

# Visualizing WordSearcher

## `.printSuffixSlice()`

**Douglas C. Schmidt**

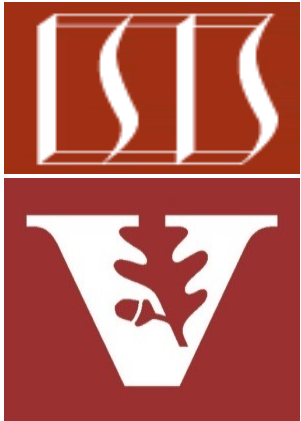
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**[www.dre.vanderbilt.edu/~schmidt](http://www.dre.vanderbilt.edu/~schmidt)**

**Professor of Computer Science**

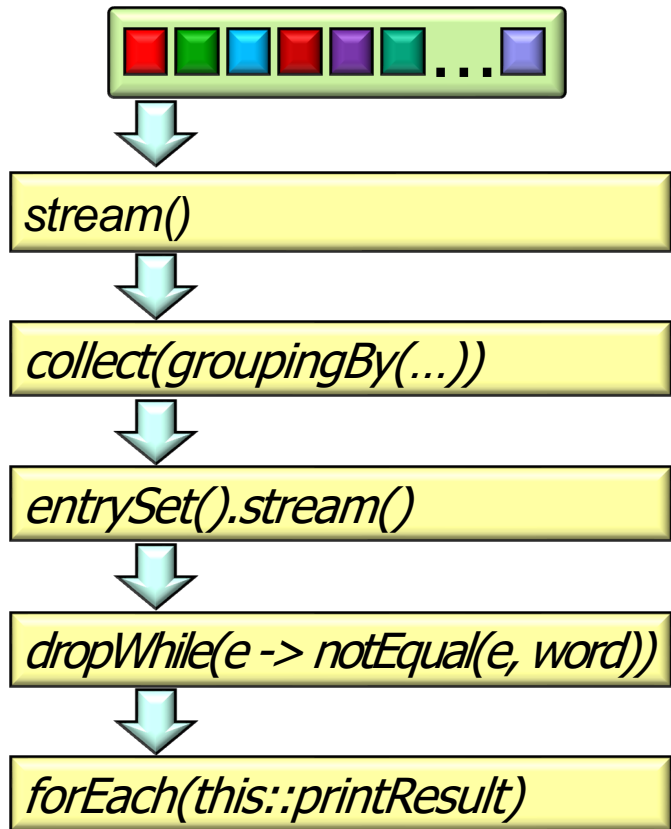
**Institute for Software  
Integrated Systems**

**Vanderbilt University  
Nashville, Tennessee, USA**



# Learning Objectives in this Part of the Lesson

- Visualize aggregate operations in SimpleSearchStream's WordSearcher.printResults() method
- Visualize aggregate operations in SimpleSearchStream's WordSearcher.printSuffixSlice() method



See [SimpleSearchStream/src/main/java/search/WordSearcher.java](https://github.com/oreilind/java-streams/blob/master/src/main/java/search/WordSearcher.java)

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# Visualizing the Word Searcher.printSuffixSlice() Method

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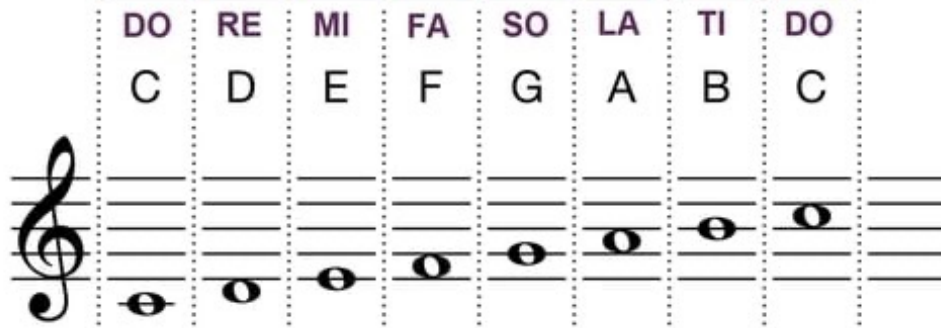
- Prints a slice of the listOfSearchResults starting at a particular word

```
wordSearcher.printSuffixSlice("La", results);
```

Word "La" appeared at indices [234|417|658|886|991|1207|1247|1269|1291|1339|1361|1742|1847|1863|1909|1949|2161|2254|2276|2283] with max index of 2283

Word "Ti" appeared at indices [237|994|1272|1294|1364|1850|1860|1912|1915|1952|1955|2299] with max index of 2299

