Overview of Java Streams
Terminal Operations

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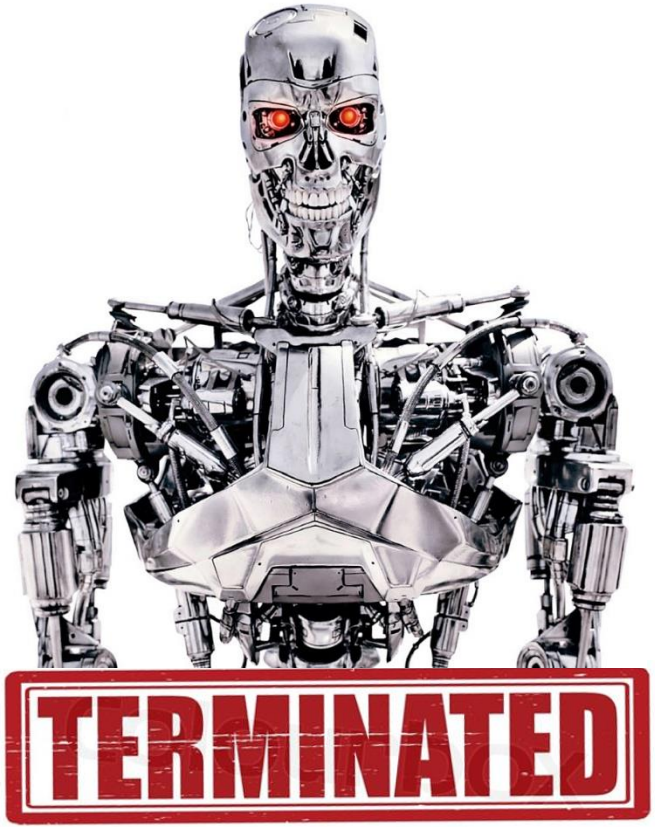
Learning Objectives in this Part of the Lesson

- Understand the structure & functionality of stream terminal operations



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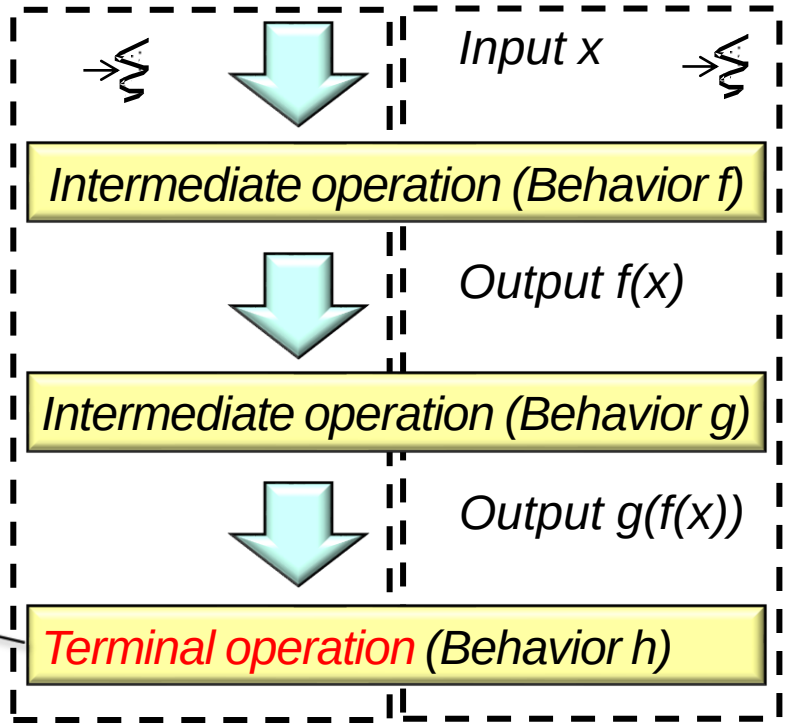

