Java Sequential SearchStreamGang Example: Applying Spliterator (Part 1)

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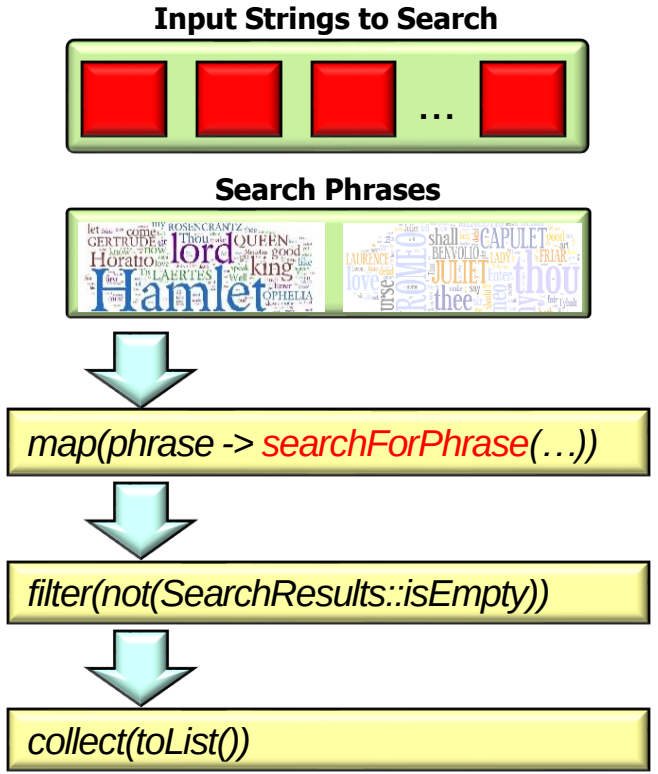
Learning Objectives in this Part of the Lesson

- Know how to apply sequential streams to the SearchStreamGang program
- Recognize how a Spliterator is used in SearchWithSequentialStreams

```
SearchResults searchForPhrase
   (String phrase, CharSequence input,
    String title, boolean parallel) {
   return new SearchResults
     (..., phrase, ..., StreamSupport
       .stream(new PhraseMatchSpliterator
                          (input, phrase),
               parallel)
       .collect(toList()));
}
```