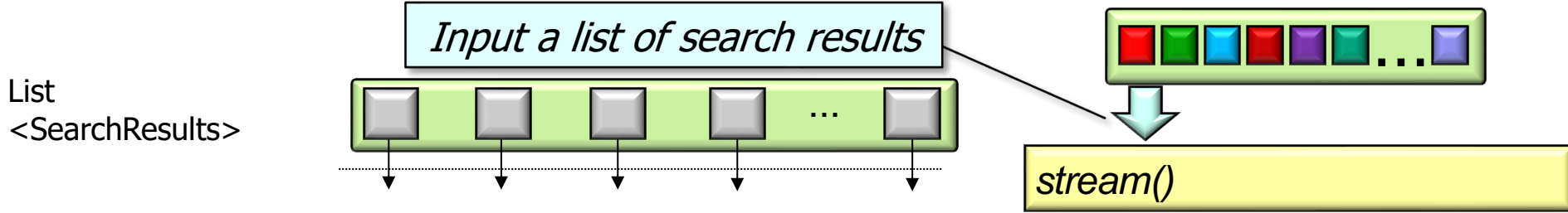
*Prints a slice of the stream from "La" to "Ti", while ignoring entries from "Do" to "So".*



This method shows the collect(groupingBy()) & dropWhile() aggregate operations

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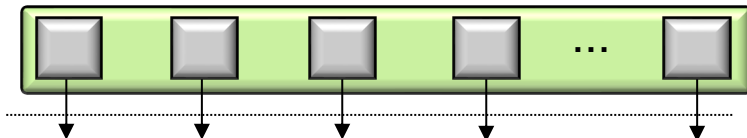


The search results correspond to words to find: "do", "re", "mi", "fa", "so", "la", "ti".

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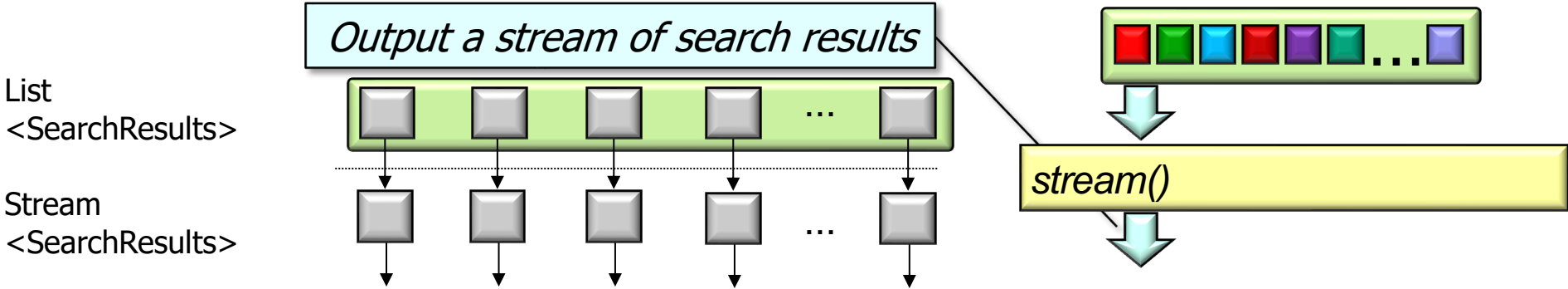
List  
<SearchResults>



Convert list to a (sequential) stream of search results

# Visualizing the WordSearcher.printSuffixSlice() Method

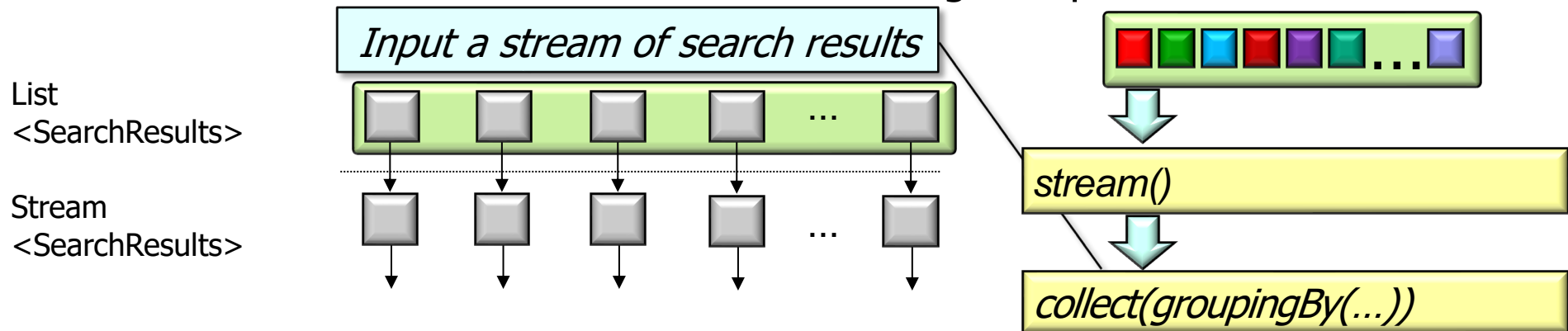
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Print out results of each map entry (key = word & value = list of search results)

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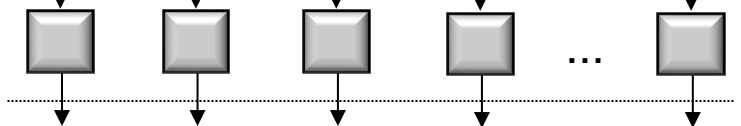
# Visualizing the WordSearcher.printSuffixSlice() Method