These operations also apply to both sequential & parallel streams

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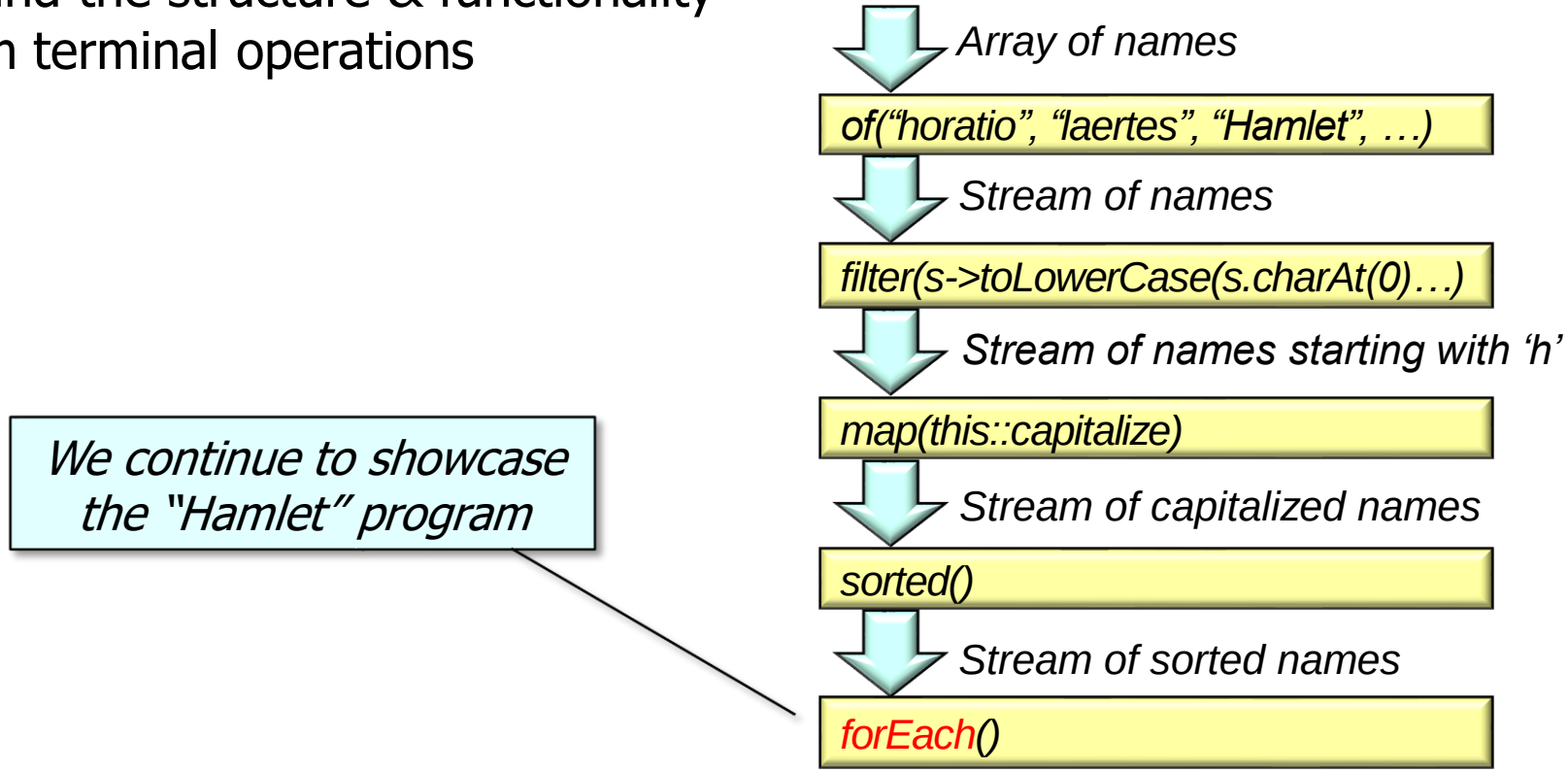
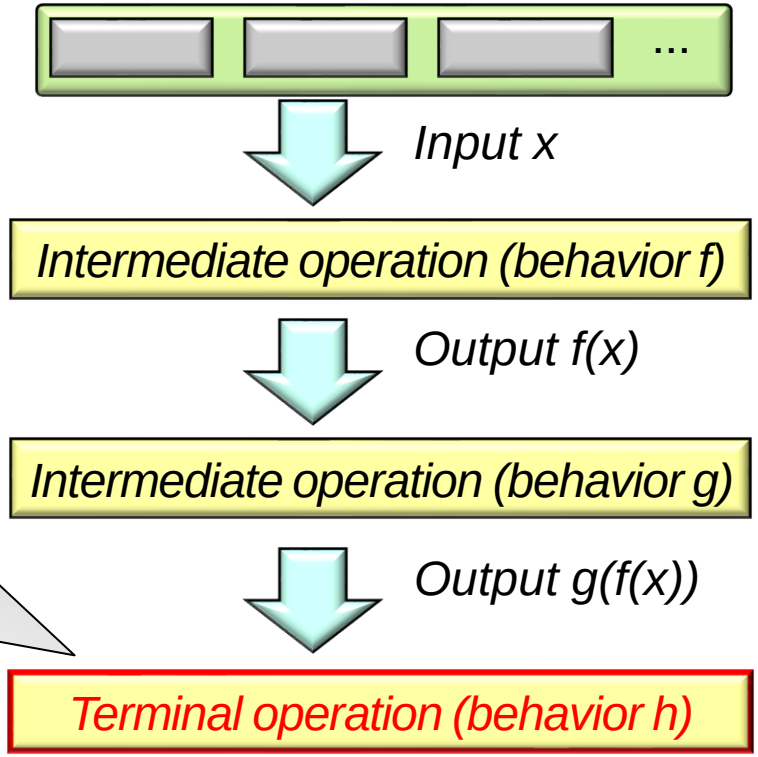


