Java Streams: Applying Spliterators

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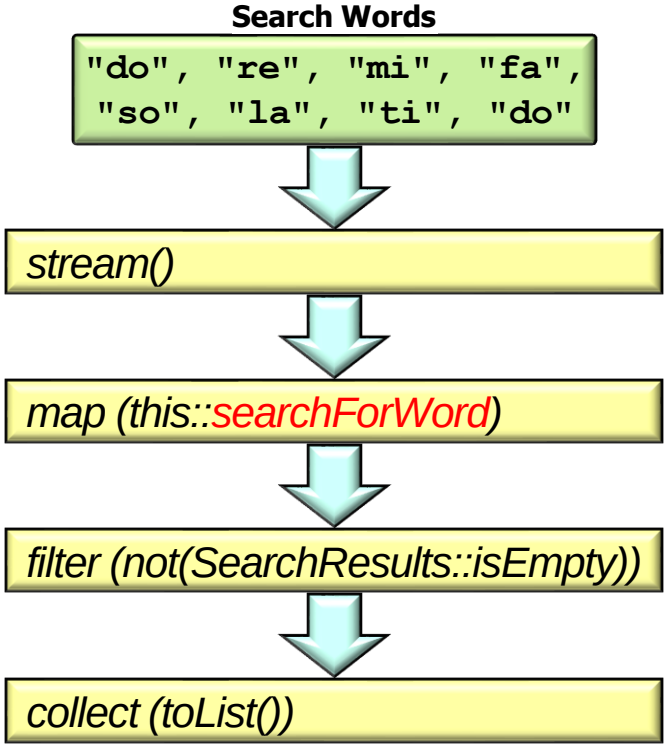
Learning Objectives in this Part of the Lesson

- Understand the structure & functionality of "Splittable iterators" (Spliterators)
- Recognize how to apply Spliterator to the SimpleSearchStream program



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

Applying Java Spliterator in SimpleSearchStream

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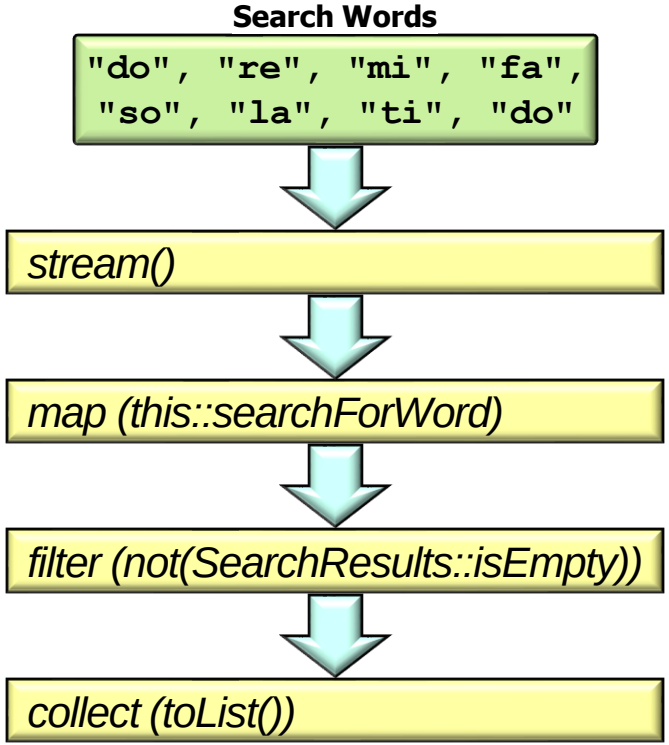
- The SimpleSearchStream program uses a sequential spliterator