- Prints a slice of the listOfSearchResults starting at a particular word

List  
<SearchResults>



Stream  
<SearchResults>



`stream()`

`collect(groupingBy(...))`

Trigger "intermediate operation" processing

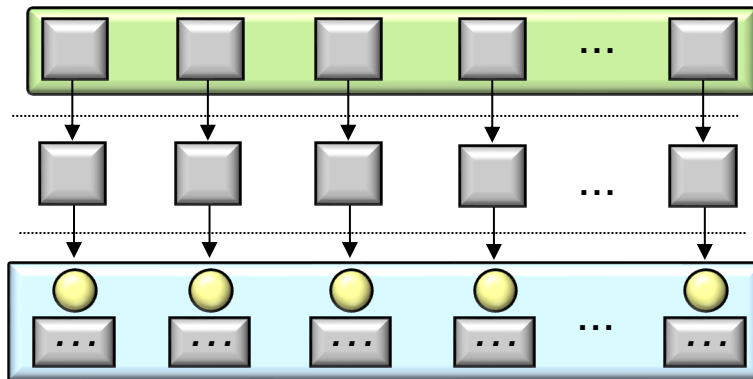
# Visualizing the WordSearcher.printSuffixSlice() Method

- Prints a slice of the listOfSearchResults starting at a particular word

List  
<SearchResults>

Stream  
<SearchResults>

Map<String, List  
<Result>>



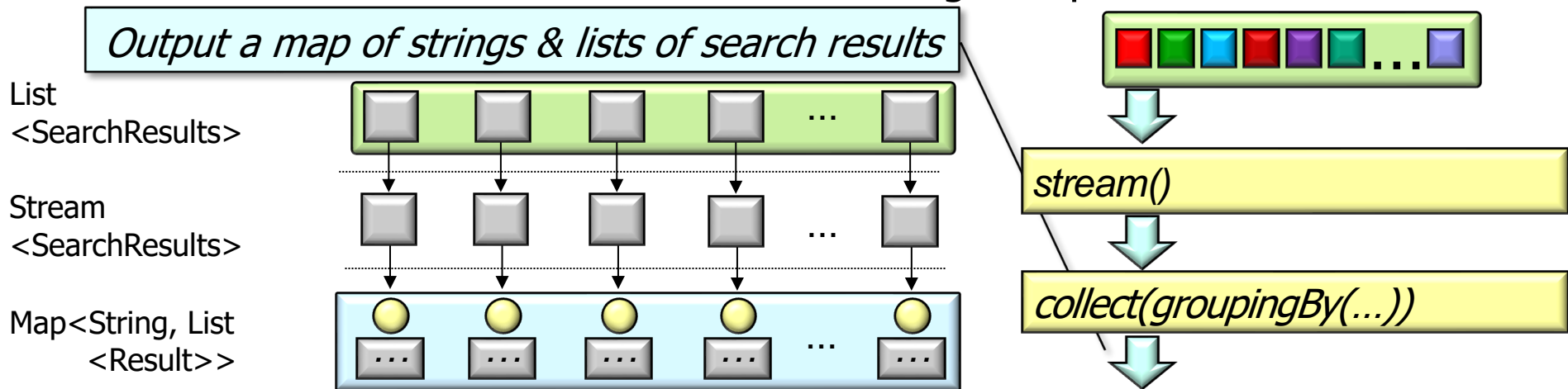
`stream()`

`collect(groupingBy(...))`

Create a map that groups words with the indices where each word was found.

