

Recognizing Java Streams Benefits

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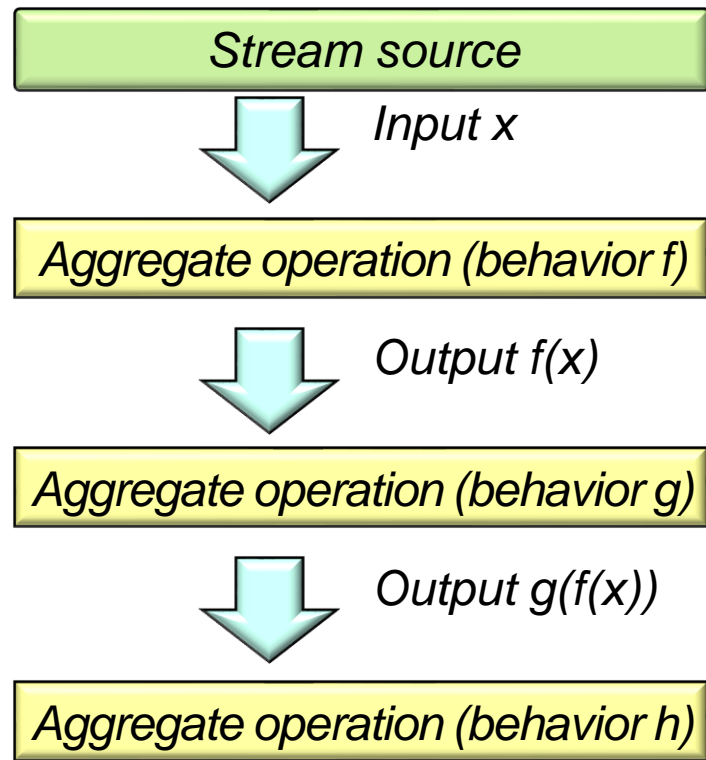
**Institute for Software
Integrated Systems**

**Vanderbilt University
Nashville, Tennessee, USA**



Learning Objectives in this Part of the Lesson

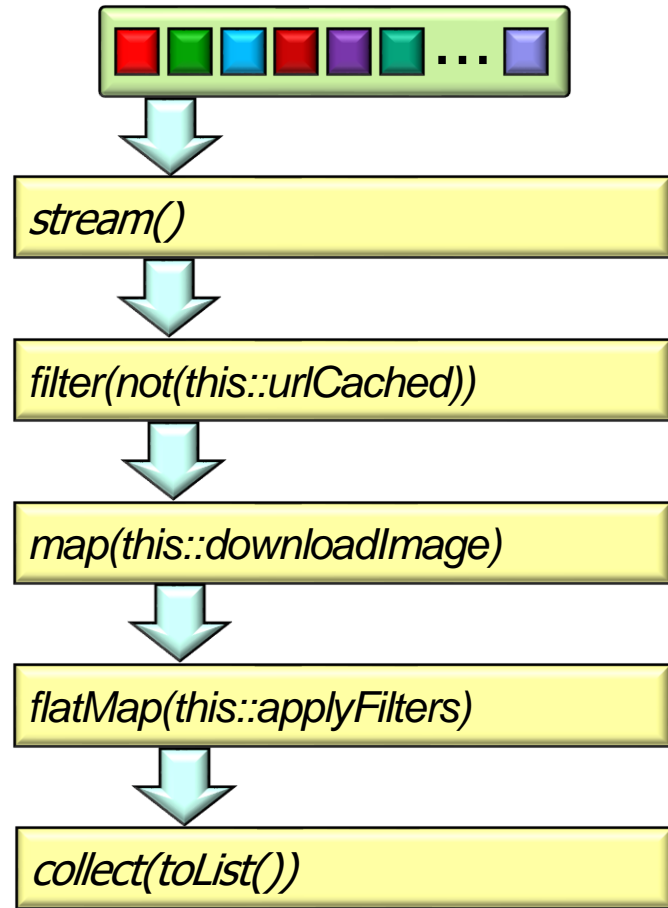
- Understand the structure & functionality of Java streams, e.g.,
 - Fundamentals of streams
 - Benefits of streams
 - Creating a stream
 - Aggregate operations in a stream
 - Applying streams in practice
 - Sequential vs. parallel streams
 - Benefits of streams



