

# Java Fundamentals: Collections

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WHAT ARE COLLECTIONS AND WHY USE THEM?



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# Project & Array Problem

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# Introduction & Course Outline

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Implementing Data  
Structures Is Hard!



# Data Structures Are Diverse



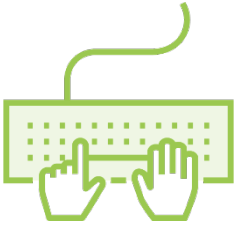
Ordering

Pairs

Uniqueness



# Course Outline



**Introduction to  
Collections**



**Lists: Collections with  
Iteration Order**



**Maps: Collections of Pairs**



**Java Streams**



**Collection Operations &  
Factories**



**Sets: Collection with  
Uniqueness**

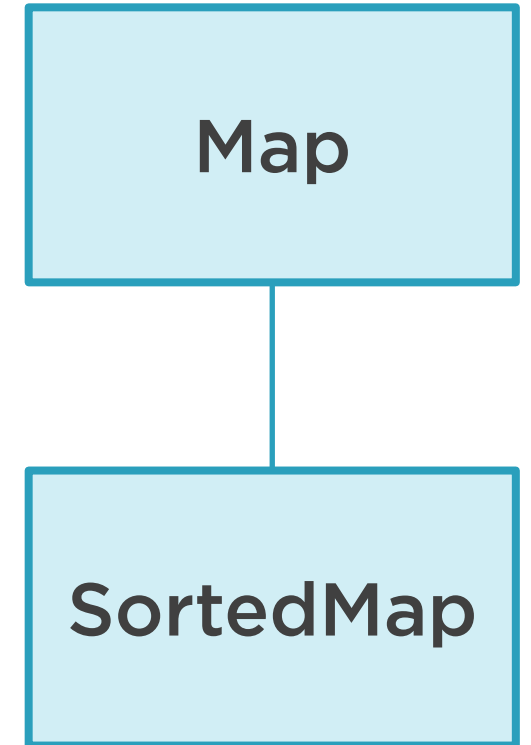
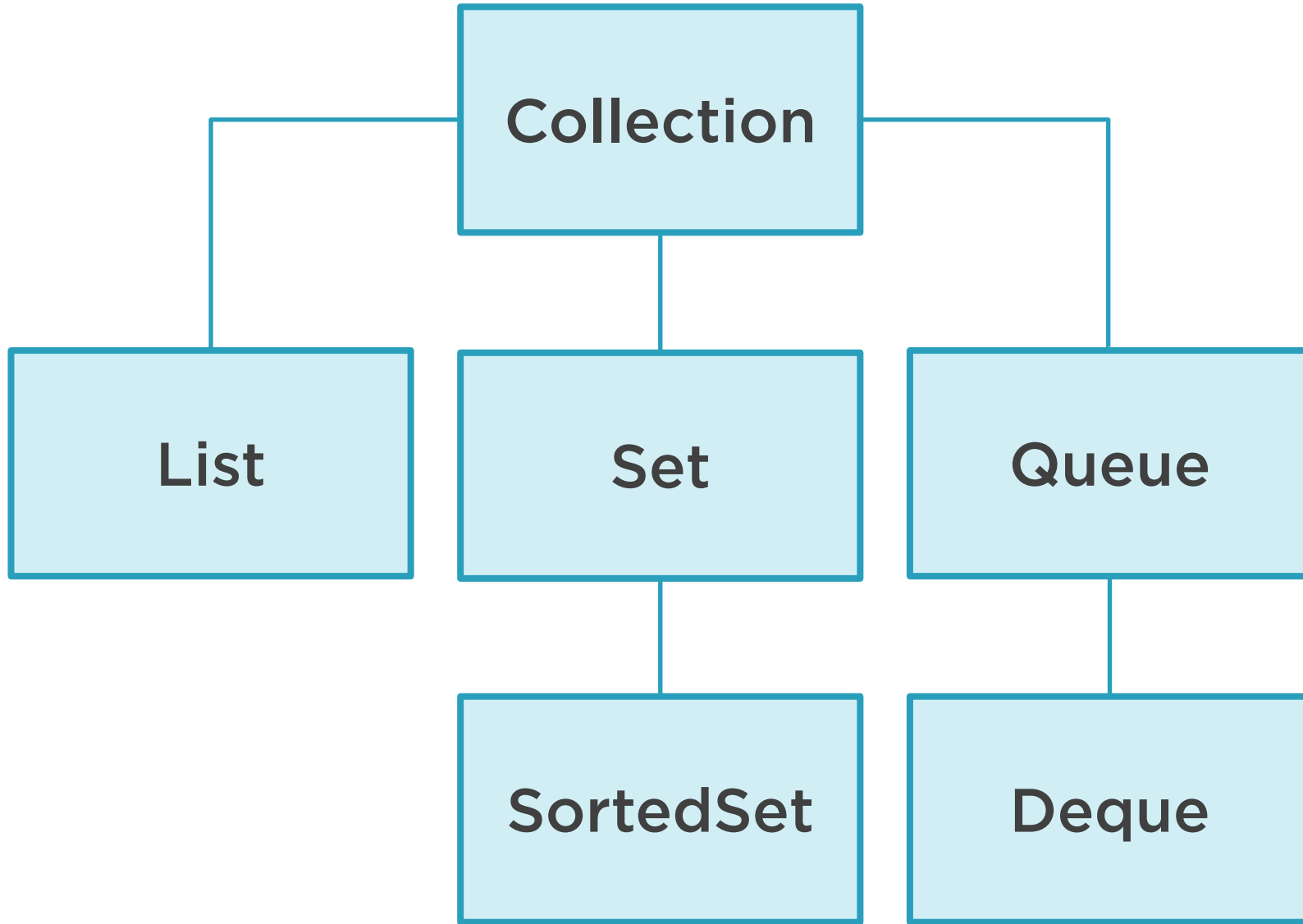


