Learning Objectives in this Part of the Lesson

- Visualize aggregate operations in SimpleSearchStream’s WordSearcher .printResults() method
Visualizing the Word Searcher.printResults() Method
Visualizing the WordSearcher.printResults() Method

- Prints the index locations of any/all of the found words

```java
wordSearcher.printResults(results);
```

Word "Do" appeared at indices [128|138|148|199|209|219|503|972|976|997|1004|1022|1204|1216|1231|1244|1256|1266|1275|1281|1288|1297|1303|1336|1348|1358|1367|1373|1828|1832|1853|1857|1879|1919|2251|2263|2273|2302|2309] with max index of 2309

Word "Re" appeared at indices [131|141|151|202|212|222|979|1025|1219|1259|1278|1300|1351|1370|1835|1875|1899|1939|2266|2295] with max index of 2295

Word "Mi" appeared at indices [134|144|154|205|215|225|982|1028|1213|1253|1345|1838|1872|1882|1885|1889|1922|1925|1929|2260|2292] with max index of 2292

Word "Fa" appeared at indices [228|985|1031|1210|1250|1342|1841|1869|1902|1905|1942|1945|2257|2279|2289] with max index of 2289

Word "So" appeared at indices [231|988|1001|1034|1041|1201|1241|1263|1285|1333|1355|1413|1844|1866|1892|1895|1932|1935|2248|2270|2286|2306] with max index of 2306

...
Visualizing the WordSearcher.printResults() Method

- Prints the index locations of any/all of the found words

Input a list of search results

List
<SearcResults>

... stream()

The search results correspond to words to find: "do","re","mi","fa","so","la","ti".
Visualizing the WordSearcher.printResults() Method

- Prints the index locations of any/all of the found words

List
<SearchResults>

stream()

Convert list to a (sequential) stream of search results
Visualizing the `WordSearcher.printResults()` Method

- Prints the index locations of any/all of the found words

List<SearchResults>

Output a stream of search results

Stream<SearchResults>

`stream()`
Visualizing the WordSearcher.printResults() Method

- Prints the index locations of any/all of the found words

List `<SearchResults>`

Stream `<SearchResults>`

Input a stream of search results
Visualizing the WordSearcher.printResults() Method

- Prints the index locations of any/all of the found words

List <SearchResults>

Stream <SearchResults>

Trigger “intermediate operation” processing
Visualizing the WordSearcher.printResults() Method

- Prints the index locations of any/all of the found words

```
Stream<SearchResults>
<table>
<thead>
<tr>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>stream()</td>
</tr>
<tr>
<td>collect(groupingBy(...))</td>
</tr>
</tbody>
</table>
```

Create a map that groups words with the indices where they were found
Visualizing the WordSearcher.printResults() Method

- Prints the index locations of any/all of the found words

Output a map of strings & lists of search results

List <SearchResults>

Stream <SearchResults>

Map<String, List<Result>>
Visualizing the WordSearcher.printResults() Method

- Prints the index locations of any/all of the found words

**Input a map of strings & lists of search results**

List

\<SearchResults\>

Stream

\<SearchResults\>

Map\<String, List <Result>>

Map<String, List<Result>>
Visualizing the WordSearcher.printResults() Method

- Prints the index locations of any/all of the found words

Iterate through all the key/value pairs in the map
Visualizing the WordSearcher.printResults() Method

- Prints the index locations of any/all of the found words

List <SearchResults>

Stream <SearchResults>

Map<String, List<Result>>

This is the Map forEach() method, not the Stream forEach() method

See docs.oracle.com/javase/8/docs/api/java/util/Map.html#forEach
Visualizing the WordSearcher.printResults() Method

- Prints the index locations of any/all of the found words

```java
Stream<SearchResults>
List<SearchResults>
Map<String, List<Result>>
Void

stream()
collect(groupingBy(…))
forEach(this::printResult)

Print out results of each map entry (key = word & value = list of search results)
End of Java Streams: Visualizing Word Searcher.printResults()