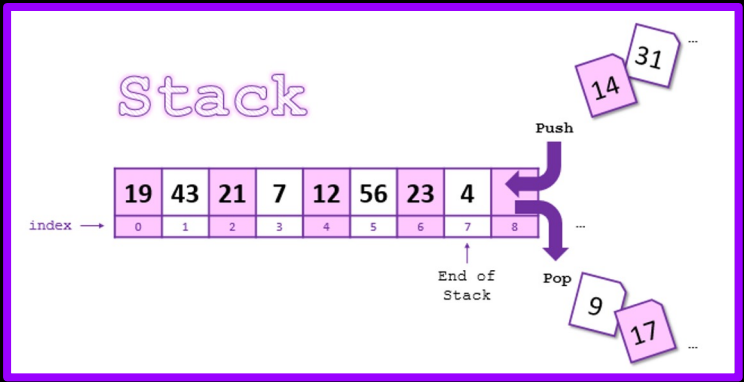

Stacks

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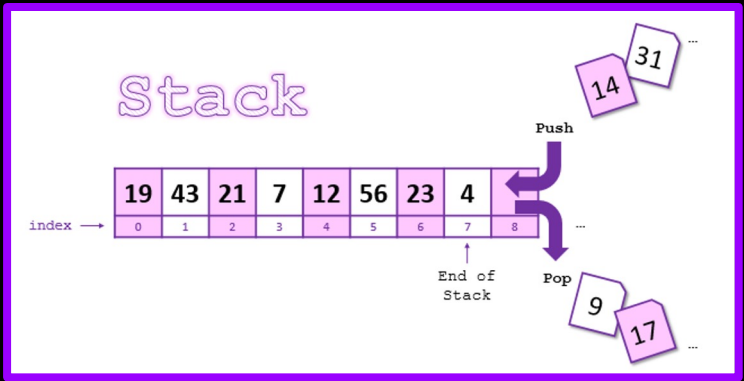
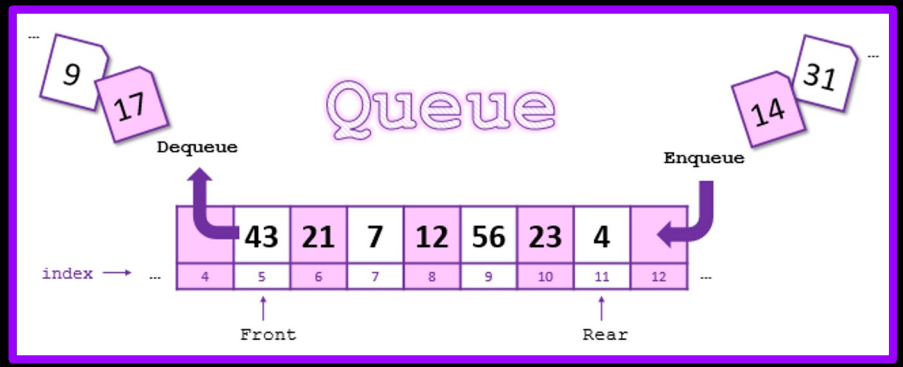


Stacks

Queues



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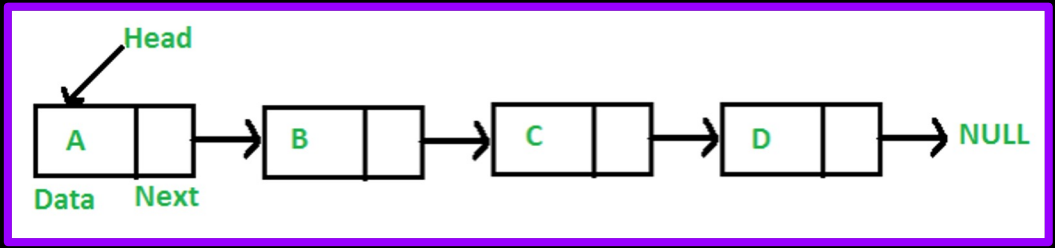

LinkedLists

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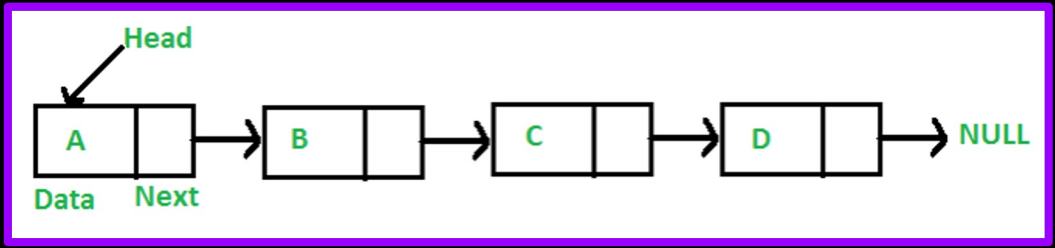
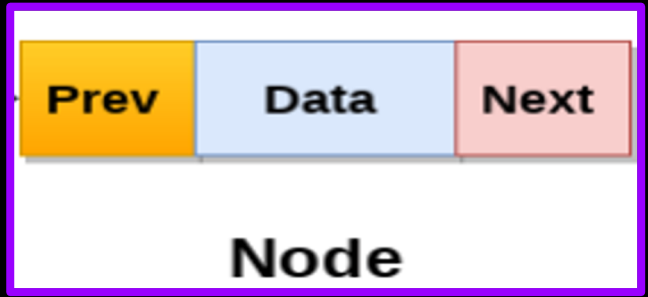


