

Java 8 Stream concat()

📅 Last Updated: August 30, 2020 👤 By: Lokesh Gupta 📁 Java 8 💎 Java Stream Basics

Learn to use **Stream.concat()** method is used to **merge two streams into one stream** which consist of all elements of both merged streams.

1. Stream concat() method

Syntax

```
static <T> Stream<T> concat(Stream<? extends T> firstStream,  
                           Stream<? extends T> secondStream)
```

- This method creates a **lazily concatenated stream** whose elements are all the elements of the **firstStream** followed by all the elements of the **secondStream**.
- The resulting stream is **ordered** if both of the input streams are ordered.
- The resulting stream is **parallel** if either of the input streams is parallel.
- When the resulting stream is **closed**, the close handlers for both input streams are invoked.

2. Merge two streams

Java example to merge two streams of numbers – to obtain an stream which contains numbers from both streams.

How to merge two java streams

```
import java.util.stream.Stream;

public class Main
{
    public static void main(String[] args)
    {
        Stream<Integer> firstStream = Stream.of(1, 2, 3);
        Stream<Integer> secondStream = Stream.of(4, 5, 6);

        Stream<Integer> resultingStream = Stream.concat(firstStream, secondStream);

        System.out.println( resultingStream.collect(Collectors.toList()) );
    }
}
```

Program Output.

Console

```
[1, 2, 3, 4, 5, 6]
```

3. Merge multiple streams

Java example to merge four streams of numbers – to obtain an stream which contains numbers from all streams. Notice we have made a **static import to Stream.concat()** function which makes the code readable.

How to merge multiple java streams

```
import java.util.stream.Collectors;
import java.util.stream.Stream;
import static java.util.stream.Stream.*;

public class Main
{
    public static void main(String[] args)
    {
        Stream<Integer> first = Stream.of(1, 2);
        Stream<Integer> second = Stream.of(3,4);
        Stream<Integer> third = Stream.of(5, 6);
        Stream<Integer> fourth = Stream.of(7,8);
    }
}
```

```
Stream<Integer> resultingStream = Stream.concat(first, concat(second, concat

System.out.println( resultingStream.collect(Collectors.toList()) );

}

}
```

Program Output.

Console

```
[1, 2, 3, 4, 5, 6, 7, 8]
```

4. Java merge streams and retain unique elements

4.1. Numbers and strings

While merging two streams, we can use **distinct()** API and resulting stream will contain only unique elements.

Merge streams and retain unique elements

```
import java.util.stream.Collectors;
import java.util.stream.Stream;

public class Main
{
    public static void main(String[] args)
    {
        Stream<Integer> firstStream = Stream.of(1, 2, 3, 4, 5, 6);
        Stream<Integer> secondStream = Stream.of(4, 5, 6, 7, 8, 9);

        Stream<Integer> resultingStream = Stream.concat(firstStream, secondStream)
                                                .distinct();

        System.out.println( resultingStream.collect(Collectors.toList()) );
    }
}
```

Program Output.

Console

```
[1, 2, 3, 4, 5, 6, 7, 8, 9]
```

4.2. Custom objects

In case of merging streams of custom objects, we can drop the duplicate elements during [stream iteration](#). We can use the **distinctByKey()** function created for [java stream distinct by object property](#) example.

Merge streams and retain unique objects

```
import java.util.ArrayList;
import java.util.Map;
import java.util.concurrent.ConcurrentHashMap;
import java.util.function.Function;
import java.util.function.Predicate;
import java.util.stream.Collectors;
import java.util.stream.Stream;

public class Main
{
    public static void main(String[] args)
    {
        Stream<Employee> stream1 = getEmployeeListOne().stream();
        Stream<Employee> stream2 = getEmployeeListTwo().stream();

        Stream<Employee> resultingStream = Stream.concat(stream1, stream2)
            .filter(distinctByKey(Employee::getFirstName));

        System.out.println( resultingStream.collect(Collectors.toList()) );
    }

    public static <T> Predicate<T> distinctByKey(Function<? super T, Object> keyExtractor)
    {
        Map<Object, Boolean> map = new ConcurrentHashMap<>();
        return t -> map.putIfAbsent(keyExtractor.apply(t), Boolean.TRUE) == null;
    }

    private static ArrayList<Employee> getEmployeeListOne()
    {
        ArrayList<Employee> list = new ArrayList<>();
        list.add( new Employee(1l, "Lokesh", "Gupta") );
        list.add( new Employee(5l, "Brian", "Piper") );
        list.add( new Employee(7l, "Charles", "Piper") );
        list.add( new Employee(6l, "David", "Beckham") );

        return list;
    }
}
```

```
}

private static ArrayList<Employee> getEmployeeListTwo()
{
    ArrayList<Employee> list = new ArrayList<>();
    list.add( new Employee(21, "Lokesh", "Gupta") );
    list.add( new Employee(41, "Brian", "Piper") );
    list.add( new Employee(31, "David", "Beckham") );
    return list;
}
}
```

Program Output.

Console

```
[
Employee [id=1, firstName=Lokesh, lastName=Gupta],
Employee [id=5, firstName=Brian, lastName=Piper],
Employee [id=7, firstName=Charles, lastName=Piper],
Employee [id=6, firstName=David, lastName=Beckham]]
```

Drop me your questions in comments section related to **merging two or more streams** of objects in [Java 8](#).

Happy Learning !!

Reference:

[Stream concat\(\) API Docs](#)

Was this post helpful?