# Collection of Collections

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# Collection Design

## Interfaces

Multiple data structures

Functional characteristics

Prefer as variable type

Often has a popular implementation

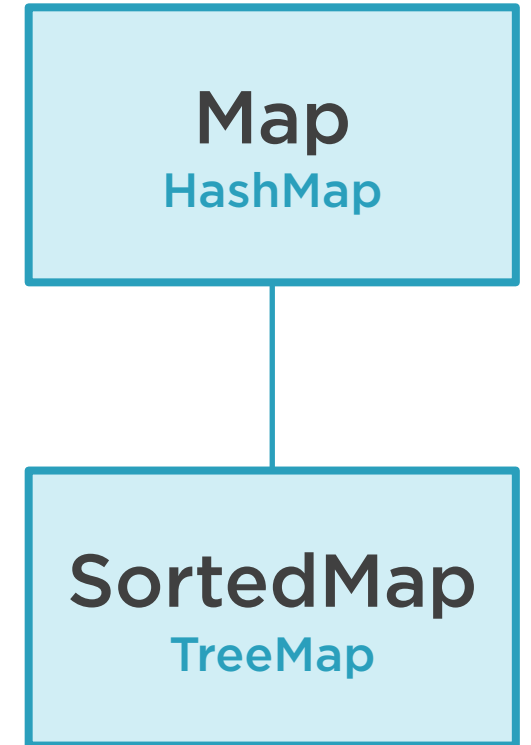
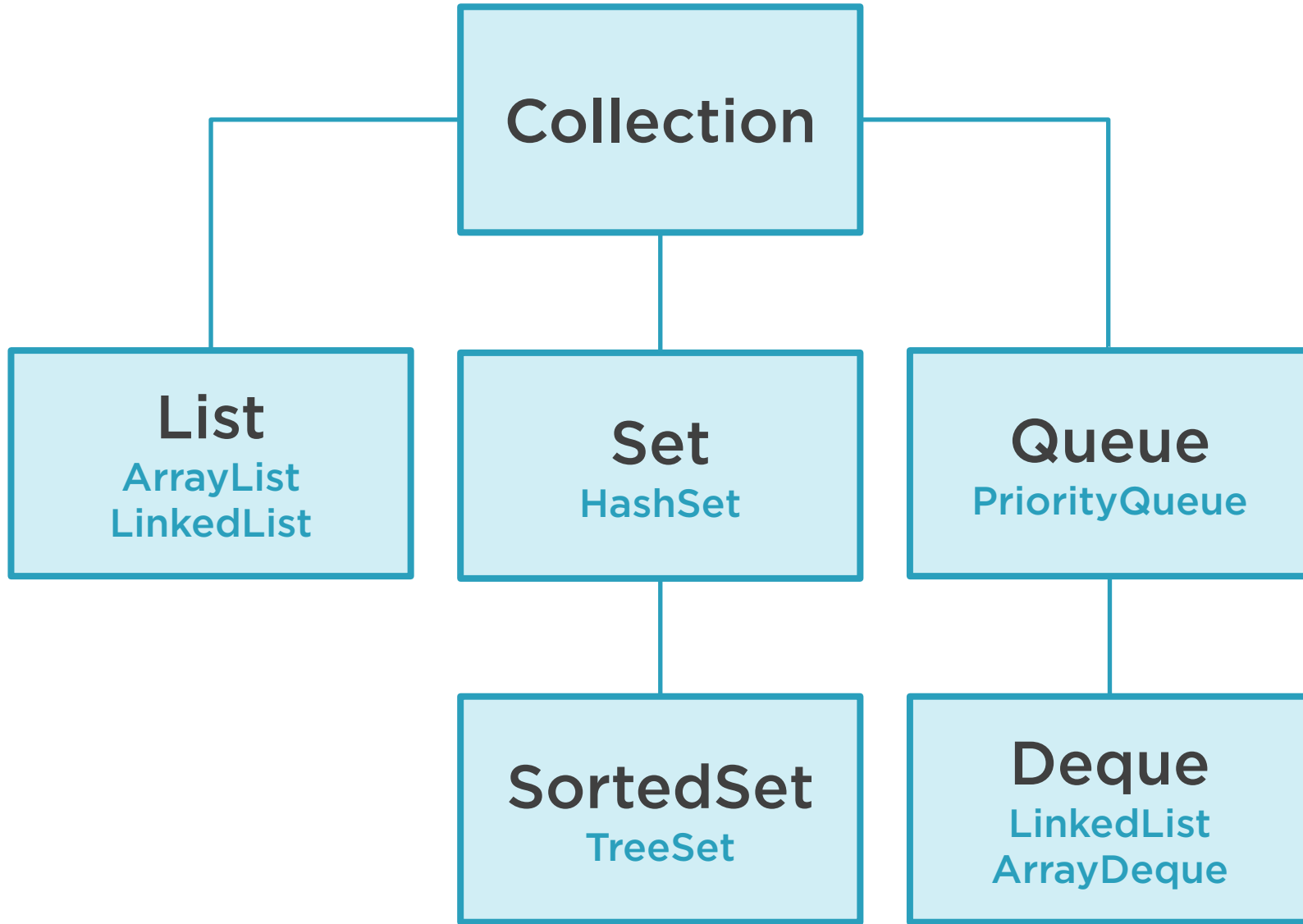
## Implementation