Overview of Terminal Operations

Overview of Common Stream Terminal Operations

- Every stream finishes with a terminal operation that yields a non-stream result


```
Stream
   .of("horatio",
       "laertes",
       "Hamlet", ...)
   .filter(s -> toLowerCase
               (s.charAt(0)) == 'h')
   .map(this::capitalize)
   .sorted()
   .forEach(System.out::println);
```



See github.com/douglascraigschmidt/LiveLessons/tree/master/Java8/ex12

Overview of Common Stream Terminal Operations

- Every stream finishes with a terminal operation that yields a non-stream result, e.g.
  - No value at all
    - e.g., forEach() & forEachOrdered()

forEach() & forEachOrdered() only have side-effects!

Overview of Common Stream Terminal Operations

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```
Stream
   .of("horatio",
       "laertes",
       "Hamlet", ...)
   .filter(s -> toLowerCase
           (s.charAt(0)) == 'h')
   .map(this::capitalize)
   .sorted()
   .forEach
      (System.out::println);
```

Print each character in Hamlet that starts with 'H' or 'h' in consistently capitalized & sorted order.

Overview of Common Stream Terminal Operations

- Every stream finishes with a terminal operation that yields a non-stream result, e.g.
  - No value at all
  - The result of a reduction operation
    - e.g., collect() & reduce()

See docs.oracle.com/javase/tutorial/collections/streams/reduction.html