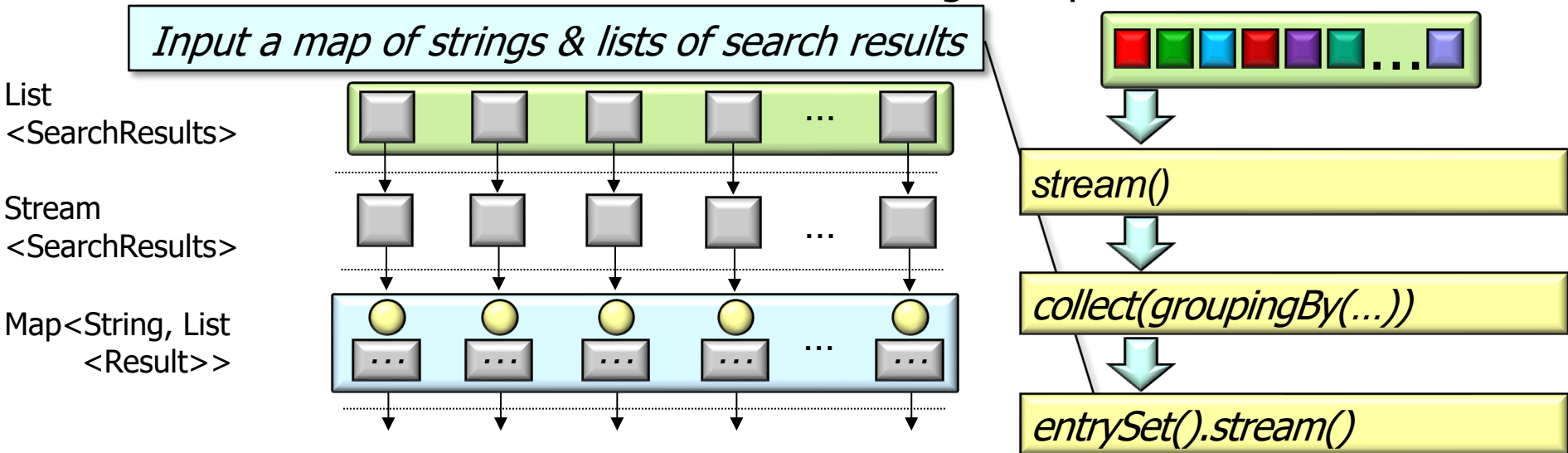
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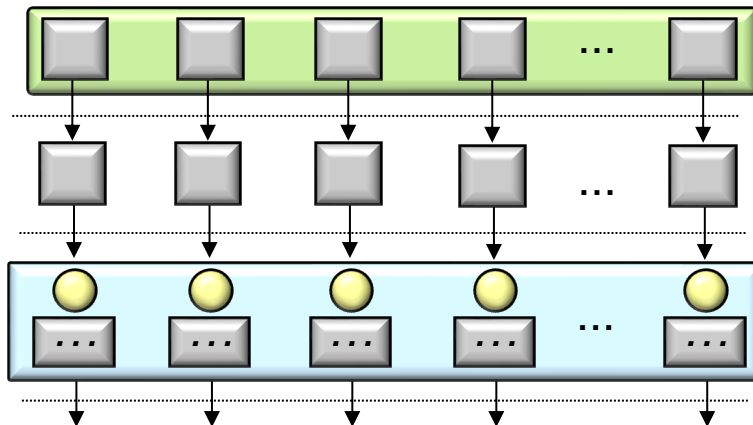
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List  
<SearchResults>

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Map<String, List  
<Result>>