Applying Java Spliterator in SearchStreamGang

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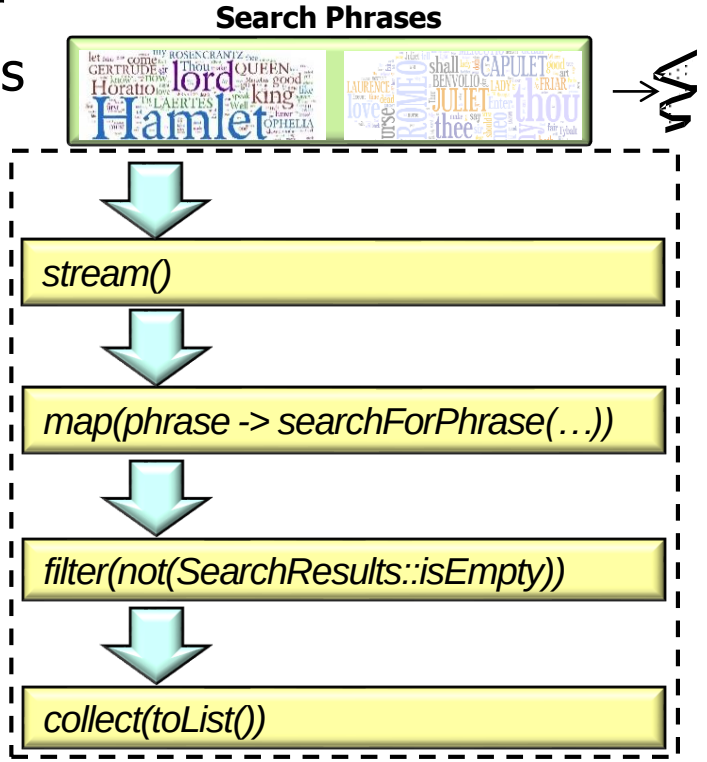
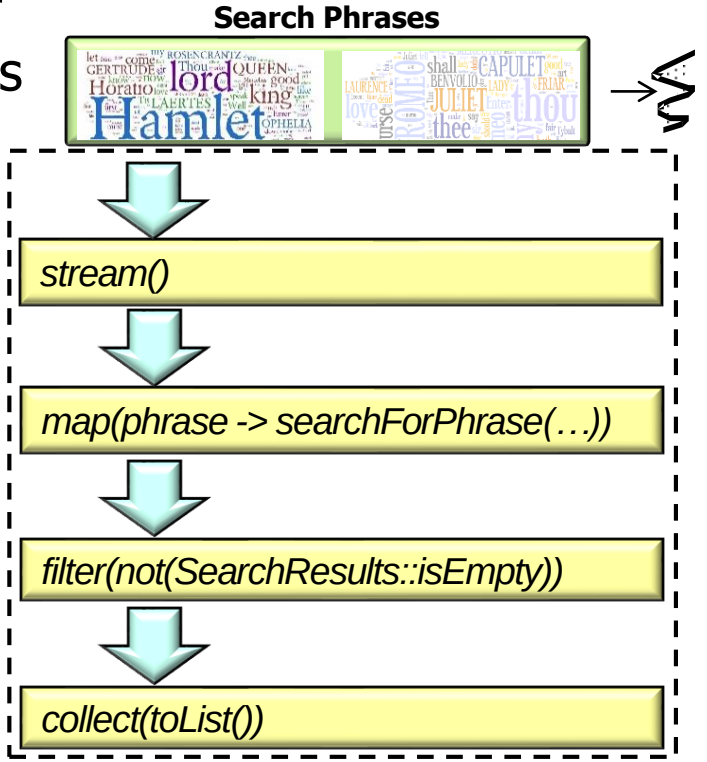
- SearchStreamGang uses PhraseMatchSpliterator that works for both sequential & parallel streams



See github.com/douglascraigschmidt/LiveLessons/tree/master/SearchStreamGang

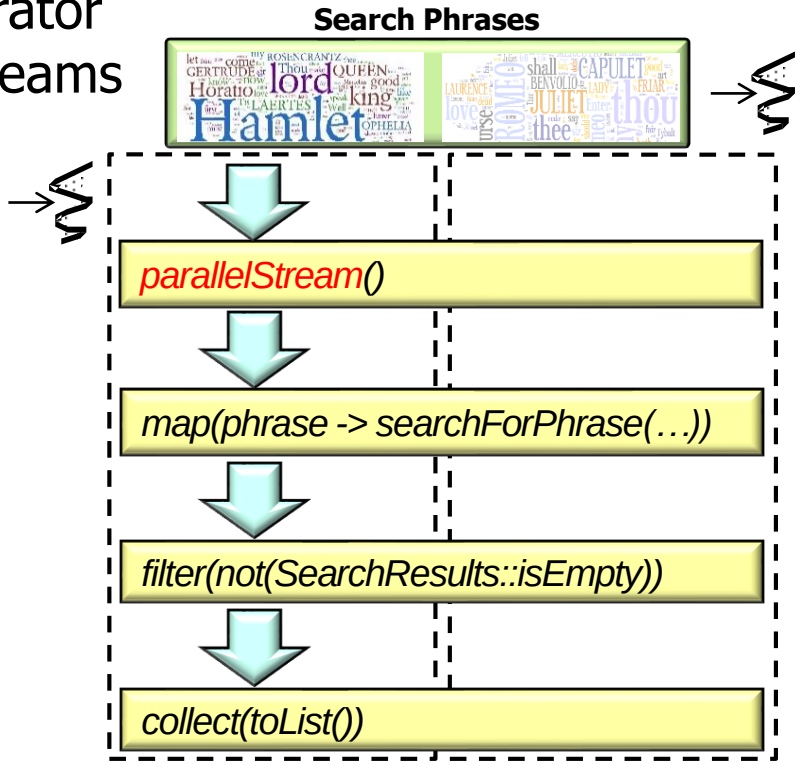
Applying Java Spliterator in SearchStreamGang

