

[Home](#) > [Java 8](#)

Java 8 Stream reduce() Example

By Arvind Rai, September 26, 2016

On this page we will provide java 8 Stream reduce() example. It is used to get the sum of numbers stored in List, Array etc. It can also concatenate the string stored in [List](#) and [Array](#) etc. Java 8 lambda [Stream.reduce\(\)](#) method can perform many more reducing task as required. We are providing here some usability of [Stream.reduce\(\)](#). Find the examples.

Contents

- [Stream.reduce\(\) with Accumulator](#)
- [Stream.reduce\(\) with Identity and Accumulator](#)
- [Stream.reduce\(\) with Identity, Accumulator and Combiner](#)
- [Reduce List and Array into a String](#)
- [Reduce List and Array into Sum](#)

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Stream.reduce() with Accumulator

Here we will pass [BinaryOperator](#) as accumulator. In case of numeric [BinaryOperator](#), the start value will be 0. In case of string, the start value will be a blank string.

[reduce\(BinaryOperator accumulator\)](#)

The method will return [Optional](#) instance. Find the example.

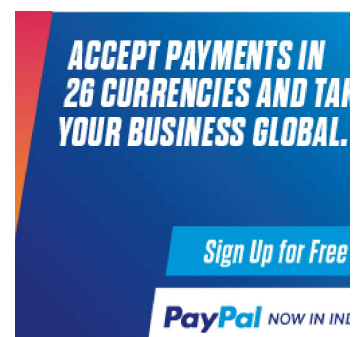
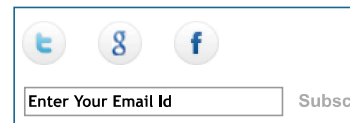
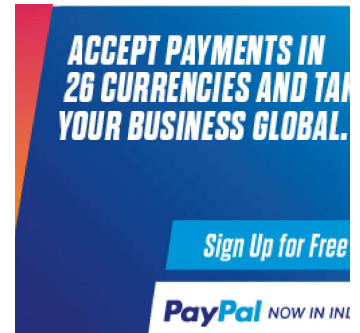
ReduceDemo1.java

```
package com.concretepage;
import java.util.Arrays;
public class ReduceDemo1 {
    public static void main(String[] args) {
        int[] array = {23,43,56,97,32};
        Arrays.stream(array).reduce((x,y) -> x+y).ifPresent(s -> System.out.println(s));
        Arrays.stream(array).reduce(Integer::sum).ifPresent(s -> System.out.println(s));
        Arrays.stream(array).reduce(StatisticsUtility::addIntData).ifPresent(s -> System.out.print
    }
}
```

StatisticsUtility.java

```
package com.concretepage;
public class StatisticsUtility {
    public static int addIntData(int num1, int num2) {
        return num1 + num2;
    }
}
```

Output



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Stream.reduce() with Identity and Accumulator

Here will use an identity and accumulator. We will pass the identity as start value.

```
reduce(T identity, BinaryOperator<T> accumulator)
```

Find the example.

ReduceDemo2.java

```
package com.concretepage;
import java.util.Arrays;
public class ReduceDemo2 {
    public static void main(String[] args) {
        int[] array = {23,43,56,97,32};
        //Set start value. Result will be start value + sum of array.
        int startValue = 100;
        int sum = Arrays.stream(array).reduce(startValue, (x,y) -> x+y);
        System.out.println(sum);
        sum = Arrays.stream(array).reduce(startValue, Integer::sum);
        System.out.println(sum);
        sum = Arrays.stream(array).reduce(startValue, StatisticsUtility::addIntData);
        System.out.println(sum);
    }
}
```

Output

351
351
351

Stream.reduce() with Identity, Accumulator and Combiner

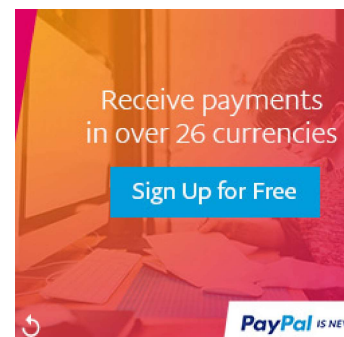
Here we will pass three arguments identity, accumulator and combiner in `reduce()` method. This method with these three arguments is used in parallel processing. Combiner works with parallel stream only, otherwise there is nothing to combine.

```
reduce(U identity, BiFunction<U,? super T,U> accumulator, BinaryOperator<U> combiner)
```

Find the example.

ReduceDemo3.java

```
package com.concretepage;
import java.util.Arrays;
import java.util.List;
public class ReduceDemo3 {
```



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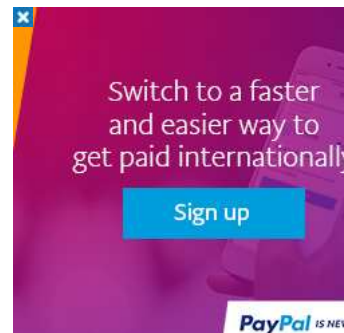
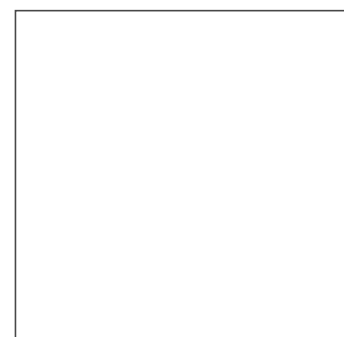
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```

public static void main(String[] args) {
    List<Integer> list2 = Arrays.asList(2, 3, 4);
    //Here result will be 2*2 + 2*3 + 2*4 that is 18.
    int res = list2.parallelStream().reduce(2, (s1, s2) -> s1 * s2, (p, q) -> p + q);
    System.out.println(res);

    List<String> list1 = Arrays.asList("Mohan", "Sohan", "Ramesh");
    String result = list1.parallelStream().reduce("-", (s1, s2) -> s1 + s2, (p, q) -> p + q);
    System.out.println(result);
}
}

```

Output

```

18
-Mohan-Sohan-Ramesh

```

Reduce List and Array into a String

ReduceToString.java

```

package com.concretepage;
import java.util.Arrays;
import java.util.List;
public class ReduceToString {
    public static void main(String[] args) {
        //Reduce Array to String.
        String[] array = {"Mohan", "Sohan", "Mahesh"};
        Arrays.stream(array).reduce((x, y) -> x + "," + y)
            .ifPresent(s -> System.out.println("Array to String: " + s));
        //Reduce List to String.
        List<String> list = Arrays.asList("Mohan", "Sohan", "Mahesh");
        list.stream().reduce((x, y) -> x + "," + y)
            .ifPresent(s -> System.out.println("List to String: " + s));
    }
}

```

Output

```

Array to String: Mohan,Sohan,Mahesh
List to String: Mohan,Sohan,Mahesh

```

Reduce List and Array into Sum

ReduceToSum.java

```

package com.concretepage;
import java.util.Arrays;
import java.util.List;
public class ReduceToSum {
    public static void main(String[] args) {
        //Reduce Array to sum.
        int[] array = {30, 10, 20, 40};
        int sum = Arrays.stream(array).reduce(0, (x, y) -> x + y);
        System.out.println("Sum of Array: " + sum);
        //Reduce List to sum.
        List<Integer> list = Arrays.asList(30, 10, 20, 40);
        sum = list.stream().reduce(0, (x, y) -> x + y);
        System.out.println("Sum of List: " + sum);
    }
}

```

Output

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Sum of Array: 100

Sum of List: 100

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