Java Parallel Streams Internals: Introduction

Douglas C. Schmidt
d.schmidt@vanderbilt.edu
www.dre.vanderbilt.edu/~schmidt

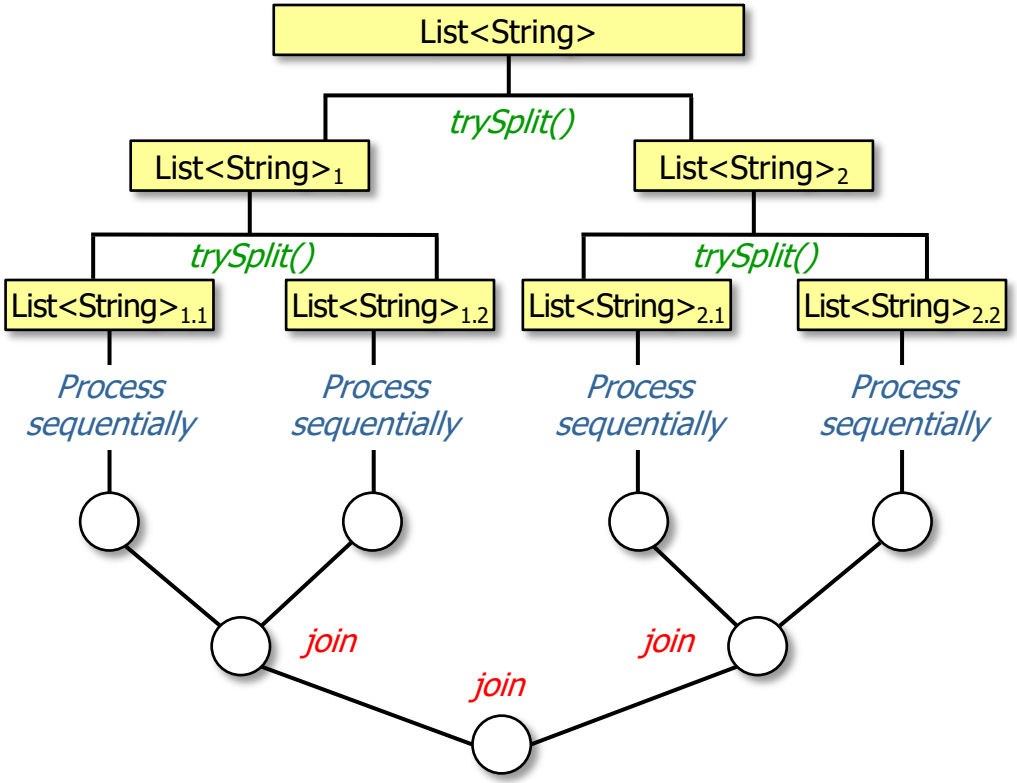
Professor of Computer Science

Institute for Software Integrated Systems

Vanderbilt University
Nashville, Tennessee, USA

Learning Objectives in this Part of the Lesson

- Understand parallel stream internals



See developer.ibm.com/languages/java/articles/j-java-streams-3-brian-goetz

Learning Objectives in this Part of the Lesson

- Understand parallel stream internals, e.g.
  - Know what can change & what can't change wrt splitting, applying, & combining

See en.wikipedia.org/wiki/Serenity_Prayer

Why Knowledge of Parallel Streams Matters

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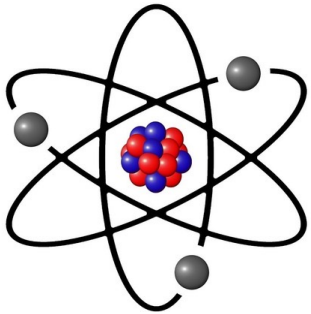
- Converting a Java sequential stream to a parallel stream is usually quite straightforward

Changing stream() calls to parallelStream() calls involves minuscule effort!!



```
List<List<SearchResults>>
                processStream() {
  return getInput()
     .stream()
     .map(this::processInput)
     .collect(toList());
}
```

vs

```
List<List<SearchResults>>
                processStream() {
  return getInput()
     .parallelStream()
     .map(this::processInput)
     .collect(toList());
}
```