- SearchStreamGang uses PhraseMatchSpliterator that works for both sequential & parallel streams
  - We focus on the sequential portions now



Applying Java Spliterator in SearchStreamGang

- SearchStreamGang uses PhraseMatchSpliterator that works for both sequential & parallel streams
  - We focus on the sequential portions now
  - We'll cover the parallel portions later

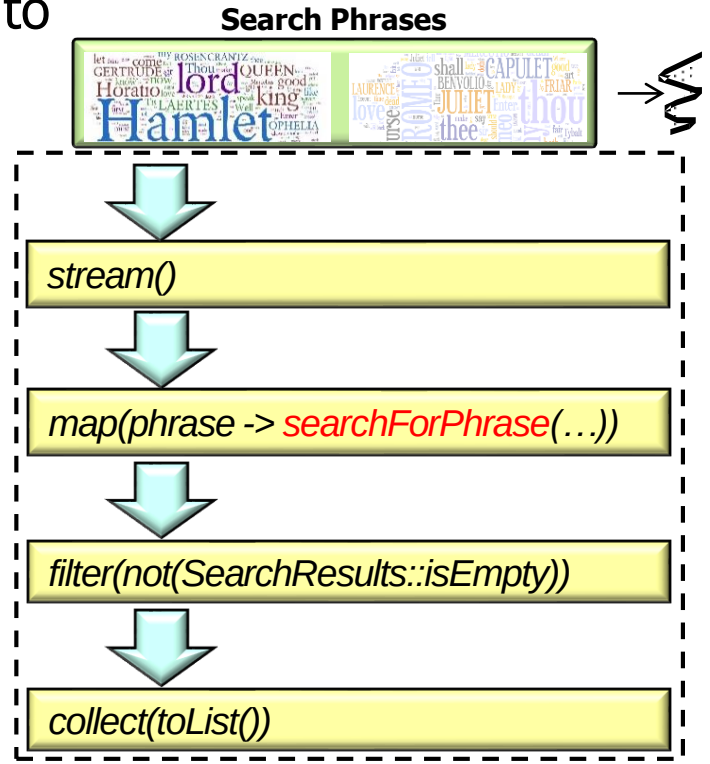


See *"Java 8 Parallel SearchStreamGang Example (Part 2)"*

Applying Java Spliterator in SearchStreamGang

- searchForPhrase() uses PhraseMatchSpliterator to find all phrases in input & return SearchResults

```
SearchResults searchForPhrase
   (String phrase, CharSequence input,
    String title, boolean parallel) {
   return new SearchResults
     (..., phrase, ..., StreamSupport
       .stream(new PhraseMatchSpliterator
                          (mInput, word),
               parallel)
       .collect(toList()));
}
```