Overview of Common Stream Terminal Operations

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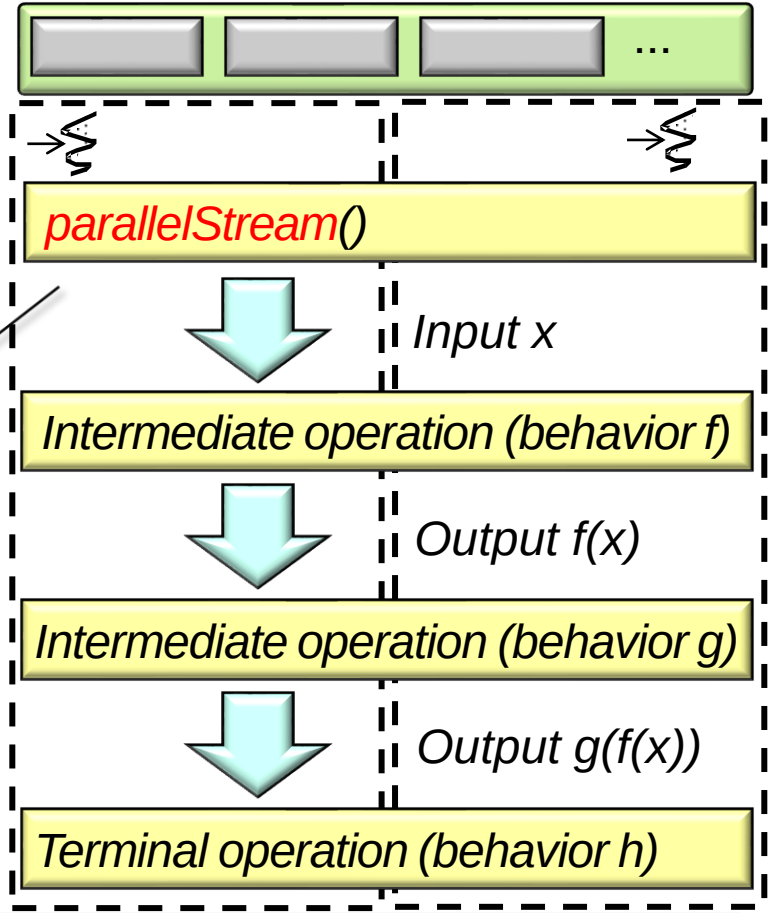
    - e.g., collect() & reduce()

collect() & reduce() terminal operations work seamlessly with parallel streams.



See docs.oracle.com/javase/tutorial/collections/streams/parallelism.html

Overview of Common Stream Terminal Operations

- Every stream finishes with a terminal operation that yields a non-stream result, e.g.
  - No value at all
  - The result of a reduction operation
  - An Optional or boolean value
    - e.g., findAny(), findFirst(), noneMatch(), etc.

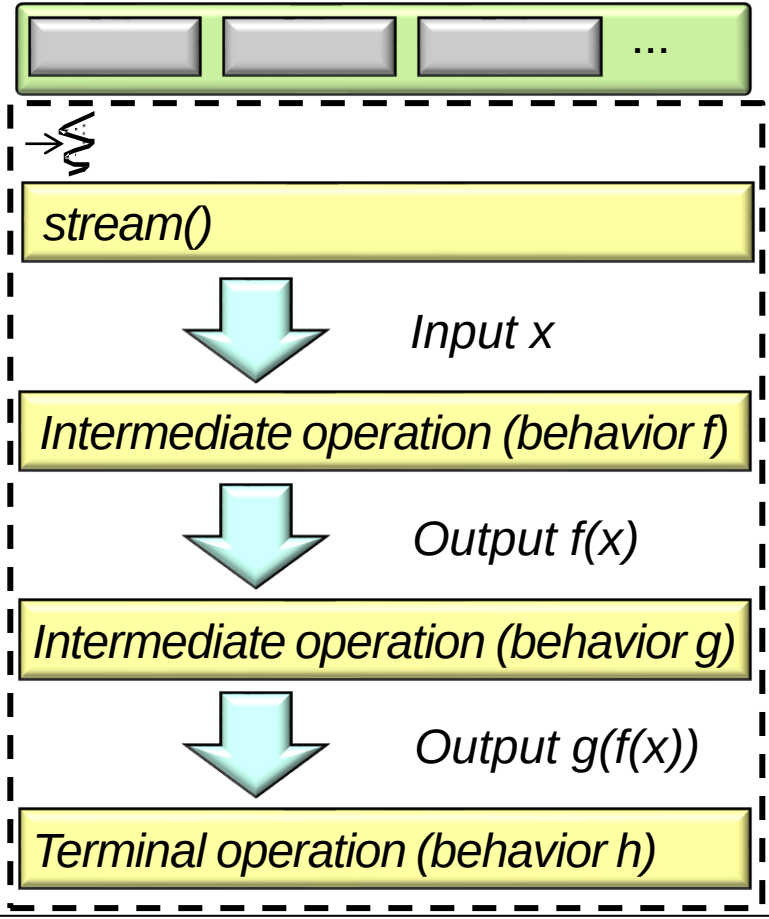
These terminal operations are "short-circuiting"

```
List<String> countries = Arrays
   .asList("france", "india",
           "china", "usa");

print(countries.stream()
   .filter(country -> country
           .contains("i"))
   .findFirst().get());

print(countries.stream()
    .filter(country -> country
            .contains("i"))
    .findAny().get());

print(countries.stream()
    .noneMatch(country -> country
    .contains("z")));
```

See dzone.com/articles/collectors-part-1-%E2%80%93-reductions

Overview of the collect() Terminal Operation

- A terminal operation also triggers all the ("lazy") intermediate operation processing



End of Overview of Java Streams Terminal Operations