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**Collections**

The Java Collections Framework (JCF) is a unified architecture for representing and manipulating collections of objects in Java. It provides a set of interfaces, classes, and algorithms to store, manipulate, and retrieve groups of objects efficiently.

**The framework includes the following types:**

**List**:

Represents an ordered collection of elements where duplicates are allowed. Main implementations include ArrayList (dynamic array) and LinkedList (doubly linked list).

**Set:**

Represents a collection of unique elements where duplicates are not allowed. Common implementations include HashSet (hash table) and TreeSet (sorted tree).

**Map:**

Represents a collection of key-value pairs where each key is unique. Common implementations include HashMap (hash table) and TreeMap (sorted tree).

**Queue:**

Represents a collection of elements that follow the First-In-First-Out (FIFO) ordering. Common implementations include LinkedList and PriorityQueue.

They provide methods to add, remove, iterate over, and manipulate elements within them, making it easier to manage and organize data in Java programs.

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**Arrays vs. ArrayLists:**

Arrays are fixed-size, direct-access data structures, while ArrayLists offer dynamic resizing and additional functionalities in Java collections.

**HashSet vs. TreeSet:**

HashSet provides unordered, constant-time operations, whereas TreeSet maintains elements in sorted order with slightly slower performance due to sorting overhead.

**HashMap vs. Set:**

HashMap stores key-value pairs with constant-time performance, allowing duplicates for values but not for keys, while Set represents a collection of unique elements without associated values.

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**Generics:**

Generics in Java collections allow you to define classes and methods with type parameters. This enables you to create data structures that can hold any type of objects while providing type safety at compile time. By using generics, you can specify the type of elements a collection can contain, ensuring type correctness and eliminating the need for explicit type casting.

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