HowToDoInJava

Getting the Last Item of a Stream

📅 Last Updated: March 14, 2022   👤 By: Lokesh Gupta   📁 Java 8   🏷️ Java 8, Java Stream Basics

Learn to find the **last element of a** [stream in Java](). We will learn to use finite as well as [infinite streams]() as well.

1. Getting Last Item with Stream Reduction

The `reduce()` method uses the [reduction technique]() on the elements of the *Stream*. To get the last element, it continues picking up the two elements of the stream and choosing the latter. This will go on until all elements are exhausted.

At the end of the reduction process, we will have the last element of the stream.

Get last element using reduce() method

```
Stream<Integer> stream = Arrays.asList(1, 2, 3, 4, 5, 6, 7, 8, 9)
                    .stream();

Integer lastElement = stream.reduce((first, second) -> second)
            .orElse(-1);
```

```
System.out.println(lastElement);  // Prints 9
```

The `reduce()` method returns an `Optional` which gives us the choice of what to do when an empty element is returned. For example, the stream itself might be empty.

If the Stream is empty

```
Stream<Integer> emptyStream = Stream.empty();


//Return -1 if stream is empty
Integer lastElement = emptyStream.reduce((first, second) -> second)
                .orElse(-1);

System.out.println(lastElement);  //-1

//Throw IllegalStateException if stream is empty

Integer lastElement = emptyStream.reduce((first, second) -> second)
        .orElseThrow(() -> new IllegalStateException("no last element
```

Program output:

```
-1

Exception in thread "main" java.lang.IllegalStateException: no last e
    at com.howtodoinjava.core.streams.misc.GetLastElement.lambda$1(Ge
    at java.util.Optional.orElseThrow(Unknown Source)
    at com.howtodoinjava.core.streams.misc.GetLastElement.main(GetLas
```

2. Using Streams.findLast() from Guava

Streams.findLast() is really neat, readable, and provides good performance. It returns the last element of the specified stream, or `Optional.empty()` if the stream is empty.

Streams.findLast() example

```
Stream<Integer> stream = Arrays.asList(1, 2, 3, 4, 5, 6, 7, 8, 9)
                    .stream();

Integer lastElement = Streams.findLast(stream2).orElse(-1);

System.out.println(lastElement);   // Prints 9
```

3. Last Item from an Infinite streams

Can there be any last element in an infinite stream? No, there cannot be. So make sure that the stream is not infinite when we are trying to find the last element of the stream. None of the above-listed APIs will return any value or throw an exception.

In fact, the above solutions will not even return and halt the program execution completely.

Last Element of Infinite stream

```
Stream<Integer> stream = Stream.iterate(0, i -> i + 1);

Integer lastElement = Streams.findLast(stream).orElse(-1);   // Halts

System.out.println(lastElement);
```

Use `limit()` to get a finite stream out of a given infinite stream.

```
Stream<Integer> infiniteStream = Stream.iterate(0, n -> n + 2);
```

```
lastElement = infiniteStream.limit(100)
                    .reduce((first, second) -> second)
                    .orElse(-1);

System.out.println(lastElement);    //198
```

Drop me your questions in the comments related to **how to find the last element of a stream**.

Happy Learning !!

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1. Check if Array Contains an Item in Java

2. Getting Distinct Stream Items by Comparing Multiple Fields

3. Java Stream reuse – traverse stream multiple times?

4. Java Stream sorted()

5. Java Stream toArray()

6. Java Stream findFirst()

7. Java Stream findAny()

8. Java Stream max()

9. Java Stream limit()

0. Sorting a Stream by Multiple Fields in Java

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