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Yes

No

Recommended Reading:

1. [Java String concat\(\) method example](#)
2. [Java Stream reuse – traverse stream multiple times?](#)
3. [Java Stream forEach\(\)](#)
4. [Java Stream max\(\)](#)
5. [Java Stream limit\(\)](#)
6. [Java Stream skip\(\)](#)
7. [Sorting a Stream by Multiple Fields in Java](#)
8. [Java 8 – Join or append stream of strings](#)
9. [Convert Iterable or Iterator to Stream in Java](#)
0. [Java Stream findAny\(\)](#)



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2 thoughts on “Java 8 Stream concat()”

Takidoso

August 20, 2019 at 7:22 pm

Hi actually the merging is a concatenating here.

What I am interested in is how to merge streams like figuratively a zipper.

having stream A with numbers (1, 3, 5, 7...) and stream B with even ones (2, 4 ,6 ,8 ...)

and a merge result of exactly like this:

(1,2,3,4,5,6,7,8, ...)

[Reply](#)

Girraj

December 12, 2019 at 11:37 am

```
Stream a = Stream.of(1,3,5,7);  
Stream b = Stream.of(2,4,6,8);  
Stream c = Stream.concat(a,b).sorted();
```

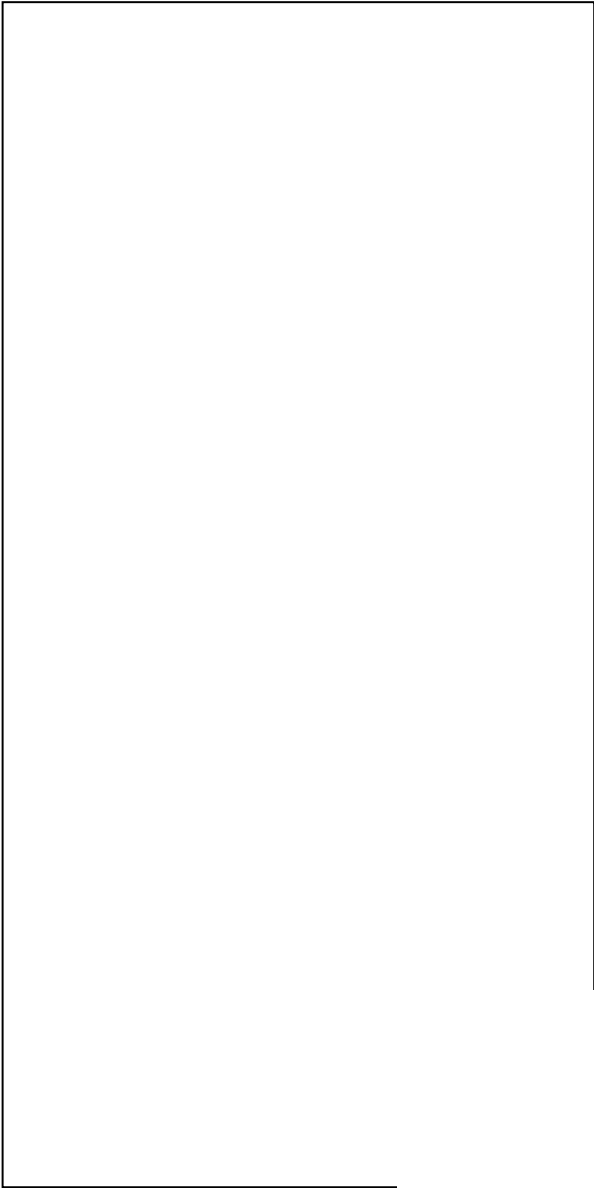
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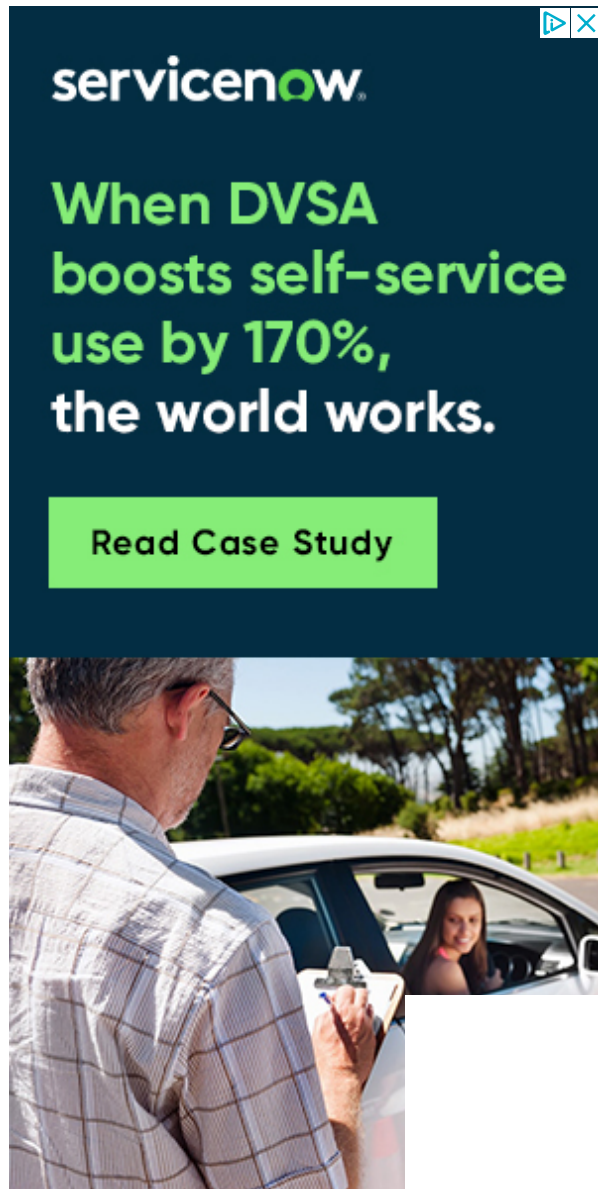
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