See SearchStreamGang/src/main/java/livelessons/streamgangs/SearchStreamGang.java

Applying Java Spliterator in SearchStreamGang

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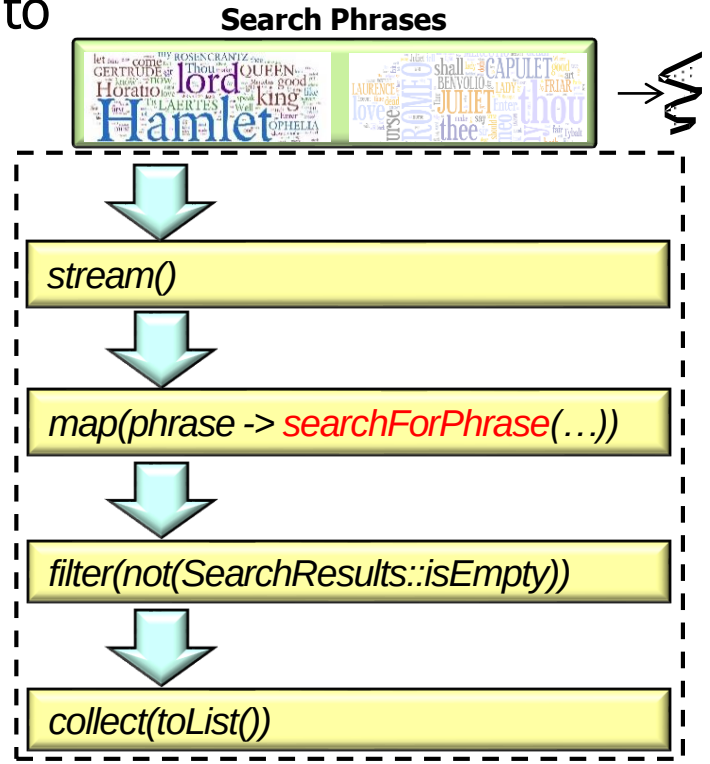
```

StreamSupport.stream() creates a sequential or parallel stream via PhraseMatchSpliterator



See docs.oracle.com/javase/8/docs/api/java/util/stream/StreamSupport.html#stream

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```
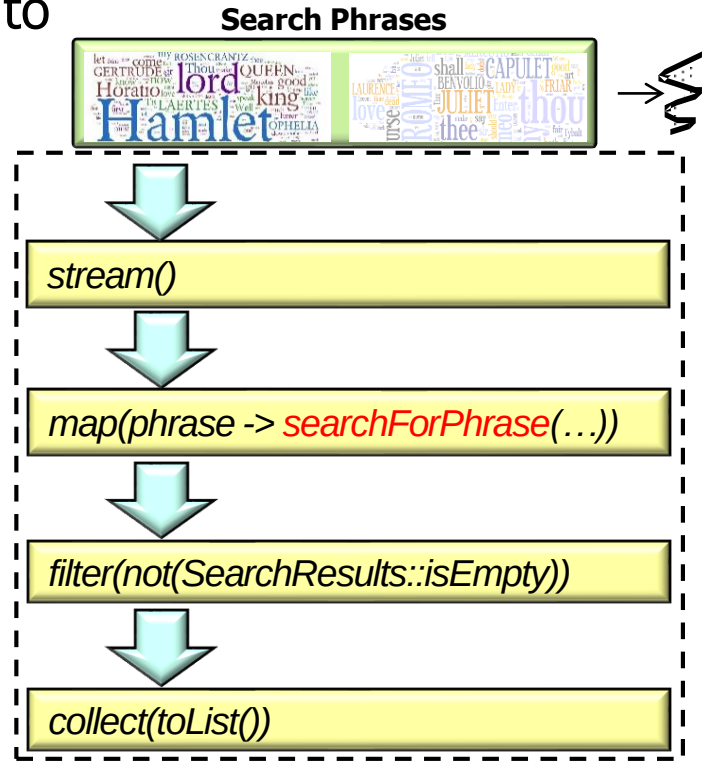

For SearchWithSequentialStreams "parallel" is false, so we'll use a sequential spliterator



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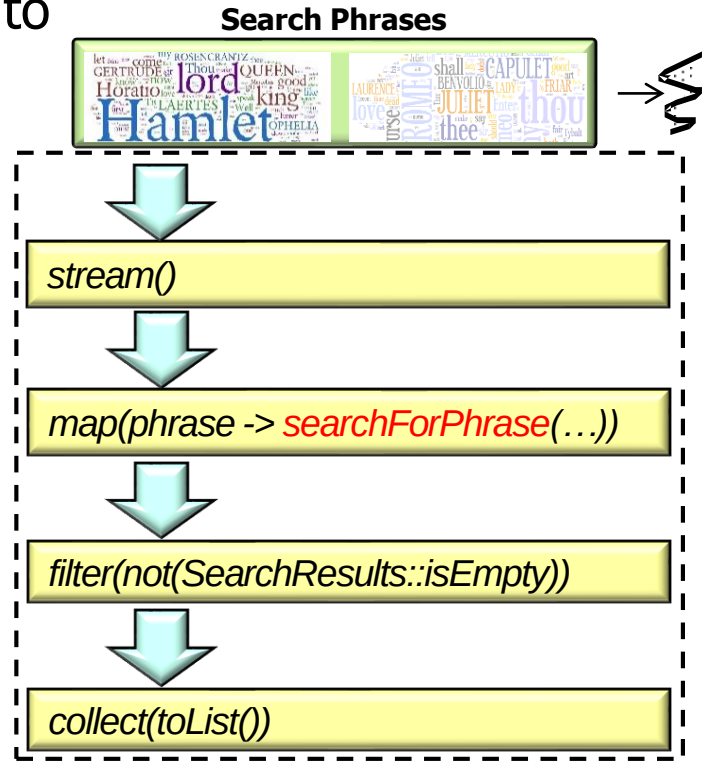
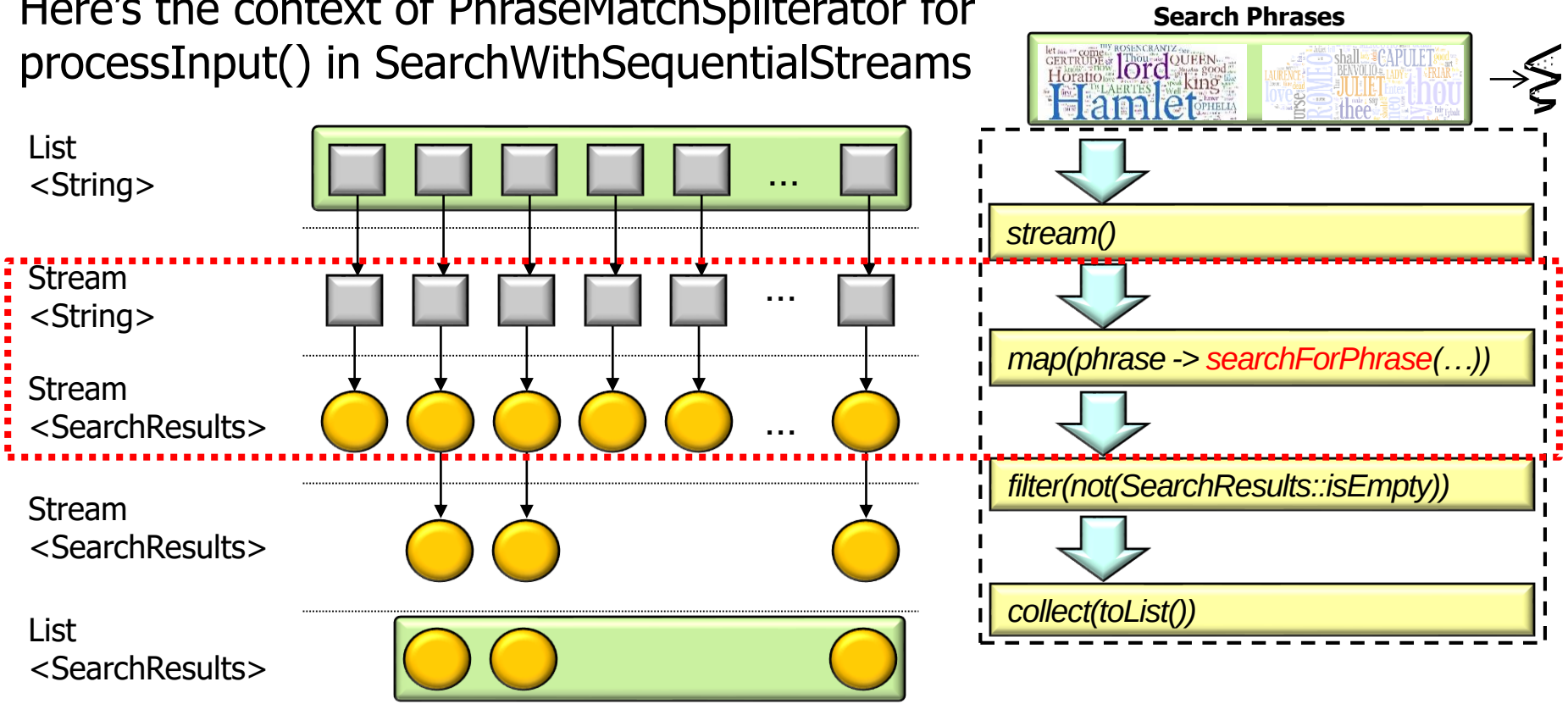
Convert the stream into a list of Request objects



Applying Java Spliterator in SearchStreamGang

- Here's the context of PhraseMatchSpliterator for processInput() in SearchWithSequentialStreams

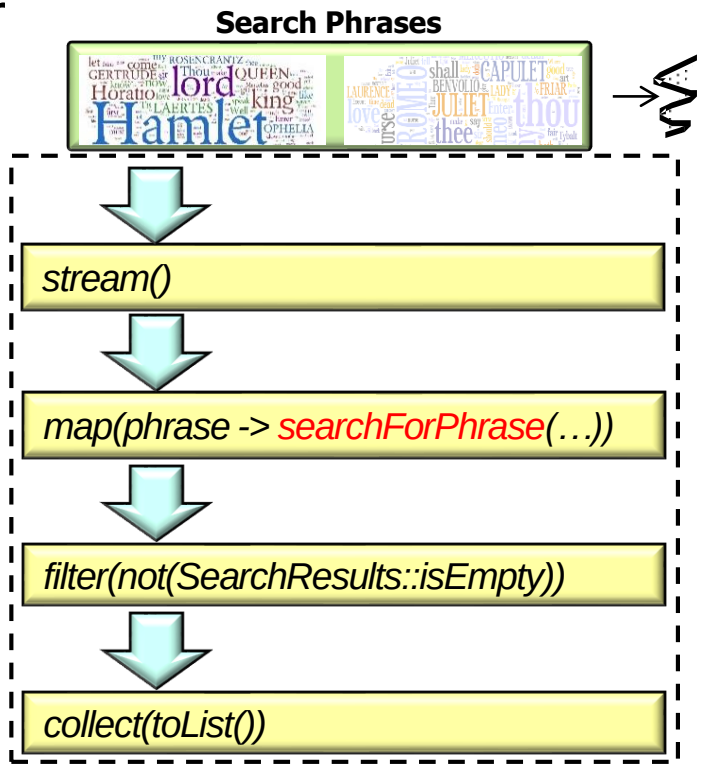


Applying Java Spliterator in SearchStreamGang

- Here's the context of PhraseMatchSpliterator for processInput() in SearchWithSequentialStreams

"…
My liege, and madam, to expostulate
What majesty should be, what duty is,
