Key Transforming Operators in the Observable Class (Part 1)

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Learning Objectives in this Part of the Lesson

- Recognize key operators defined in—or used with—Observables
  - Factory method operators
  - Transforming operators
    - Transform the values and/ or types emitted by an Observable
      - e.g., map()

Key Transforming Operators in the Observable Class

Key Transforming Operators in the Observable Class

- The map() operator
  - Transform the item(s) emitted by this Observable

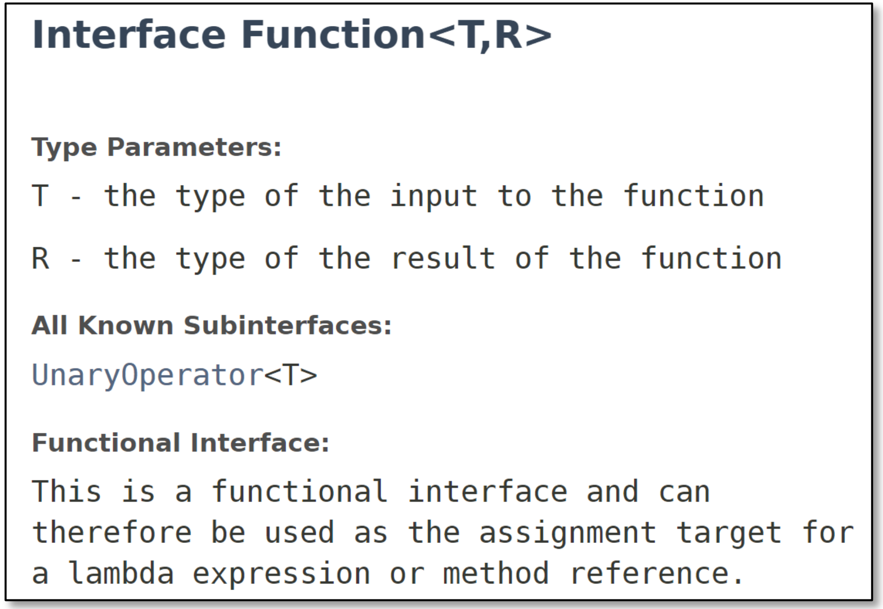
```
<V> Observable<V> map
   (Function<? super T,? extends V>
    mapper)
```

See reactivex.io/RxJava/3.x/javadoc/io/reactivex/rxjava3/core/Observable.html#map

Key Transforming Operators in the Observable Class

- The map() operator
  - Transform the item(s) emitted by this Observable
    - Applies a synchronous function to transform each item

```
<V> Observable<V> map
  (Function<? super T,? extends V>
   mapper)
```



Interface Function<T,R>

Type Parameters:

T - the type of the input to the function

R - the type of the result of the function

All Known Subinterfaces:

UnaryOperator<T>

Functional Interface:

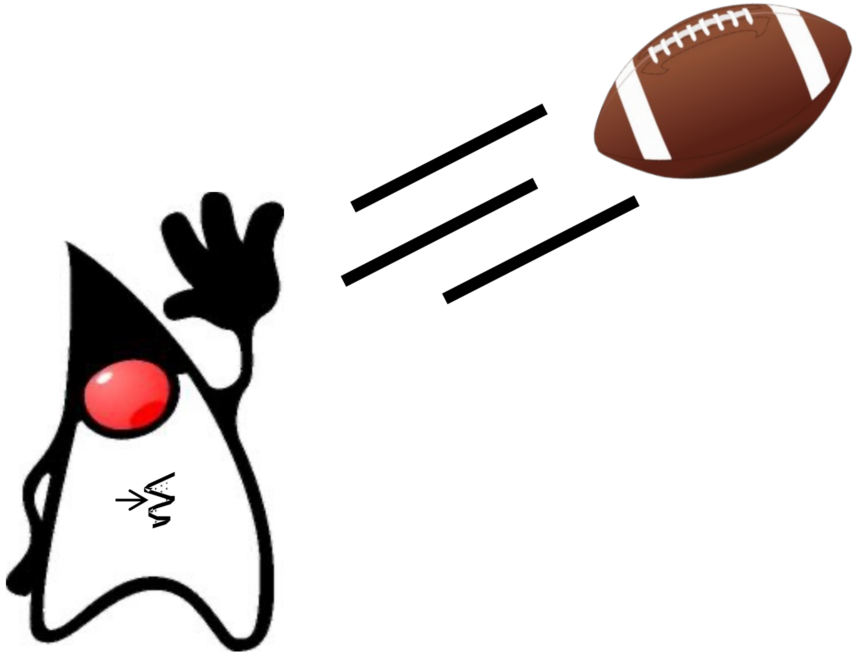
This is a functional interface and can therefore be used as the assignment target for a lambda expression or method reference.

