Programming with Java Futures

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Learning Objectives in this Part of the Lesson

- Motivate the need for Java futures by understanding the pros & cons of synchrony & asynchrony
- Know how Java futures provide the foundation for completable futures in Java
- Understand how to program with Java futures

```
String f1 = "62675744/15668936";
String f2 = "609136/913704";

Callable<BigFraction> call =
   () -> {
   BigFraction bf1 =
     new BigFraction(f1);
   BigFraction bf2 =
     new BigFraction(f2);
   return bf1.multiply(bf2); };

Future<BigFraction> future =
   commonPool().submit(call);
...
BigFraction res = future.get();
```

Programming with Java Futures

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- Example of using Java Future via a Callable & the common fork-join pool

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See github.com/douglascraigschmidt/LiveLessons/tree/master/Java8/ex8

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```

Callable is a two-way task that returns a result via a single method with no arguments

See docs.oracle.com/javase/8/docs/api/java/util/concurrent/Callable.html

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Java enables the initialization of a callable via a supplier lambda

See *"Overview of Java Lamba Expressions & Method References"*

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```

Can pass values to a callable via effectively final variables

See javarevisited.blogspot.com/2015/03/what-is-effectively-final-variable-of.html

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```

Submit a two-way task to run in a thread pool (in this case the common fork-join pool..)

See docs.oracle.com/javase/8/docs/api/java/util/concurrent/ForkJoinPool.html

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BigFraction result =
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```

submit() returns a future representing the pending results of the task

See docs.oracle.com/javase/8/docs/api/java/util/concurrent/Future.html

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BigFraction result =
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```

Other code can run here concurrently wrt the task running in the background

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Future<BigFraction> future =
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BigFraction result =
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```

get() blocks if necessary for the computation to complete & then retrieves its result

See docs.oracle.com/javase/8/docs/api/java/util/concurrent/Future.html#get

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   return bf1.multiply(bf2); };

Future<BigFraction> future =
   commonPool().submit(call);
...
BigFraction result =
   future.get(n, SECONDS);
```

get() can also perform polling & timed-blocks

See docs.oracle.com/javase/8/docs/api/java/util/concurrent/Future.html#get

End of Programming with Java Futures