*stream()*

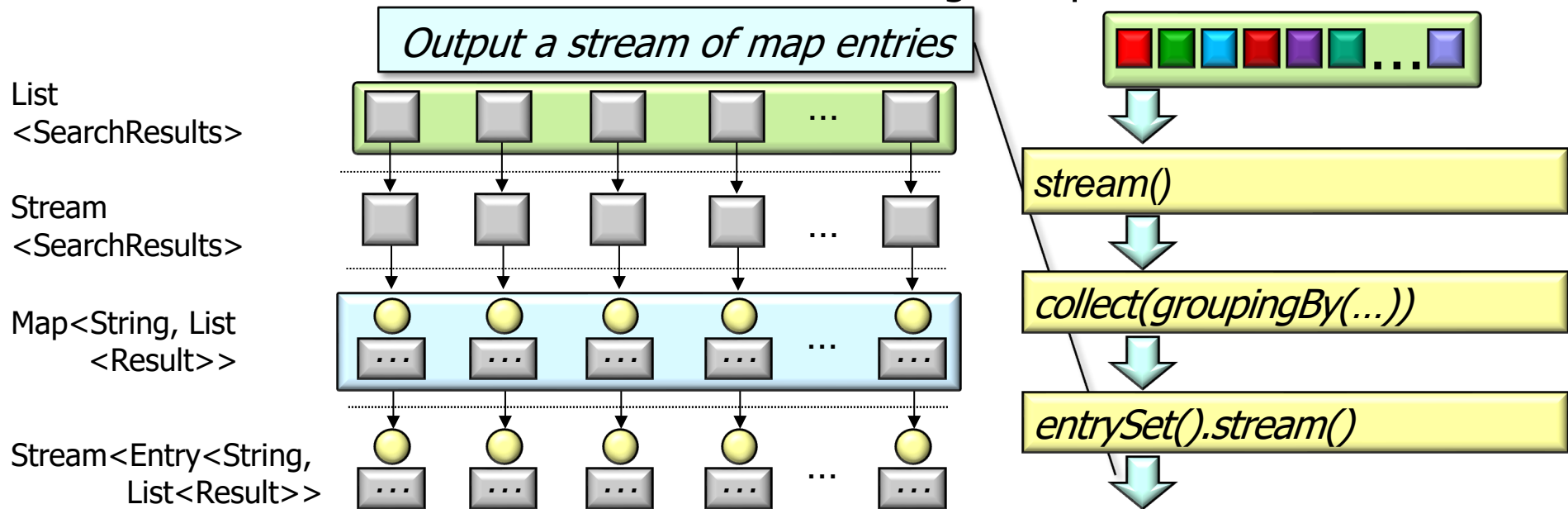
*collect(groupingBy(...))*

*entrySet().stream()*

Obtain the entry set from the map & convert it into a stream

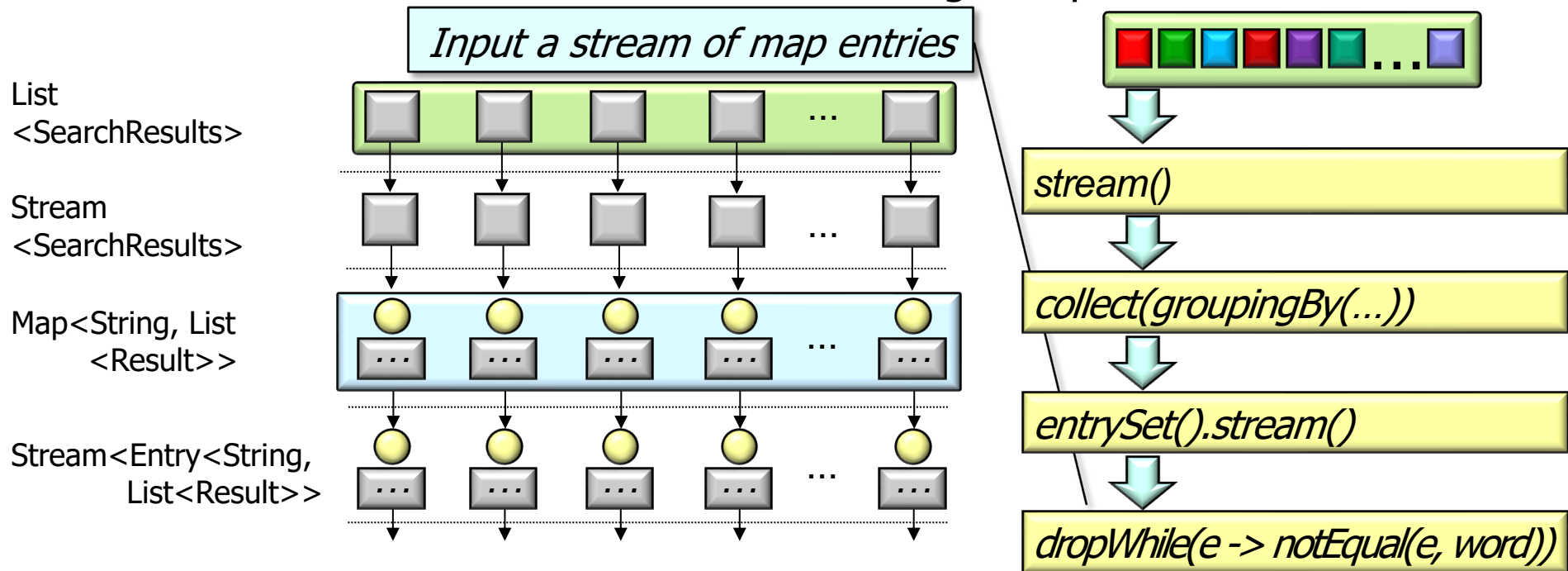
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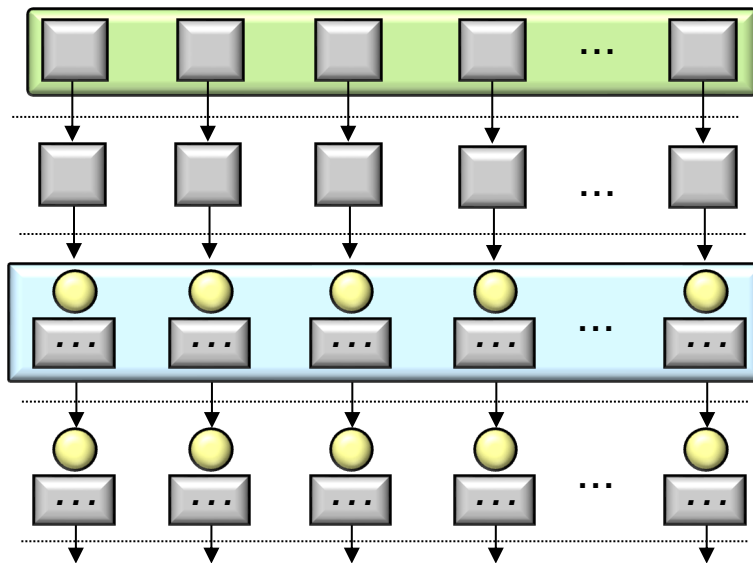
- Prints a slice of the listOfSearchResults starting at a particular word

List  
<SearchResults>

Stream  
<SearchResults>

Map<String, List  
<Result>>

Stream<Entry<String,  
List<Result>>



`stream()`

`collect(groupingBy(...))`

`entrySet().stream()`

`dropWhile(e -> notEqual(e, word))`

*Slice the stream to contain remaining elements after dropping subset of elements that don't match `word`.*

See [docs.oracle.com/javase/9/docs/api/java/util/stream/Stream.html#dropWhile](https://docs.oracle.com/javase/9/docs/api/java/util/stream/Stream.html#dropWhile)



