Java Completeable Futures: API Overview

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Learning Objectives in this Part of the Lesson

- Know how Java completable futures overcome limitations with Java futures
- Recognize how methods are grouped in the Java completable future API
Grouping the Java Completable Future API
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• The entire completable future framework resides in 1 public class with 60+ methods!!!
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- Implements the Façade pattern

See en.wikipedia.org/wiki/Facade_pattern
Grouping the Java Completable Future API

- The entire completable future framework resides in 1 public class with 60+ methods!!!
- Implements the Façade pattern
- It helps to have a “birds-eye” view of this method-intensive class

See en.wikipedia.org/wiki/Earthrise
Grouping the Java Completable Future API

- Some completable future features are basic

![Diagram showing categories of Completable Future API methods]

- Completion stage methods
- Factory methods
- Arbitrary-arity methods
- Exception methods
- Basic methods
Grouping the Java Completable Future API

- Some completable future features are basic
  - e.g., the Java Future API + some simple enhancements

Only slightly better than the conventional Future interface
Other completable future features are more advanced.
Grouping the Java Completable Future API

- Other completable future features are more advanced
- Factory methods

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Factory methods

- Initiate async two-way or one-way computations without using threads explicitly
Grouping the Java CompletableFuture API

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- Factory methods
  - Initiate async two-way or one-way computations without using threads explicitly

Help make programs more *elastic* by leveraging a pool of worker threads
Grouping the Java Completable Future API

- Other completable future features are more advanced
  - Factory methods
  - Completion stage methods
Grouping the Java Completable Future API

- Other completable future features are more advanced
  - Factory methods
  - Completion stage methods
    - Chain together actions that perform async result processing & composition

See docs.oracle.com/javase/8/docs/api/java/util/concurrent/CompletionStage.html
Grouping the Java Completable Future API

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Help make programs more responsive by not blocking user code.
Grouping the Java Completable Future API

- Other completable future features are more advanced
  - Factory methods
  - Completion stage methods
  - “Arbitrary-arity” methods

See [en.wikipedia.org/wiki/Arity](en.wikipedia.org/wiki/Arity)
Grouping the Java Completable Future API

- Other completable future features are more advanced
  - Factory methods
  - Completion stage methods
  - "Arbitrary-arity" methods
  - Process futures in bulk by combine multiple futures into a single future
Grouping the Java Completable Future API

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Help make programs more *responsive* by not blocking user code
Grouping the Java Completable Future API

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- Other completable future features are more advanced
  - Factory methods
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  - Handle exceptional conditions at runtime
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  - Handle exceptional conditions at runtime

Help make programs more resilient by handling erroneous computations gracefully
End of Java Completable Futures: API Overview