Benefits of Java Streams

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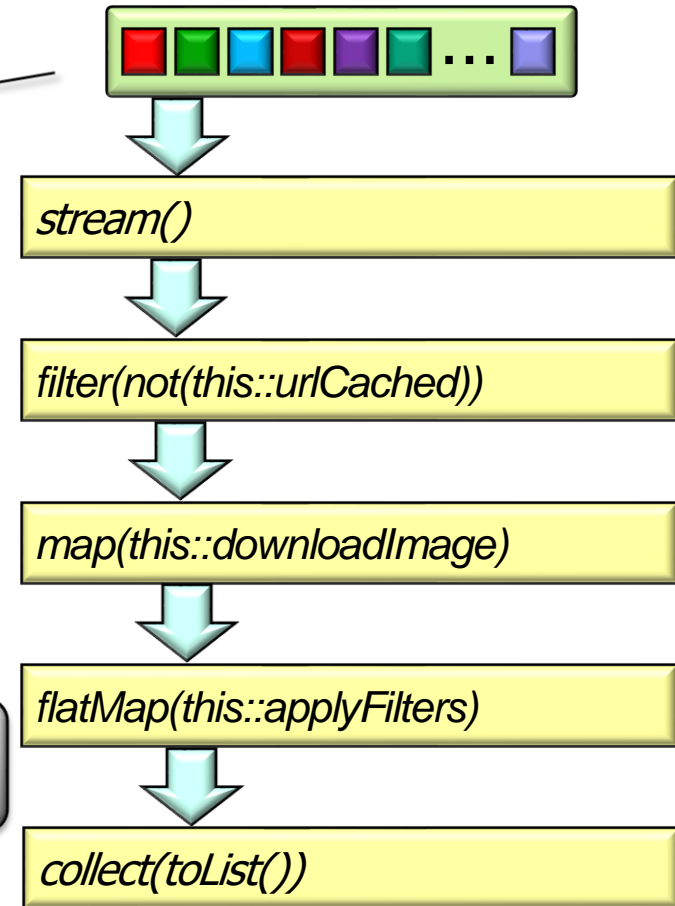
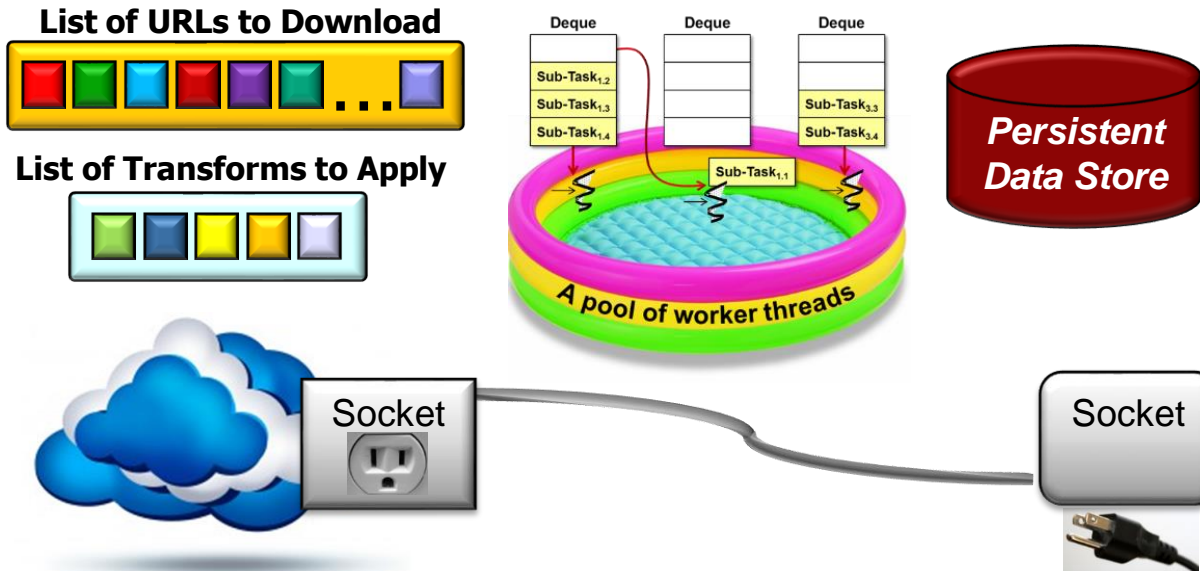