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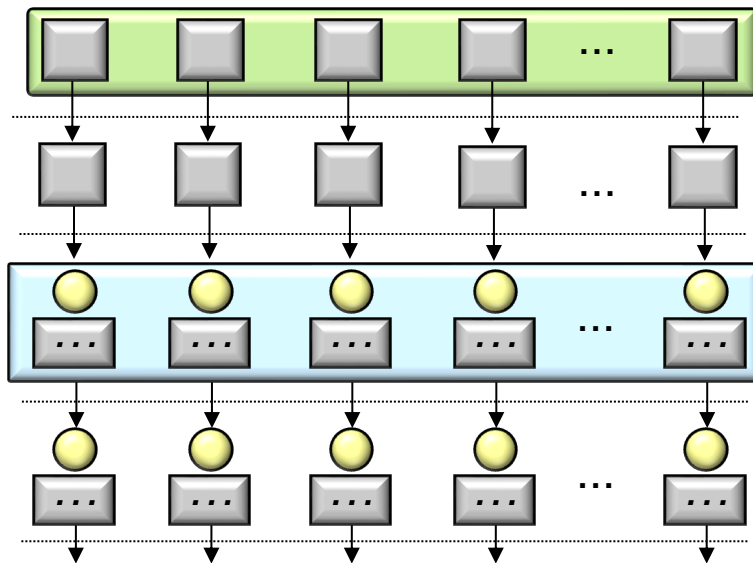
- Prints a slice of the listOfSearchResults starting at a particular word