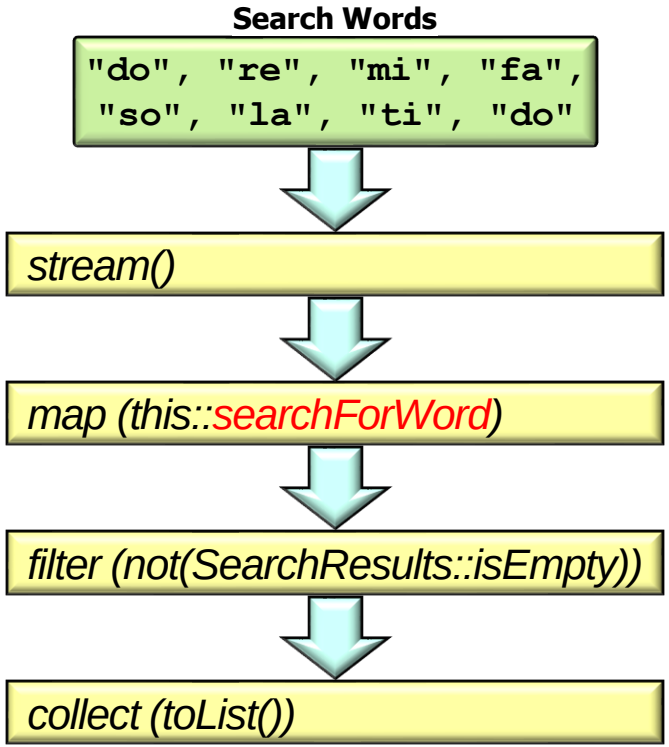


See github.com/douglascraigschmidt/LiveLessons/tree/master/SimpleSearchStream

Applying Java Spliterator in SimpleSearchStream

- searchForWord() uses the spliterator to find all instances of a word in the input & return a list of all the SearchResults

```
SearchResults searchForWord
                              (String word){
  return new SearchResults
    (..., word, ..., StreamSupport
      .stream(new WordMatchSpliterator
                              (mInput, word),
              false)
      .collect(toList()));
}
```



See SimpleSearchStream/src/main/java/search/WordSearcher.java

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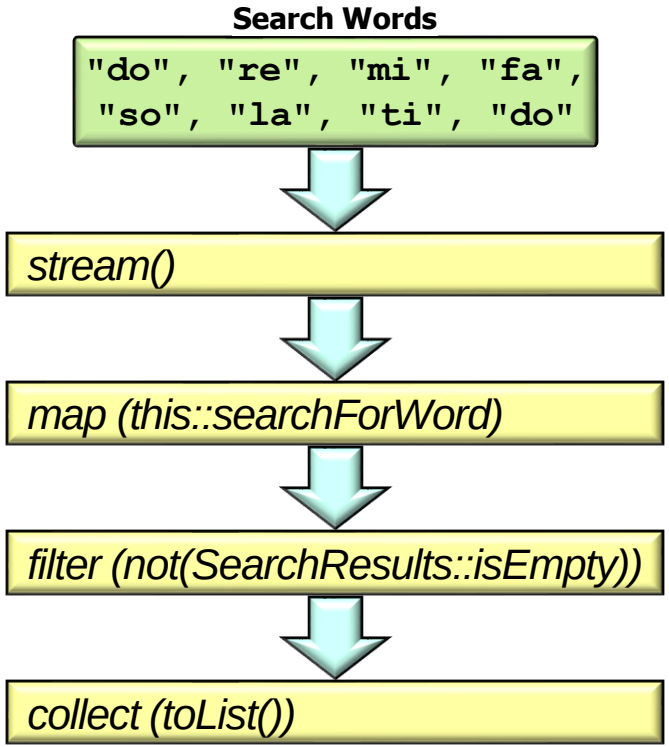
StreamSupport.stream() creates a sequential stream via the WordMatchSpliterator class



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

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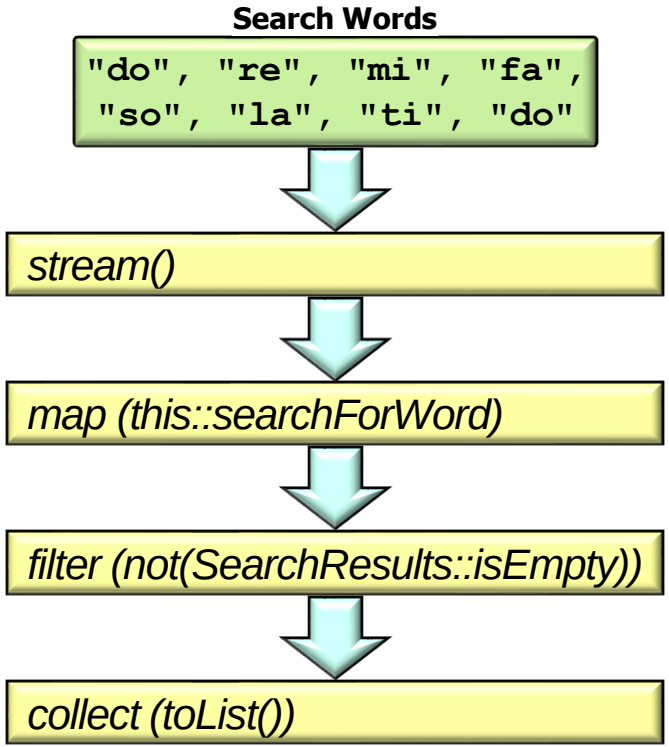
```

This stream is collected into a list of SearchResults.Result objects



Applying Java Spliterator in SimpleSearchStream

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