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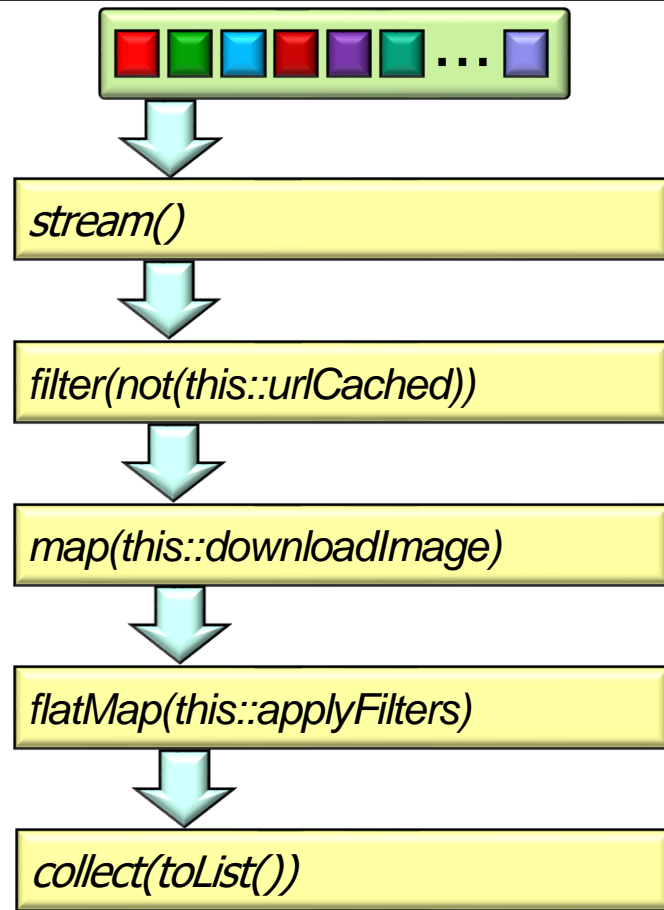
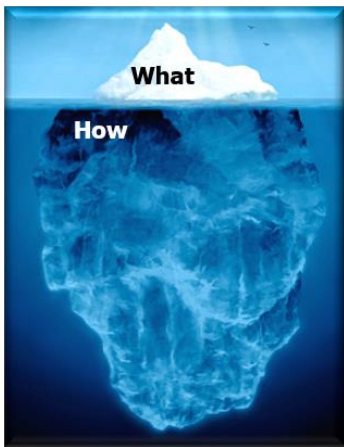
This case study program downloads, transforms, stores, & displays images