List  
<SearchResults>

Stream  
<SearchResults>

Map<String, List  
<Result>>

Stream<Entry<String,  
List<Result>>



`stream()`

`collect(groupingBy(...))`

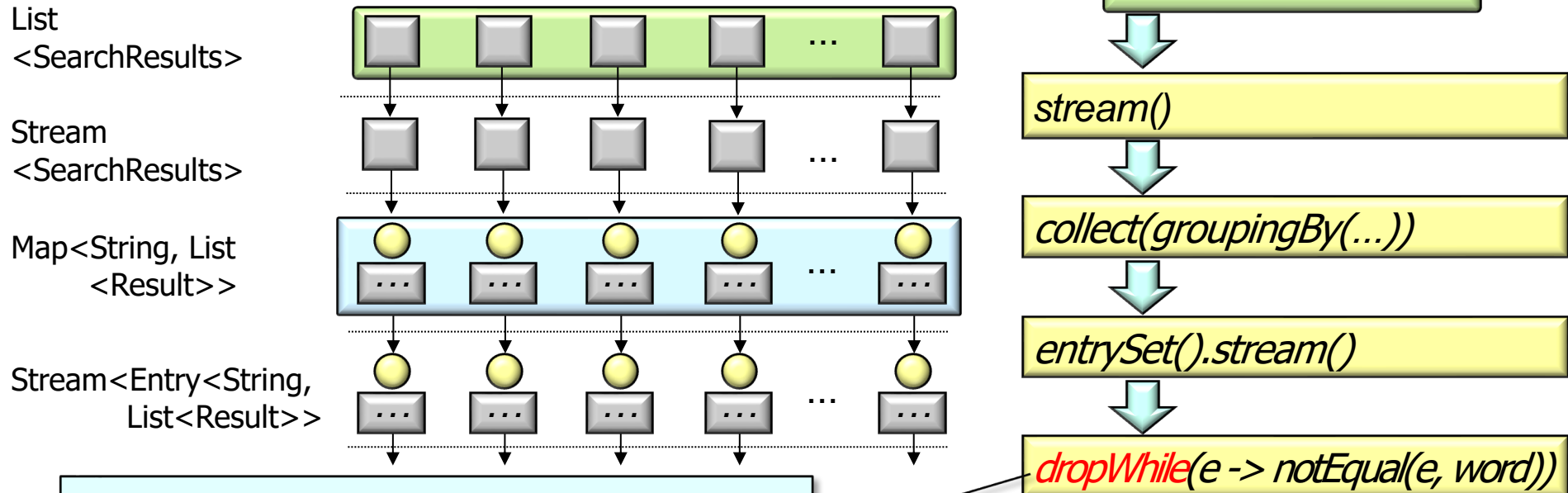
`entrySet().stream()`

`dropWhile(e -> notEqual(e, word))`

`notEqual()` implementation: `return !entry.getKey().equals(word)`

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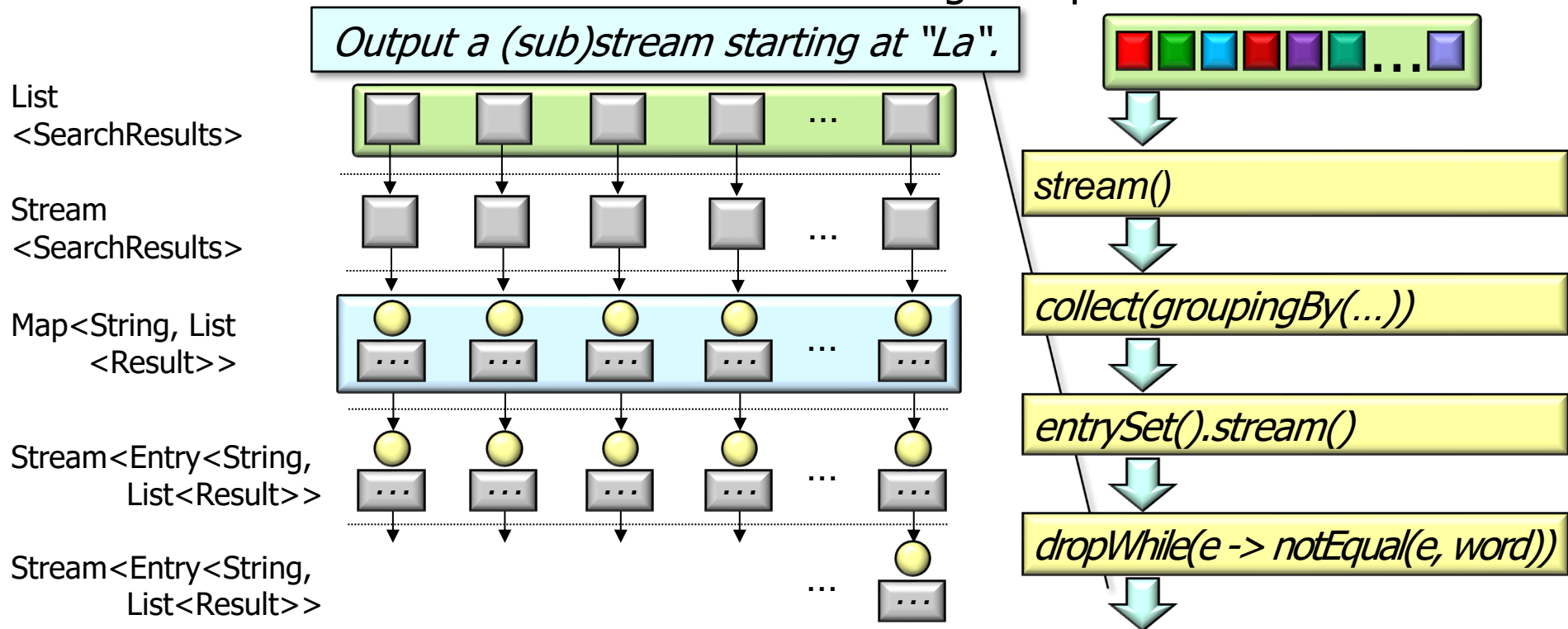
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See [itnext.io/streams-api-new-features-after-java-8-f2df81bed5ac](https://itnext.io/streams-api-new-features-after-java-8-f2df81bed5ac)

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# Visualizing the WordSearcher.printSuffixSlice() Method