LinkedLists

Doubly-LinkedLists



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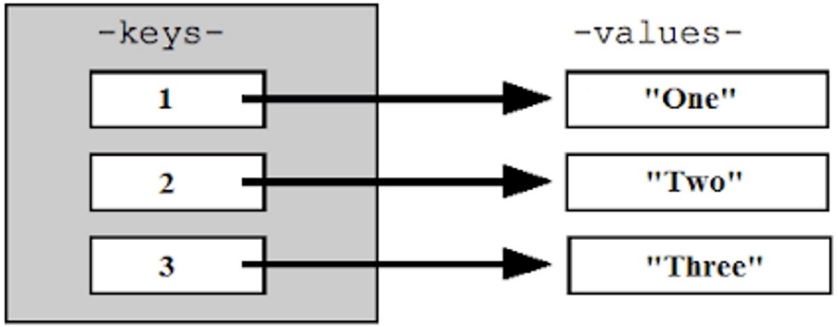

Dictionaries

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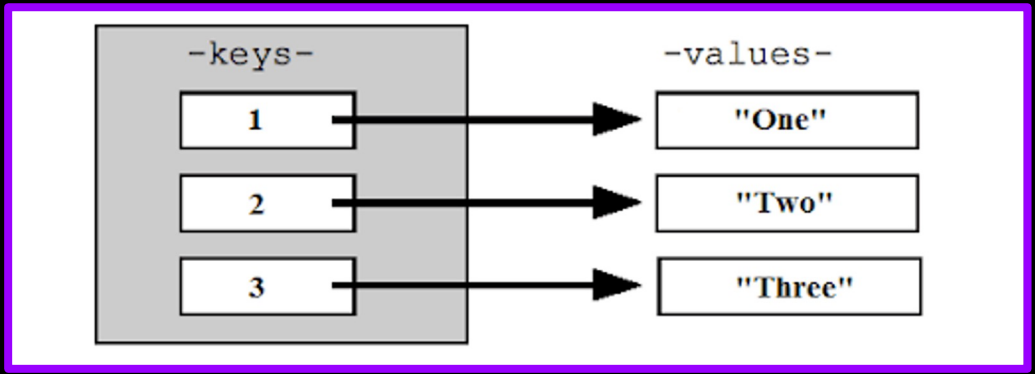

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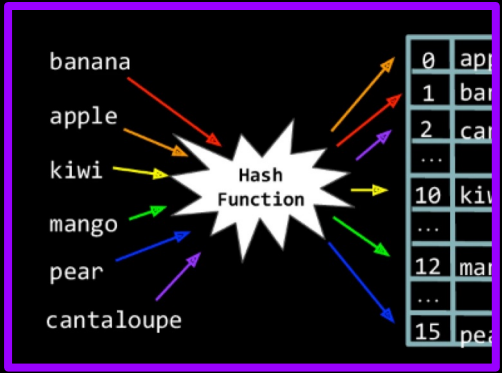

Hash-Tables

Introduction - Series Overview

- **Tree-Based Data Structures**
  - Less linear, more abstract

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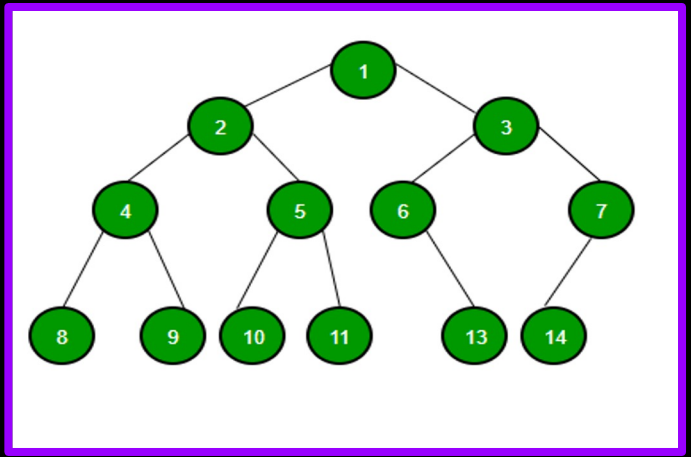