See github.com/douglasraigschmidt/LiveLessons/tree/master/ImageStreamGang

Benefits of Java Streams

- Java streams provide several key benefits to programs & programmers, e.g.
 - Concise & readable**
 - Declarative paradigm focuses on *what* functions to perform, not *how* to perform them



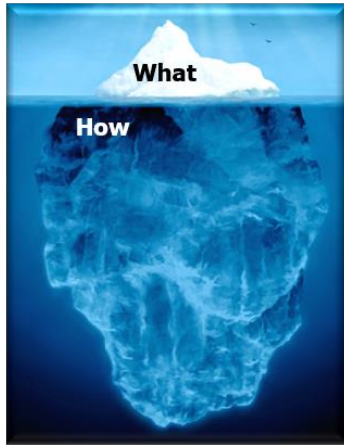
See en.wikipedia.org/wiki/Declarative_programming

Benefits of Java Streams

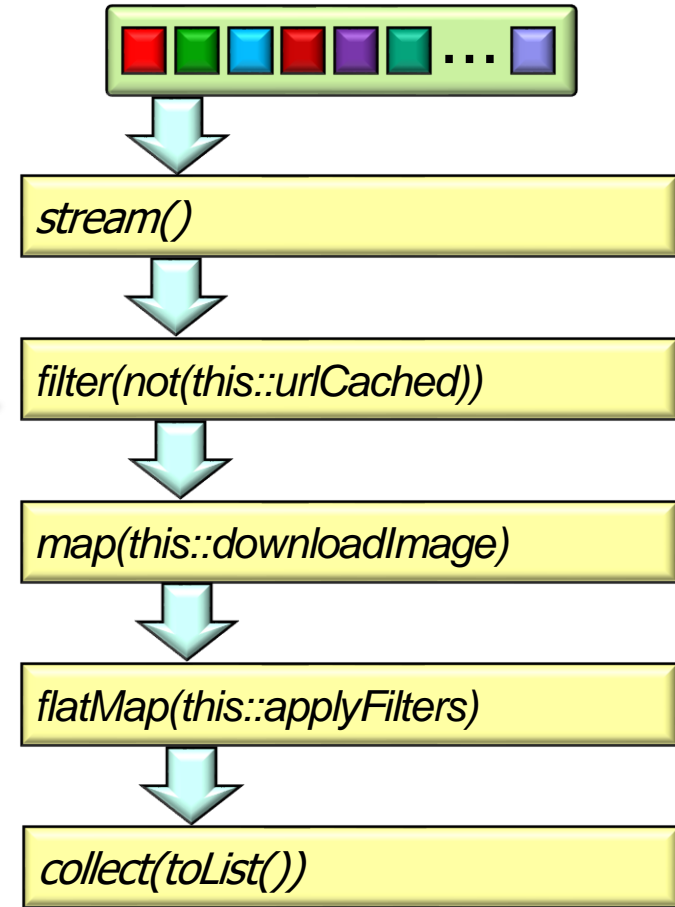
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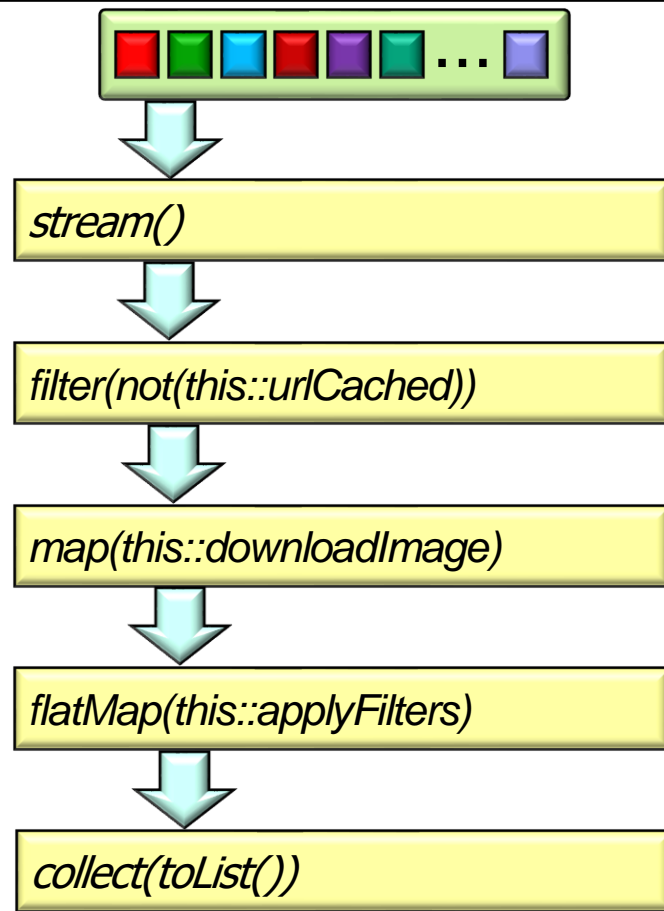
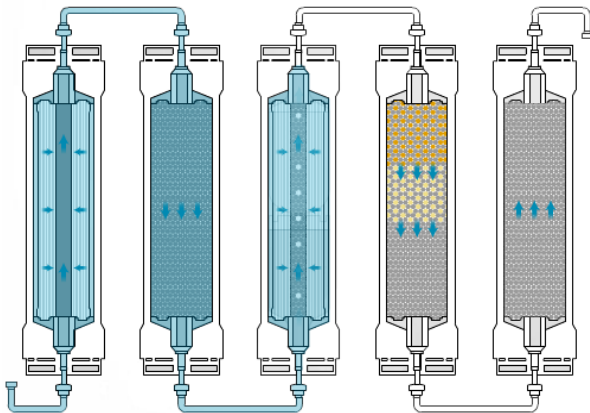
e.g., no Java control-flow operations are applied in this stream