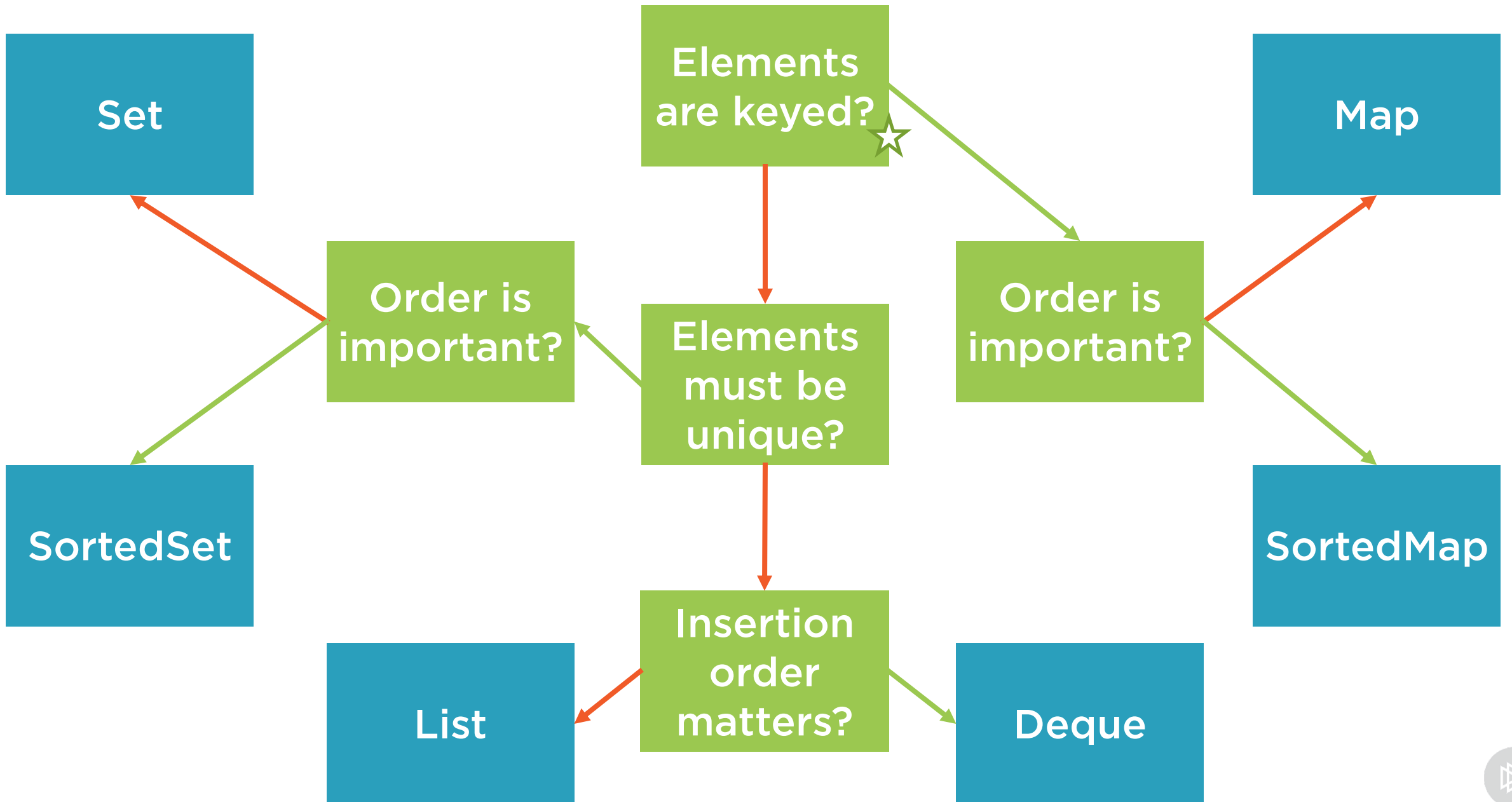
Specific data structures

Performance characteristics

Concrete and instantiable



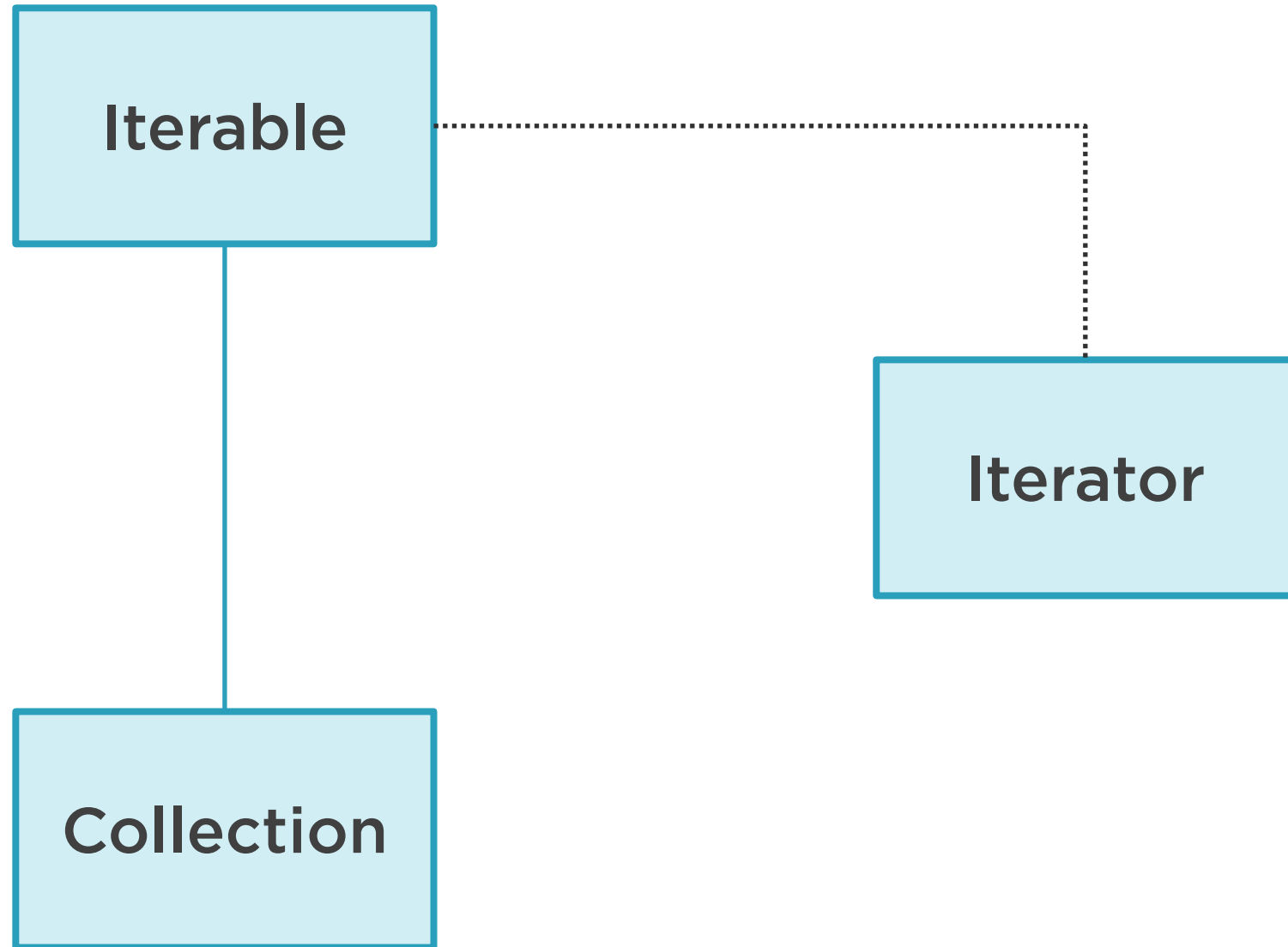




# Collection Behaviors

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`size()`

- ◀ Get the number of elements in the collection

`isEmpty()`

- ◀ True if `size() == 0`, false otherwise

`add()`

- ◀ Ensure that an element is in the collection

`addAll()`

- ◀ Add all the elements of the argument collection to this collection





`remove(element)`

`removeAll(collection)`

`retainAll(collection)`

- ◀ Remove the element from this collection
- ◀ Remove all the elements of the argument collection to this collection
- ◀ Remove all the elements of this collection not in the argument collection



```
contains(element)
```

```
containsAll(collection)
```

```
clear()
```

- ◀ True if the element is in this collection, false otherwise
- ◀ True if all the elements of the argument collection are in this collection
- ◀ Remove all elements from this collection



# Summary



Java Collections are useful and versatile

There's a collection of collections

When to use specific collections

Common collection features

