Understand Java Streams Spliterators

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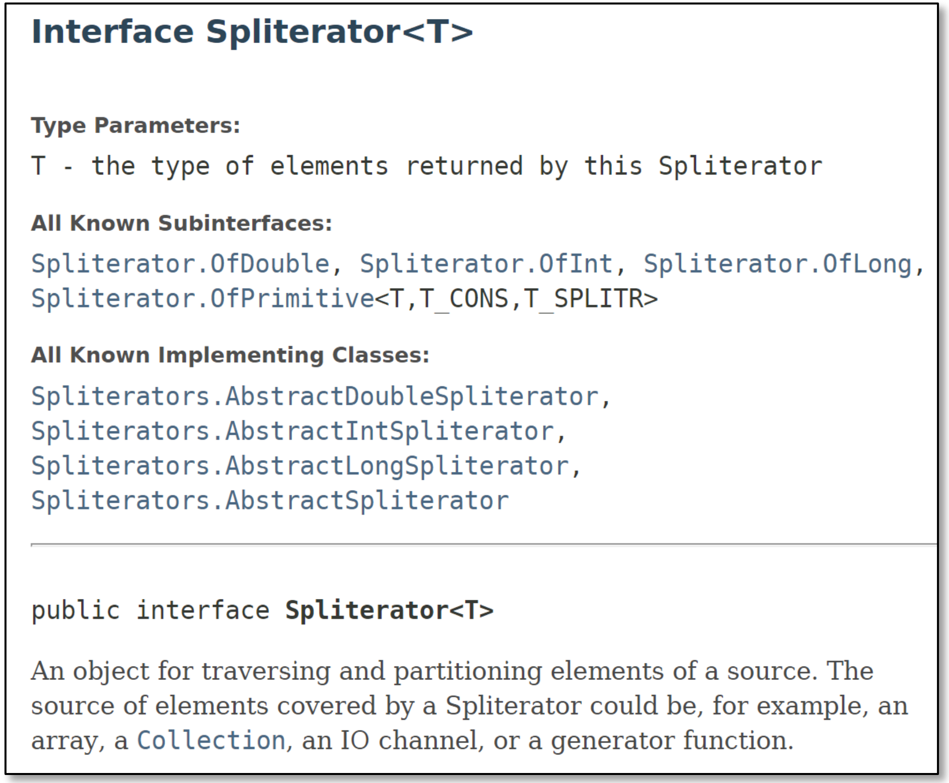
Learning Objectives in this Part of the Lesson

- Understand the structure & functionality of "Splittable iterators" (Spliterators)



Interface Spliterator<T>

Type Parameters:

`T` - the type of elements returned by this Spliterator

All Known Subinterfaces:

`Spliterator.OfDouble`, `Spliterator.OfInt`, `Spliterator.OfLong`, `Spliterator.OfPrimitive<T,T_CONS,T_SPLITR>`

All Known Implementing Classes:

`Spliterators.AbstractDoubleSpliterator`, `Spliterators.AbstractIntSpliterator`, `Spliterators.AbstractLongSpliterator`, `Spliterators.AbstractSpliterator`

```
public interface Spliterator<T>
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An object for traversing and partitioning elements of a source. The source of elements covered by a Spliterator could be, for example, an array, a `Collection`, an IO channel, or a generator function.

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

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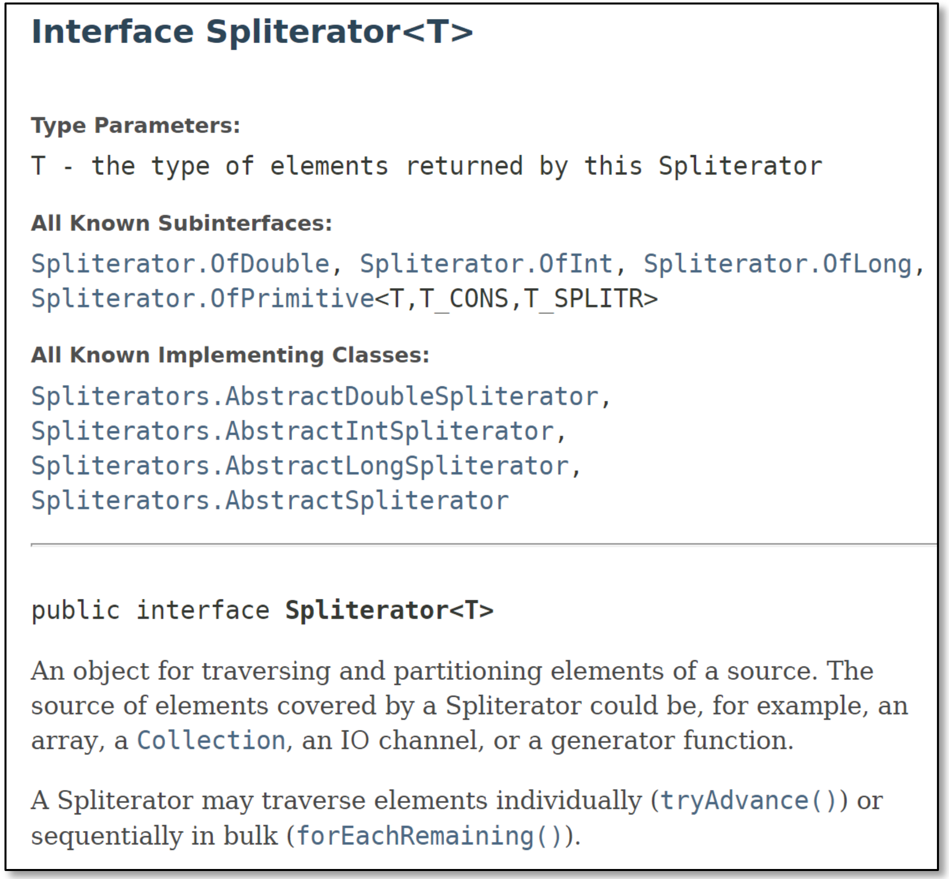

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A Spliterator may traverse elements individually (`tryAdvance()`) or sequentially in bulk (`forEachRemaining()`).

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- A Spliterator is a new type of "splittable iterator" in Java 8+
  - *Iterator* – It can be used to traverse elements of a source

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List<String> quote = List.of
    ("This ", "above ", "all- ",
     "to ", "thine ", "own ",
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     ...);

for (Spliterator<String> s =
         quote.spliterator();
     s.tryAdvance(System.out::print)
         != false;
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This source is an array/list of strings

See github.com/douglascraigschmidt/LiveLessons/tree/master/Java8/ex13

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Create a spliterator for the entire array/list

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tryAdvance() combines the hasNext() & next() methods of Iterator

See docs.oracle.com/javase/8/docs/api/java/util/Spliterator.html#tryAdvance

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```
boolean tryAdvance(Consumer
          <? super T> action) {
  if (noMoreElementsRemain)
    return false;
  else { ...
    action.accept
              (nextElement);
    return true;
  }
```

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Print value of each string in the quote

Overview of the Java Spliterator

- A Spliterator is a new type of "splittable iterator" in Java 8+
  - *Iterator* – It can be used to traverse elements of a source
  - *Split* – It can also partition all elements of a source

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List<String> quote = List.of
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Spliterator<String> secondHalf =
                    quote.spliterator();
Spliterator<String> firstHalf =
                    secondHalf.trySplit();

firstHalf.forEachRemaining
                (System.out::print);
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trySplit() returns a spliterator covering elements that will no longer be covered by the invoking spliterator

See docs.oracle.com/javase/8/docs/api/java/util/Spliterator.html#trySplit

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Spliterator<T> trySplit() {
  if (input <= minimum size)
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  else {
    split input in 2 chunks
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$\emptyset$

trySplit() calls itself recursively until all chunks are <= to the minimize size

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Ideally, a spliterator efficiently splits the original input source in half!

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The "right chunk" is defined by updating the state of **`this`** spliterator object

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The "left chunk" is defined by creating/returning a new spliterator object

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Performs the action for each element in the spliterator