Trees

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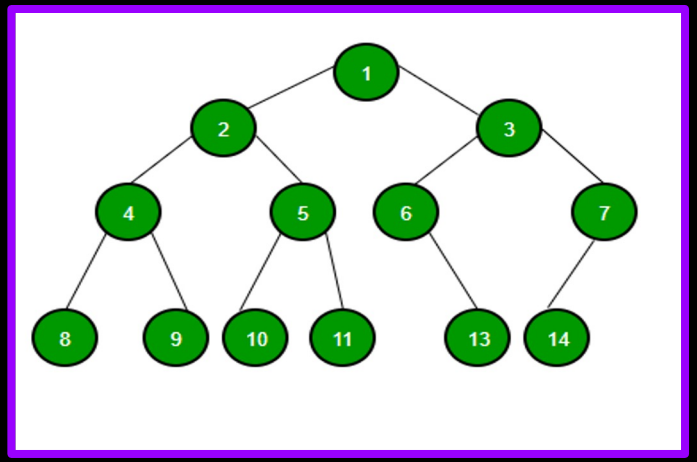

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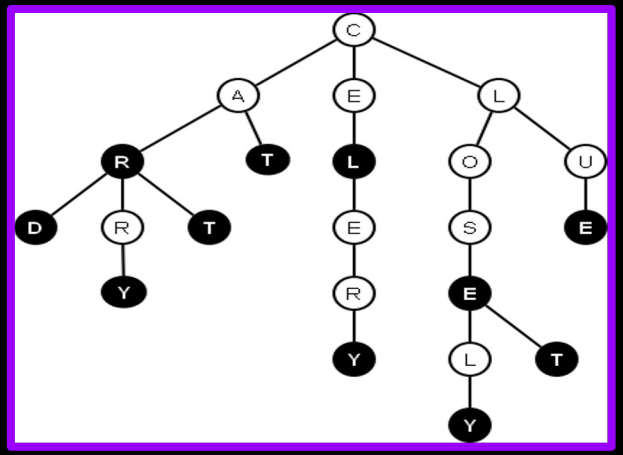

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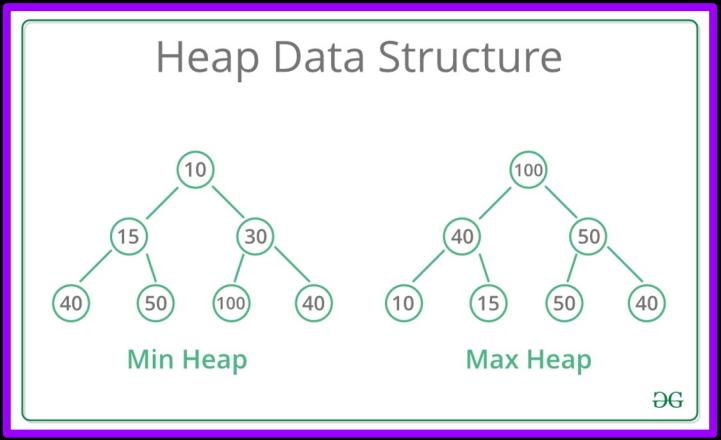

Heaps

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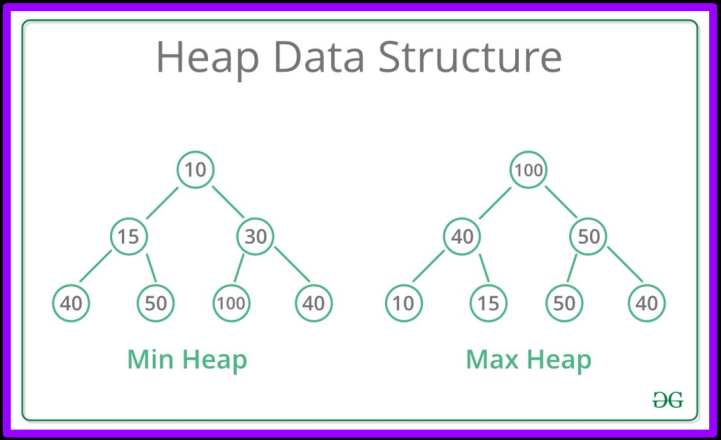
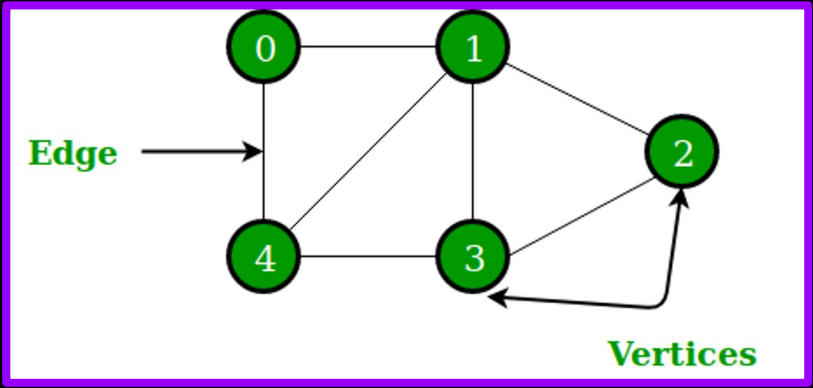


Heaps

Graphs



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Tree-based Data Structures