See reactivex.io/RxJava/3.x/javadoc/io/reactivex/rxjava3/functions/Function.html

Key Transforming Operators in the Observable Class

- The map() operator
  - Transform the item(s) emitted by this Observable
    - Applies a synchronous function to transform each item
      - map() can terminate if mapper throws an exception

```
<V> Observable<V> map
  (Function<? super T,? extends V>
   mapper)
```



Key Transforming Operators in the Observable Class

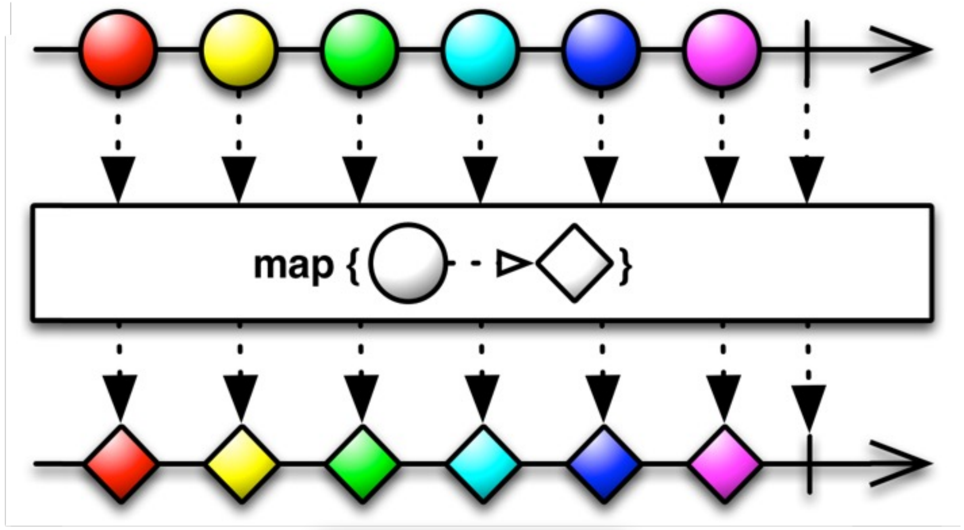
- The map() operator
  - Transform the item(s) emitted by this Observable
    - Applies a synchronous function to transform each item
    - Returns a transformed Observable

```
<V> Observable<V> map
  (Function<? super T,? extends V>
   mapper)
```

Key Transforming Operators in the Observable Class

- The map() operator
  - Transform the item(s) emitted by this Observable
  - The # of output items must match the # of input items

```
Observable
   .fromIterable
     (bigFractionList)
   ...
   .map(fraction -> fraction
            .multiply(sBigReducedFrac))
   ...
```