Why day is day, night is night, and time is time.
Were nothing but to waste night, day, and time.
Therefore, since brevity is the soul of wit,
And tediousness the limbs and outward flourishes,
I will be brief. …"

"Brevity is the soul of wit" matches at index [54739]



Applying Java Spliterator in SearchStreamGang

- PhraseMatchSpliterator uses Java regex to create a stream of SearchResults Result objects that match the # of times a phrase appears in an input string

```
class PhraseMatchSpliterator implements Spliterator<Result> {
  private CharSequence mInput;

  private final String mPhrase;

  private final Pattern mPattern;

  private Matcher mPhraseMatcher;

  private final int mMinSplitSize;

  private int mOffset = 0;
  ...
```

See SearchStreamGang/src/main/java/livelessons/utils/PhraseMatchSpliterator.java

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Spliterator is an interface that defines eight methods, including tryAdvance() & trySplit()

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

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```

These fields implement PhraseMatchSpliterator for both of the sequential & parallel use-cases

Some fields are updated in the trySplit() method, which is why they aren't final

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```

Contains a single work of Shakespeare

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```

Contains the phrase to search for in the work

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  private Matcher mPhraseMatcher;

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  ...
```

Contains the regular expression representation of the phrase

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

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```

Contains a matcher that searches for the phrase in the input

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

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Dictates the minimum size to perform a split

This field is used by the parallel streams spliterator

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  ...
```

Track the offset needed to return the index into the original string

This field is used by the parallel streams spliterator

End of Java Sequential SearchStreamGang Example: Applying Spliterator (Part 1)