

# Implementing WordSearcher

## `.printResults()`

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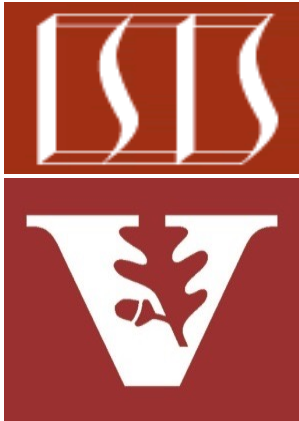
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# Learning Objectives in this Part of the Lesson

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- Visualize aggregate operations in SimpleSearchStream's WordSearcher .printResults() method
- Understand the implementation of aggregate operations in SimpleSearch Stream's WordSearcher.printResults() method

```
public void printResults (List<SearchResults> listOfResults) {  
    listOfResults  
        .stream()  
  
        .collect (groupingBy (SearchResults::getWord,  
                               LinkedHashMap::new,  
                               toDownstreamCollector ()))  
  
        .forEach (this::printResult) ;  
}
```

This lesson shows the collect(groupingBy()) & mapToInt() aggregate operations

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# Implementing the Word Searcher.printResults() Method

# Implementing the WordSearcher.printResults() Method

---

- This method prints the results of the word search

```
public void printResults(List<SearchResults> listOfResults) {  
    listOfResults  
        .stream()  
  
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                             LinkedHashMap::new,  
                             toDownstreamCollector()))  
  
        .forEach(this::printResult);  
}
```

---


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

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        .forEach(this::printResult);  
}
```



*Convert the list param into a stream.*

# Implementing the WordSearcher.printResults() Method

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                             LinkedHashMap::new,  
                             toDownstreamCollector()))  
  
    .forEach(this::printResult);  
}
```

*Collect SearchResults into a Map, with word as the key & the list of indices as the value.*

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        .forEach(this::printResult);  
}
```

*LinkedHashMap preserves the insertion order wrt iteration.*

# Implementing the WordSearcher.printResults() Method

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        .stream()  
  
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        .forEach(this::printResult);  
}
```

*This factory method creates a downstream collector that merges results lists together.*

See lesson on "Java Streams: Implementing Custom Non-Concurrent Collectors"



# Implementing the WordSearcher.printResults() Method

---

- This method prints the results of the word search

```
public void printResults(List<SearchResults> listOfResults) {  
    listOfResults  
        .stream()  
  
        .collect(groupingBy(SearchResults::getWord,  
                             LinkedHashMap::new,  
                             toDownstreamCollector()))  
  
        .forEach(this::printResult);  
}
```

*Print out the matching results in the stream.*

---

This is the Map forEach() method *not* the Stream forEach() method!

# Implementing the WordSearcher.printResults() Method

---

- Print a word & its list of indices to the output

```
private void printResult(String word,
                        List<SearchResults.Result> results) {
    System.out.print("Word \""
                    + word
                    + "\" appeared at indices ");

    SearchResults.printResults(results);

    System.out.println(" with max index of "
                      + computeMax(results));
}
```

# Implementing the WordSearcher.printResults() Method

---

- Print a word & its list of indices to the output

```
private void printResult(String word,  
                        List<SearchResults.Result> results) {  
    System.out.print("Word \""  
                    + word  
                    + "\" appeared at indices ");
```

*Print the word followed by the list of search results.*

```
SearchResults.printResults(results);  
  
System.out.println(" with max index of "  
                  + computeMax(results));  
}
```

# Implementing the WordSearcher.printResults() Method

- Print a word & its list of indices to the output

```
private void printResult(String word,  
                        List<SearchResults.Result> results) {  
    System.out.print("Word \""  
                    + word  
                    + "\" appeared at indices ");
```

*Compute & print the max index.*

```
    SearchResults.printResults(results);
```

```
    System.out.println(" with max index of "  
                    + computeMax(results));
```

```
}
```

# Implementing the WordSearcher.printResults() Method

---

- Compute the max index in the list of search results

```
private int computeMax(List<SearchResults.Result> results) {  
    return results  
        .stream()  
  
        .mapToInt(SearchResults.Result::getIndex)  
  
        .max()  
  
        .orElse(0);  
}
```

---

This implementation works properly even if the results are not sorted!

# Implementing the WordSearcher.printResults() Method

- Compute the max index in the list of search results

```
private int computeMax(List<SearchResults.Result> results) {  
    return results  
        .stream()  
        .mapToInt(SearchResults.Result::getIndex)  
        .max()  
        .orElse(0);  
}
```

*Convert the list results into a stream of results*

# Implementing the WordSearcher.printResults() Method

- Compute the max index in the list of search results

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private int computeMax(List<SearchResults.Result> results) {  
    return results  
        .stream()  
  
        .mapToInt(SearchResults.Result::getIndex)  
  
        .max()  
  
        .orElse(0);  
}
```

*Map the stream of Result objects into a stream of int primitives.*

# Implementing the WordSearcher.printResults() Method

- Compute the max index in the list of search results

```
private int computeMax(List<SearchResults.Result> results) {  
    return results  
        .stream()  
  
        .mapToInt(SearchResults.Result::getIndex)  
  
        .max()  
  
        .orElse(0);  
}
```

*Returns an OptionalInt describing the maximum element of this stream or an empty optional if this stream is empty*

**OPTIONAL**



# Implementing the WordSearcher.printResults() Method

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```
private int computeMax(List<SearchResults.Result> results) {  
    return results  
        .stream()  
  
        .mapToInt(SearchResults.Result::getIndex)  
  
        .max()  
  
        .orElse(0);  
}
```

*Return the value (as an int) if present, otherwise return 0.*

**OPTIONAL**

---

End of Implementing Word  
Searcher.printResults()