- Prints a slice of the listOfSearchResults starting at a particular word

*Input a (sub)stream starting at "La".*



`stream()`

`collect(groupingBy(...))`

`entrySet().stream()`

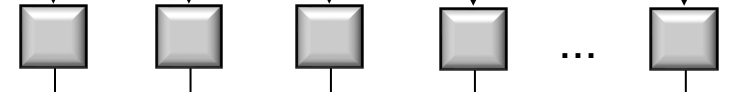
`dropWhile(e -> notEqual(e, word))`

`forEach(this::printResult)`

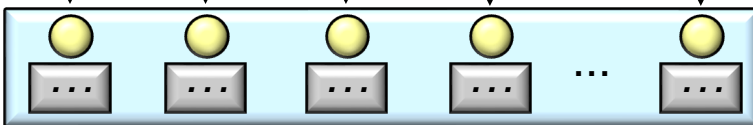
List  
<SearchResults>



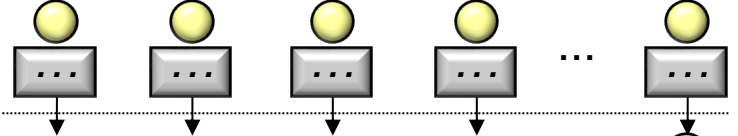
Stream  
<SearchResults>



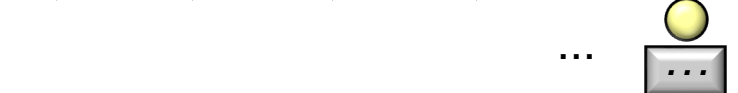
Map<String, List  
<Result>>



Stream<Entry<String,  
List<Result>>

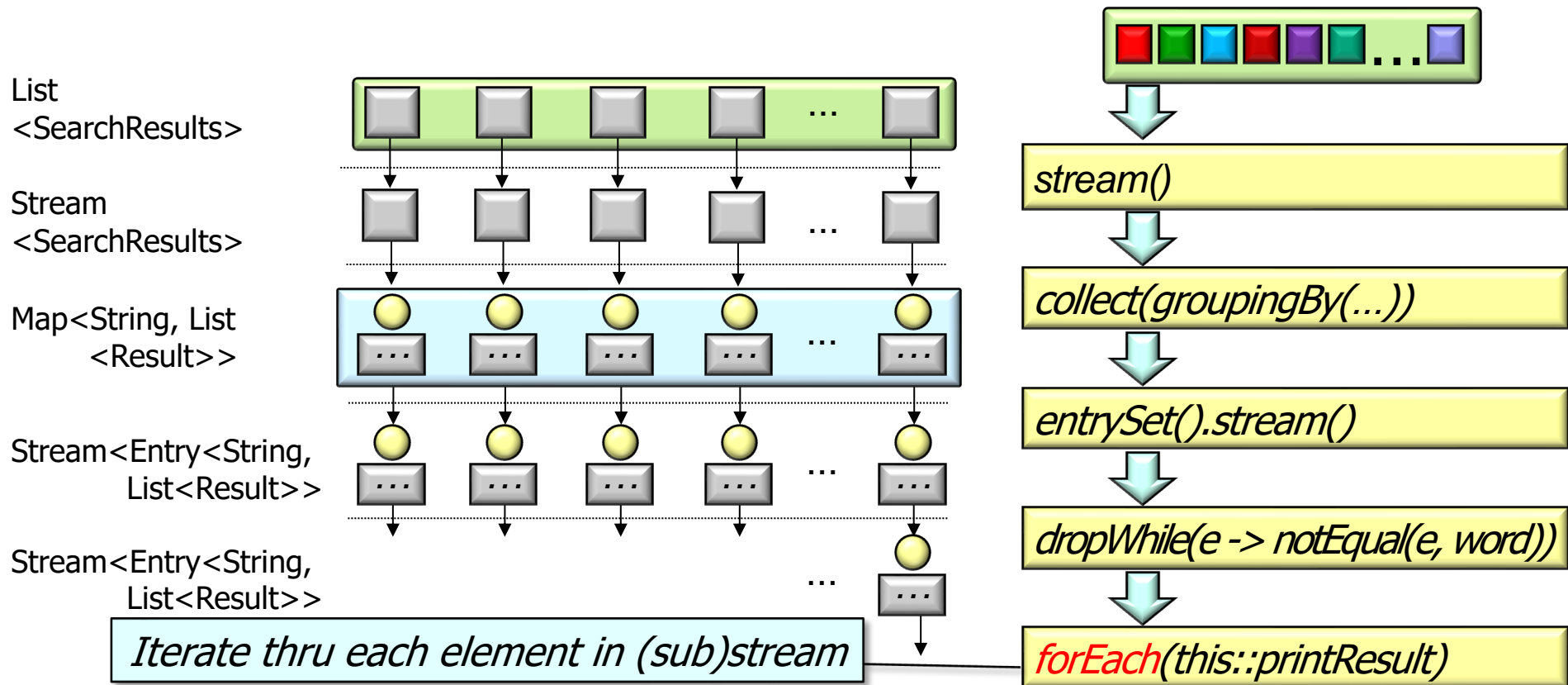


Stream<Entry<String,  
List<Result>>



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See [docs.oracle.com/javase/8/docs/api/java/util/stream/Stream.html#forEach](https://docs.oracle.com/javase/8/docs/api/java/util/stream/Stream.html#forEach)

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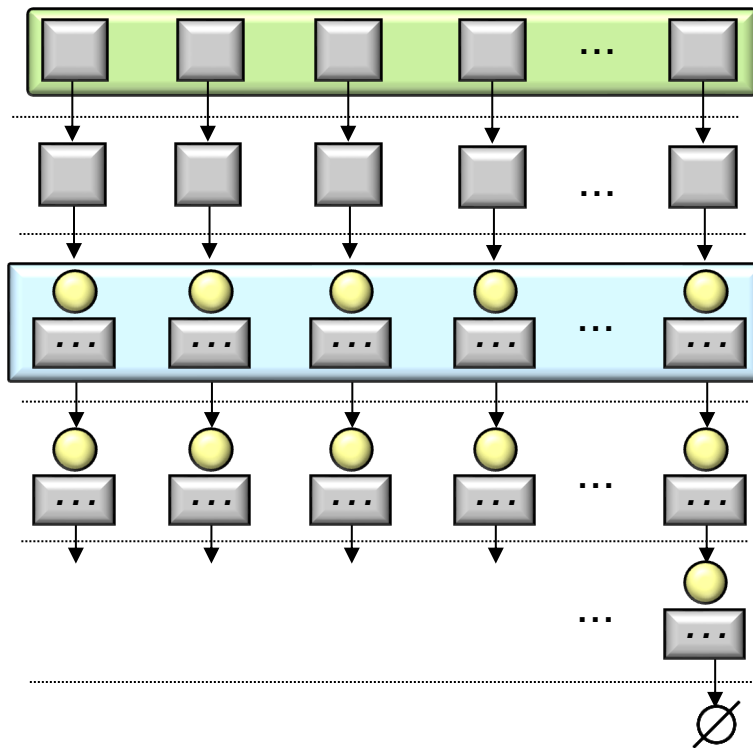
Stream  
<SearchResults>

Map<String, List  
<Result>>

Stream<Entry<String,  
List<Result>>

Stream<Entry<String,  
List<Result>>

Void



`stream()`

`collect(groupingBy(...))`

`entrySet().stream()`

`dropWhile(e -> notEqual(e, word))`

`forEach(this::printResult)`

Print out results of each map entry (key = word & value = list of search results)

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End of Visualizing Word  
Searcher.printSuffixSlice()