Creating and Analyzing Histograms from Streams



José Paumard
PHD, JAVA CHAMPION, JAVA ROCK STAR

@JosePaumard https://github.com/JosePaumard



Agenda



Let us create maps with collectors

Using groupingBy()

And see how to use downstream collectors



Creating Maps with GroupingBy



A List of Cities with Their State

Austin

Provo

Texas

Utah

A List of Cities with Their State

```
Houston
               Texas
                           cities.stream()
                                  .collect(
Salt Lake City
              Utah
                                     Collectors.groupingBy(
Dallas
               Texas
                                       city -> city.getState()
               Colorado
Denver
                                  );
               Colorado
Boulder
Austin
               Texas
                                    Map<String, List<City>>
Provo
               Utah
```



The groupingBy collector

- groups data using a function
- by default gather the objects in lists



A List of Cities with Their State

Houston Texas

Salt Lake City Utah

Dallas Texas

Denver Colorado

Boulder Colorado

Austin Texas

Provo Utah

Texas → Houston, Dallas, Austin

Utah → Salt Lake City, Provo

Colorado — Denver, Boulder



GroupingBy with a Downstream Collector





A downstream collector

Is a collector that is applied

To the stream of the values



A Count of the Cities per State

```
Texas → Houston, Dallas, Austin Collectors.counting()

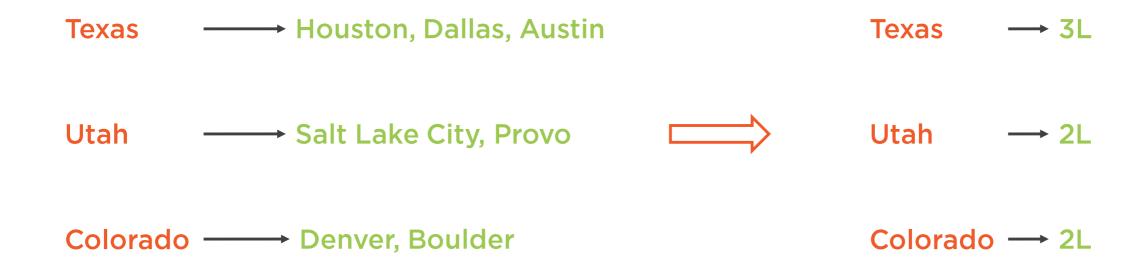
Utah → Salt Lake City, Provo

Salt Lake City, Provo

Collect(
Collectors.counting()

Colorado → Denver, Boulder
```

A Count of the Cities per State





Demo



Let us write some code!

Build maps, post-process their values

And extract information out of them



```
Map<City, Long> peopleByCity = ...;
City cityWithTheMostPeople =
    peopleByCity.entrySet().stream()
        .max(Map.Entry.comparingByValue())
        .orElseThrow()
        .getKey();
```

No map.stream() method

So to stream a map, the solution is to use its entry set



Module Wrap Up



What did you learn?

How to create maps with the groupingBy() collector

Adding downstream collectors

To create complex maps and histograms

And stream the key value pairs

To analyze them



Course Wrap Up



What did you learn?

The basics of the Stream API

As an implementation of the Map / Filter / Reduce pattern

A Stream does not hold any data

A Stream must be connected to a source

Reducing data with reduce and collect

Creating and analyzing maps with groupingBy and downstream collectors



Course Wrap Up



Thank you!

@JosePaumard

https://github.com/JosePaumard

https://www.youtube.com/user/jpaumard