See docs.oracle.com/javase/tutorial/java/nutsandbolts/flow.html

Benefits of Java Streams

- Java streams provide several key benefits to programs & programmers, e.g.
 - **Concise & readable**
 - **Flexible & composable**
 - Functions are automatically connected together



Benefits of Java Streams

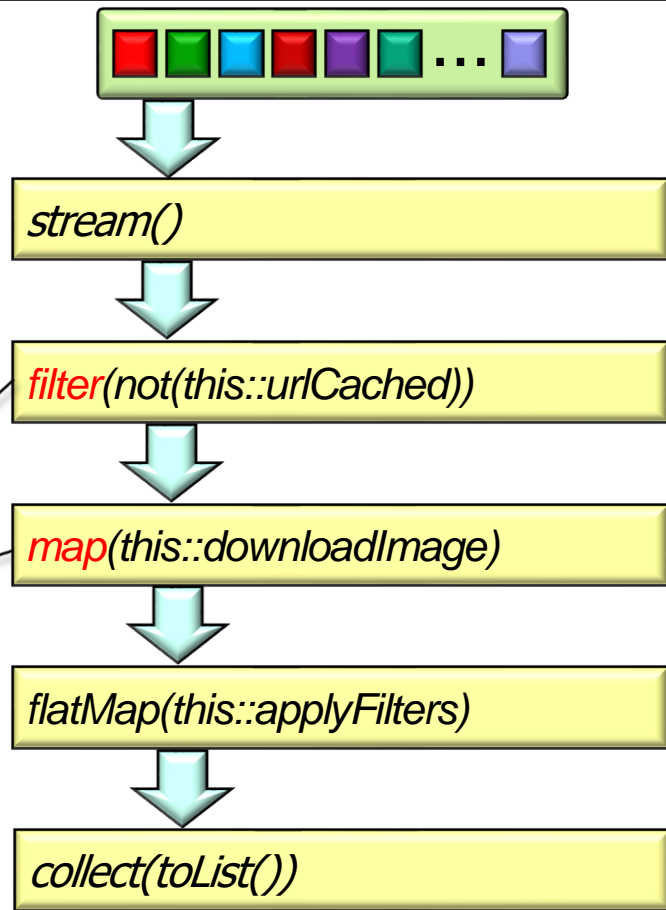
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e.g., the output from `filter()` is passed as the input to `map()` etc.