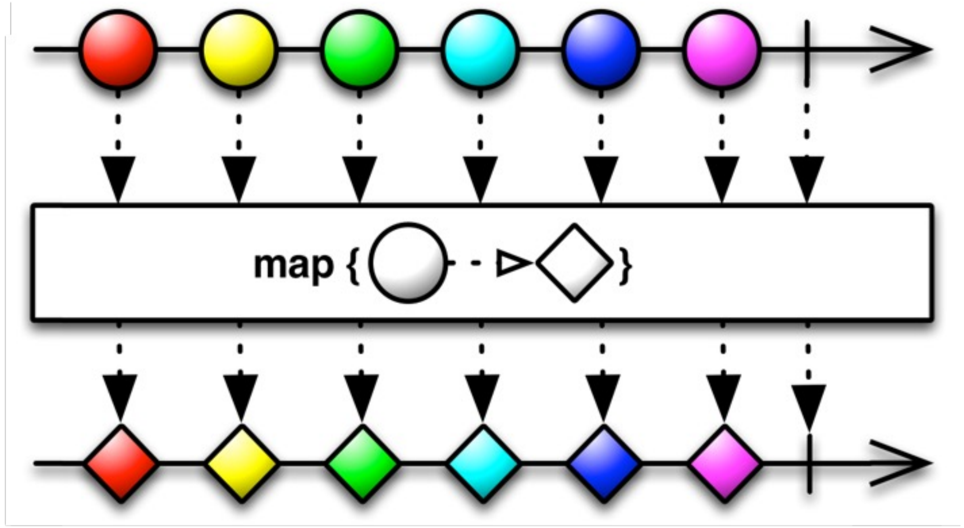


Multiply each element in the Observable stream by a constant

See Reactive/Observable/ex1/src/main/java/ObservableEx.java

Key Transforming Operators in the Observable Class

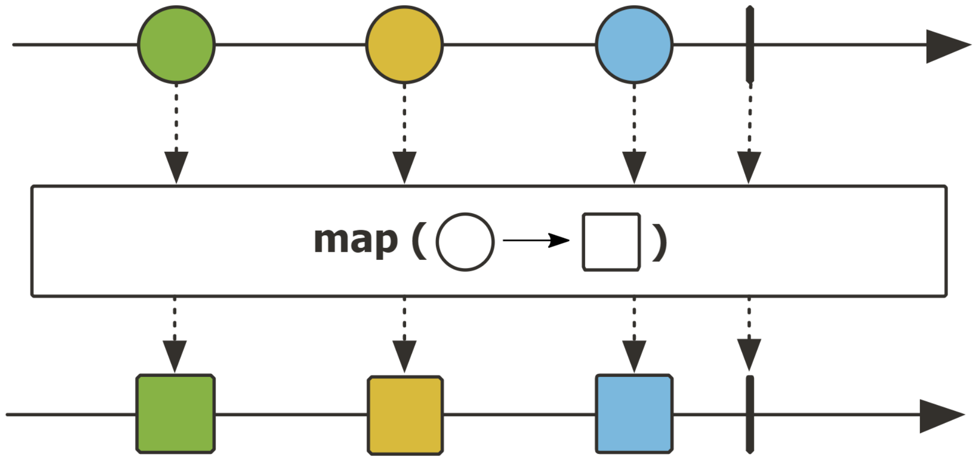
- The map() operator
  - Transform the item(s) emitted by this Observable
  - The # of output items must match the # of input items
    - map() can transform the type and/or value of elements it processes



Key Transforming Operators in the Observable Class

- The map() operator
  - Transform the item(s) emitted by this Observable
  - The # of output items must match the # of input items
  - Project Reactor's Flux.map() operator works the same

```
Flux
   .fromIterable
     (bigFractionList)
   ...
   .map(fraction -> fraction
          .multiply(sBigReducedFrac))
   ...
```

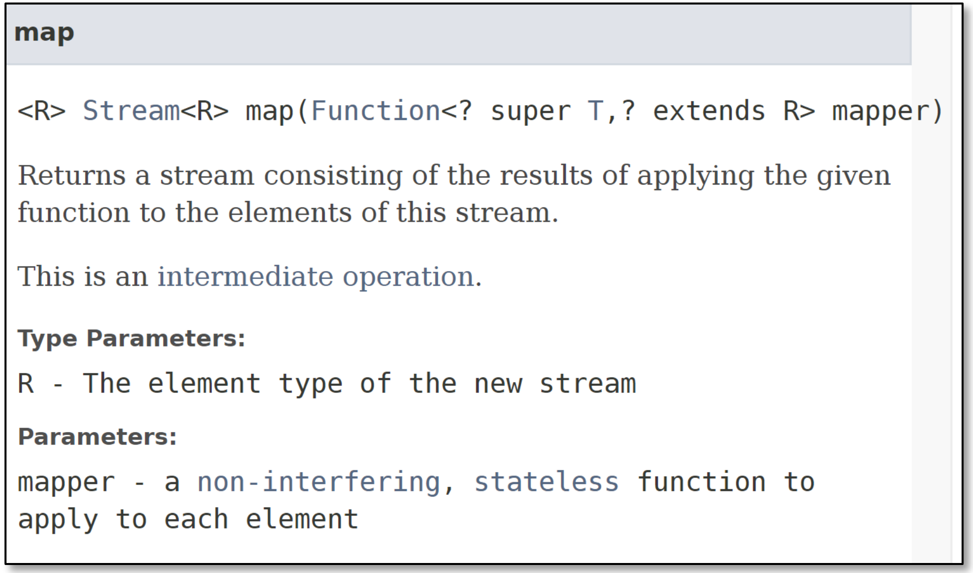


Multiply each element in the Flux stream by a constant

See projectreactor.io/docs/core/release/api/reactor/core/publisher/Flux.html#map

Key Transforming Operators in the Observable Class

- The map() operator
  - Transform the item(s) emitted by this Observable
  - The # of output items must match the # of input items
  - Project Reactor's Flux.map() operator works the same
  - Similar to Stream.map() method in Java Streams



map

`<R> Stream<R> map(Function<? super T,? extends R> mapper)`

Returns a stream consisting of the results of applying the given function to the elements of this stream.

This is an intermediate operation.

Type Parameters:

`R - The element type of the new stream`

Parameters:

`mapper - a non-interfering, stateless function to apply to each element`

```
List<String> collect = List
   .of("a", "b", "c").stream()
   .map(String::toUpperCase).toList();
```

Uppercase each string in a stream

See docs.oracle.com/javase/8/docs/api/java/util/stream/Stream.html#map

End of Key Transforming Operators in the Observable Class (Part 1)