```
class WordMatchSpliterator
      extends Spliterators.AbstractSpliterator<Result> {
  private final Matcher mWordMatcher;


  public WordMatchSpliterator(String input, String word) {
    ...
    String regexWord = "\\b" + word.trim() + "\\b";

    mWordMatcher =
      Pattern.compile(regexWord,
                      Pattern.CASE_INSENSITIVE)
             .matcher(input); ...
```

See SimpleSearchStream/src/main/java/search/WordMatchSpliterator.java

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```

The extending class need only implement tryAdvance()

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

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```

An engine that performs regex match operations on a character sequence.

```
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    String regexWord = "\\b" + word.trim() + "\\b";

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             .matcher(input); ...
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See docs.oracle.com/javase/8/docs/api/java/util/regex/Matcher.html

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```

Constructor is passed the input string & a given word to search for matches.

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    mWordMatcher =
      Pattern.compile(regexWord,
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             .matcher(input); ...
```

This regex only matches a "word"

See www.vogella.com/tutorials/JavaRegularExpressions/article.html

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      Pattern.compile(regexWord,
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             .matcher(input); ...
```

Compile the regex & create a matcher for the input string

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

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

```
class WordMatchSpliterator
      extends Spliterators.AbstractSpliterator<Result> {
  ...
  public boolean tryAdvance(Consumer<? super Result> action) {
    if (!mWordMatcher.find())
      return false;

    else {
      action.accept(new Result(mWordMatcher.start()));
      return true;
    }
  }
}
```

Called by the Java 8 streams framework to attempt to advance the spliterator by one word match

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

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```

Passes the result (if any) back "by reference" to the streams framework

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```

Check if any remaining phrases in the input match the regex

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```

Inform the streams framework to cease calling tryAdvance() if there's no match

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      action.accept(new Result(mWordMatcher.start()));
      return true;
    }
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}
```

accept() stores the index in the input string where the match occurred, which is returned to the streams framework

See docs.oracle.com/javase/8/docs/api/java/util/function/Consumer.html#accept

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    if (!mWordMatcher.find())
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    else {
      action.accept(new Result(mWordMatcher.start()));
      return true;
    }
  }
}
```

Inform the streams framework to continue calling tryAdvance()