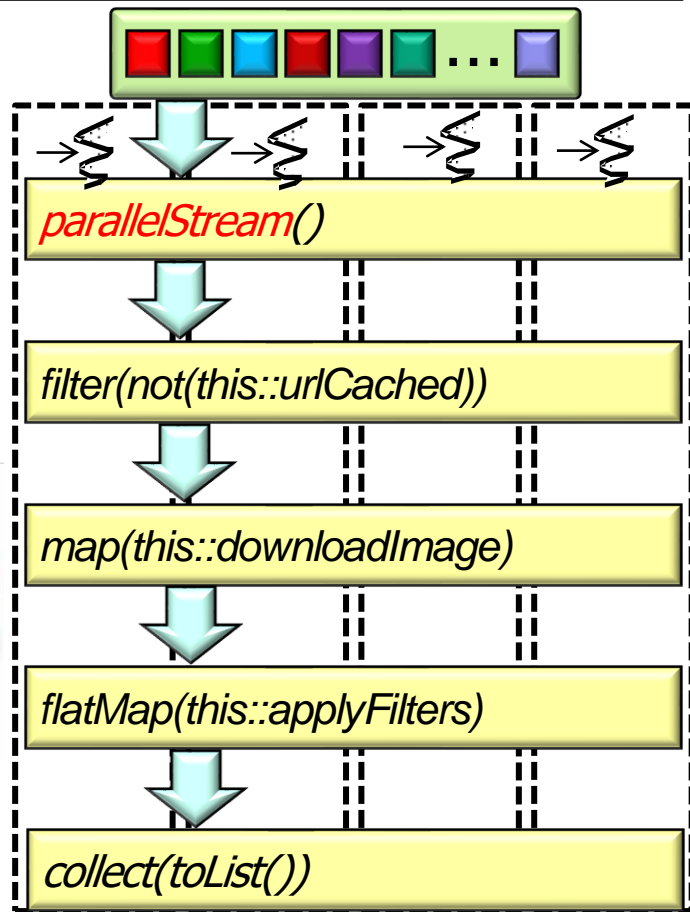
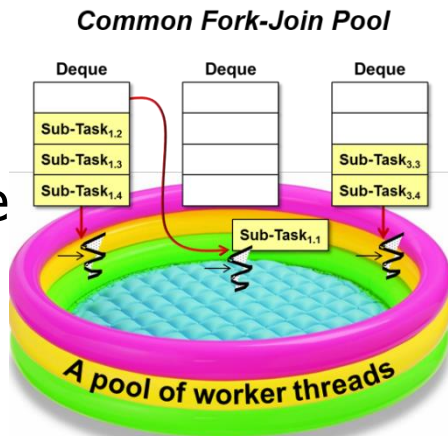
Benefits of Java Streams

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- Concise & readable
- Flexible & composable

- **Simplified scalability**

- Parallelize performance without the need to write any multi-threaded code



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

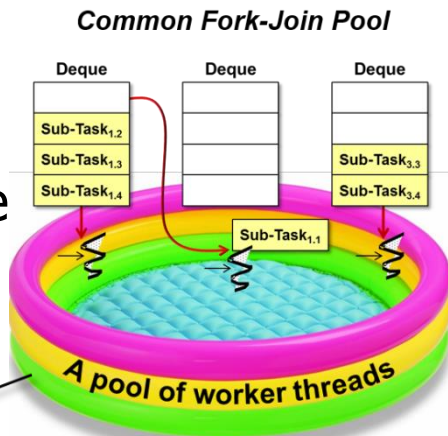
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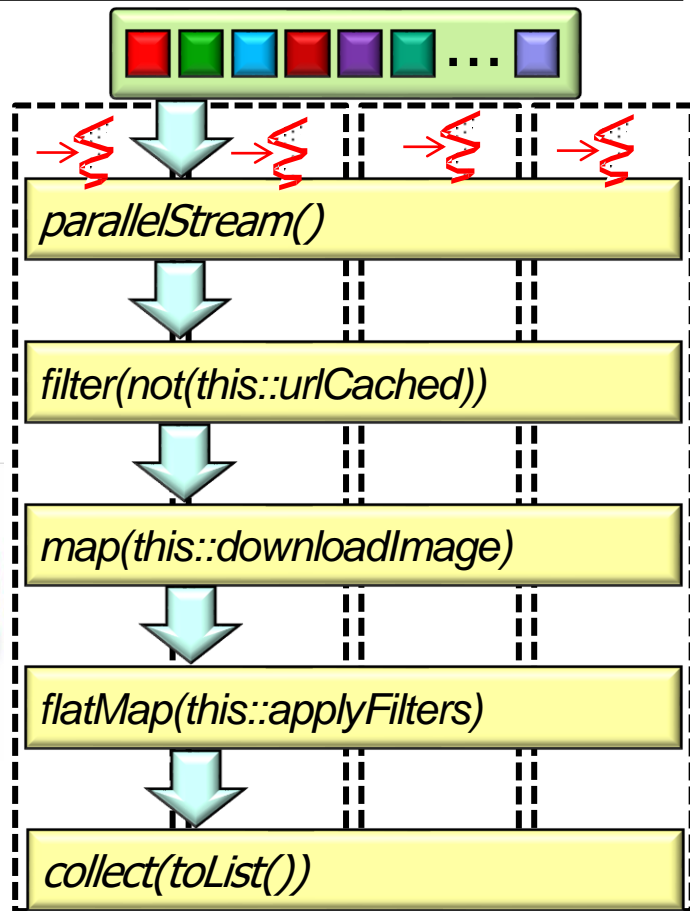
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A pool of worker threads is used to process behaviors in parallel