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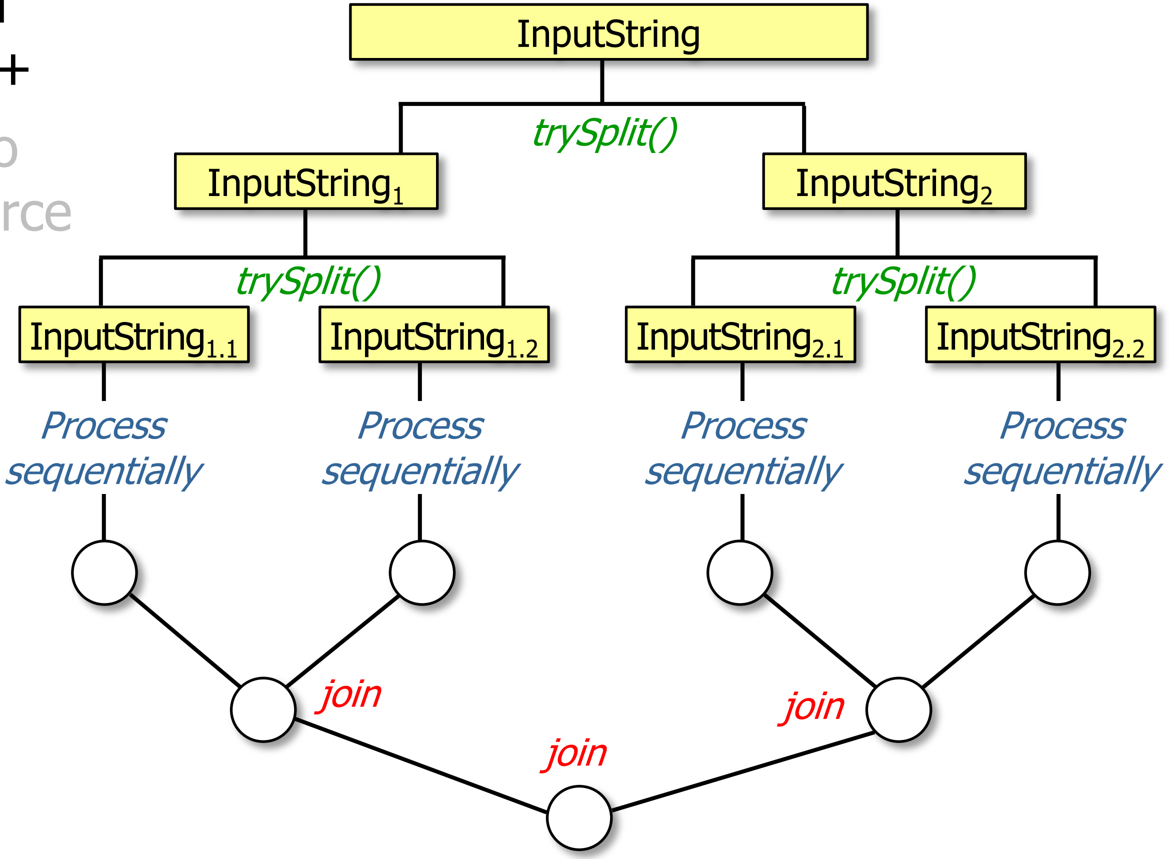
    - Mostly used with Java parallel streams



See blog.logentries.com/2015/10/java-8-introduction-to-parallelism-and-spliterator

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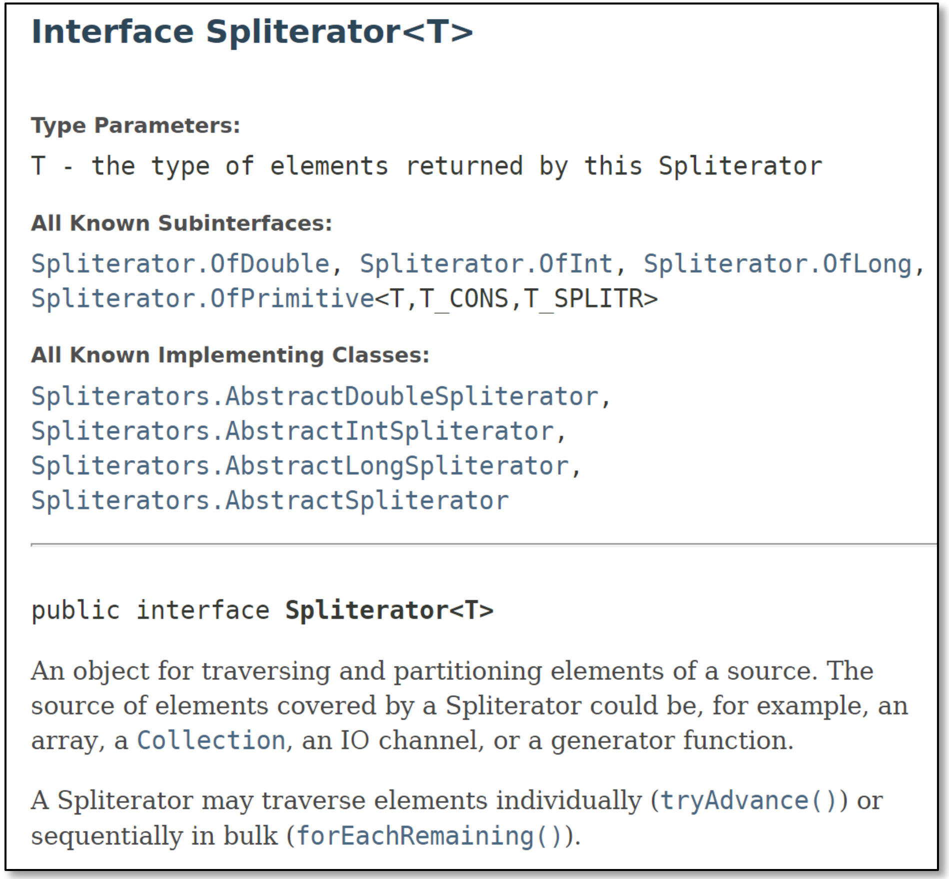

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We focus on traversal now & on partitioning later when covering parallel streams

End of Understand Java Streams Spliterators