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- Here's a recap of how searchForWord() uses WordMatchSpliterator

```
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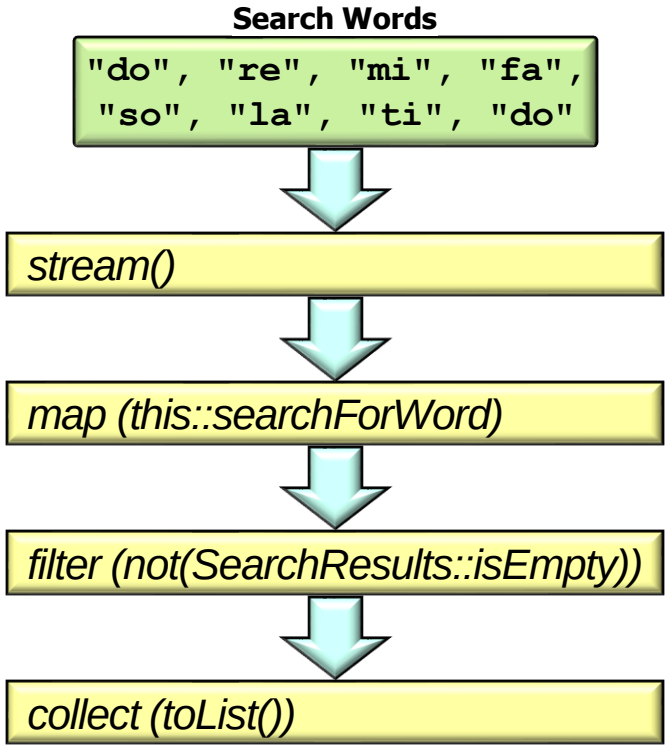

See SimpleSearchStream/src/main/java/search/WordMatchSpliterator.java

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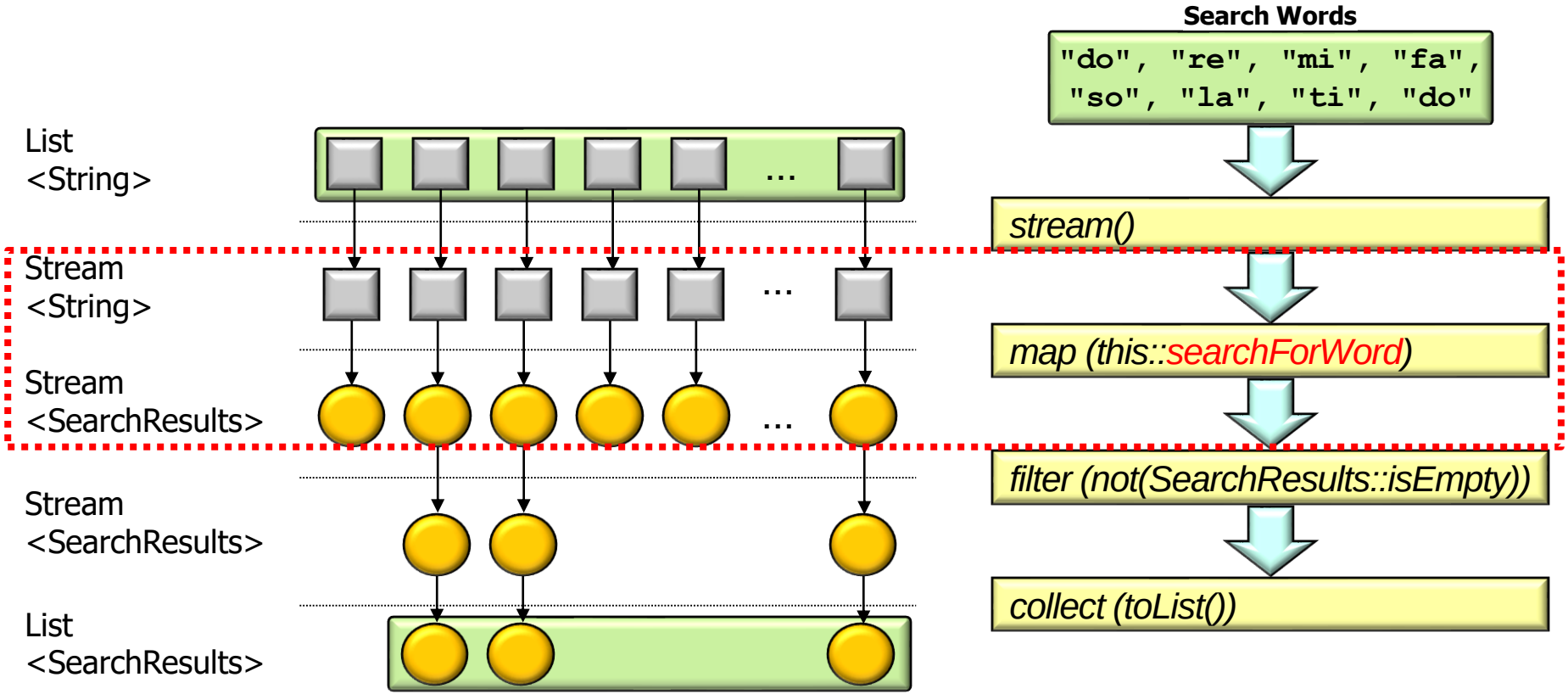
- Here's the output that searchForWord() & WordMatchSpliterator produce



End of Java 8 Streams: Applying Spliterators