See dzone.com/articles/common-fork-join-pool-and-streams

Benefits of Java Streams

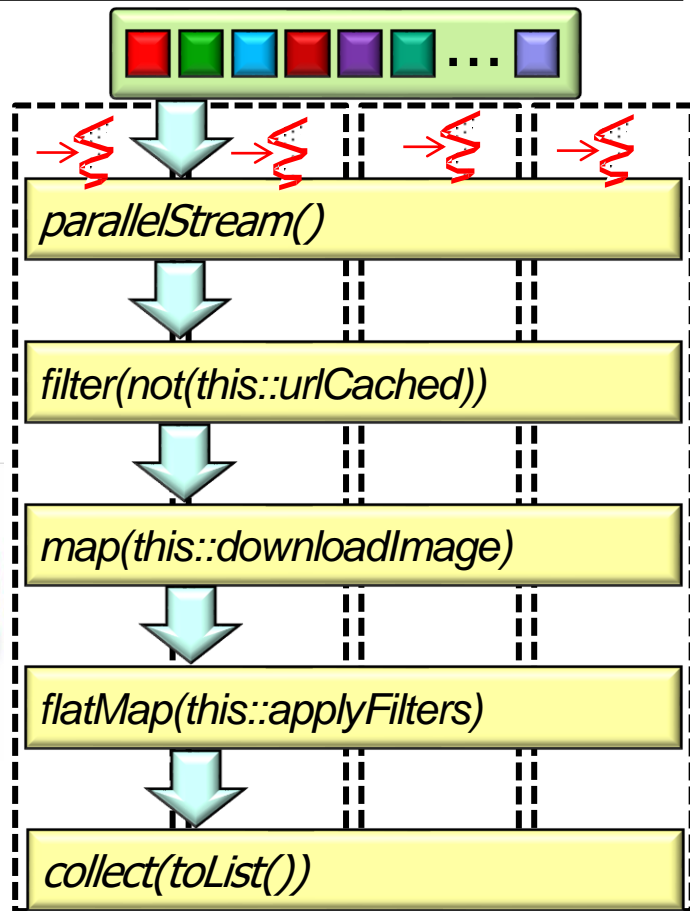
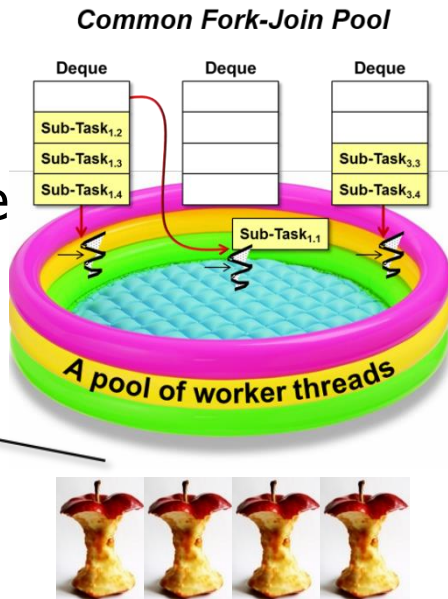
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Data mapped automatically to underlying processor cores



See gee.cs.oswego.edu/dl/papers/fj.pdf

End of Recognizing Java Streams Benefits