See prior lesson on *"Java SearchWithParallelStreams Example"*

Why Knowledge of Parallel Streams Matters

- Converting a Java sequential stream to a parallel stream is usually quite straightforward
  - However, just because creating a parallel stream is easy doesn't mean it's the right thing to do!

```
List<List<SearchResults>>
                processStream() {
  return getInput()
    .stream()
    .map(this::processInput)
    .collect(toList());
}
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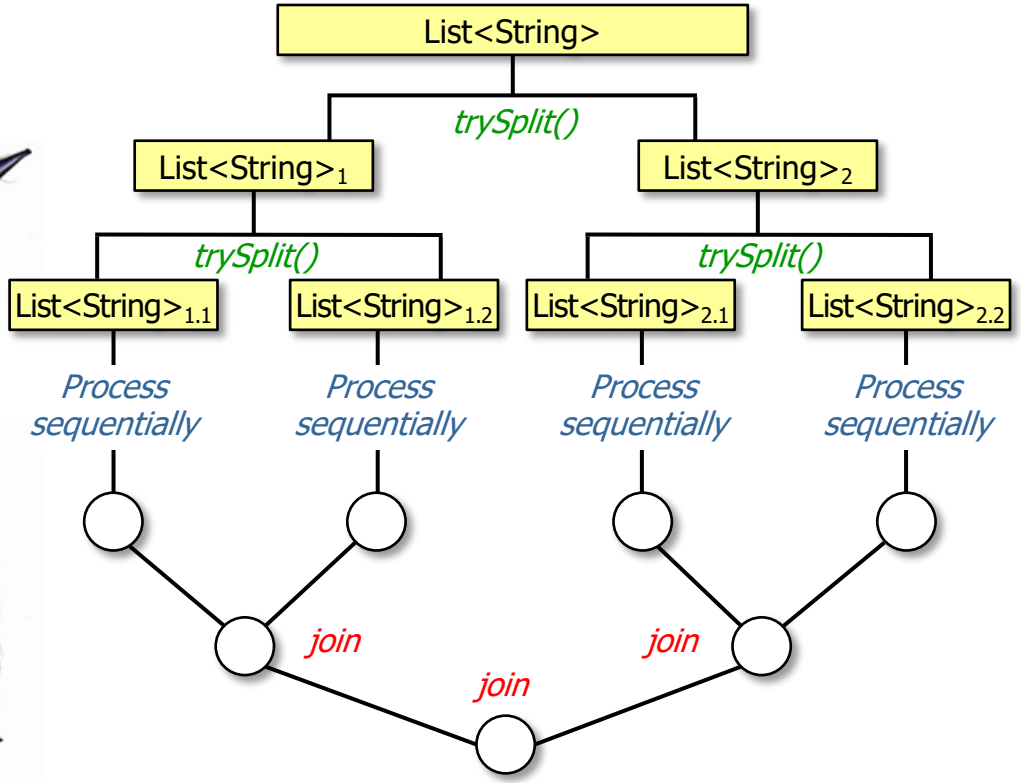
VS

```
List<List<SearchResults>>
                processStream() {
  return getInput()
    .parallelStream()
    .map(this::processInput)
    .collect(toList());
}
```

See upcoming lesson on *"When to Not to Use Java Parallel Streams"*

Why Knowledge of Parallel Streams Matters

- Therefore, knowledge of parallel streams internals will make you a better Java streams programmer!



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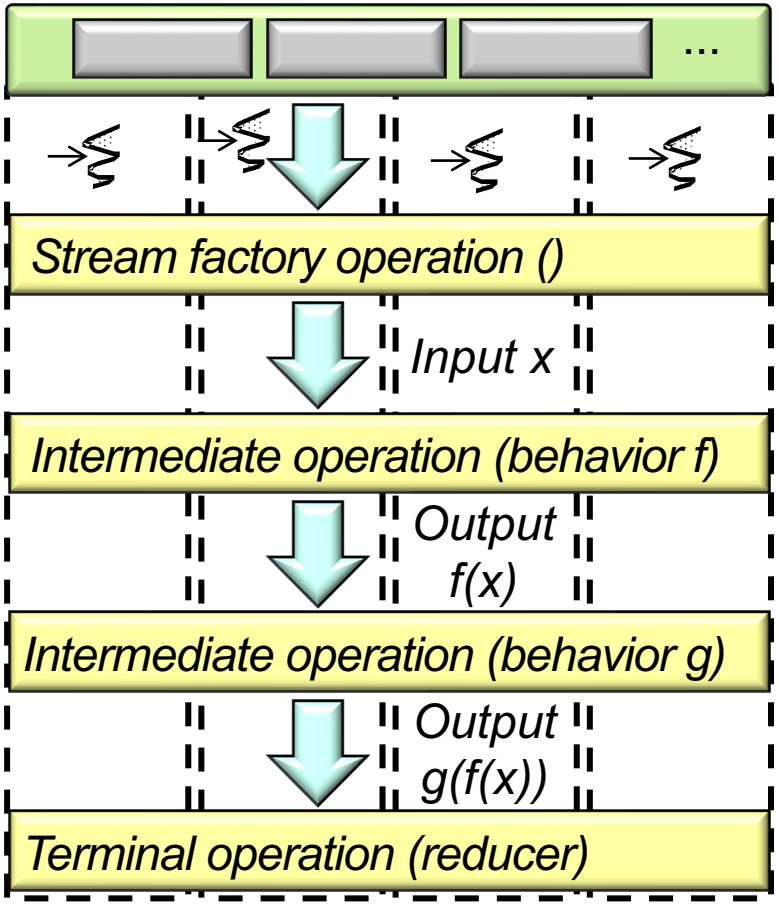
Why Knowledge of Parallel Streams Matters

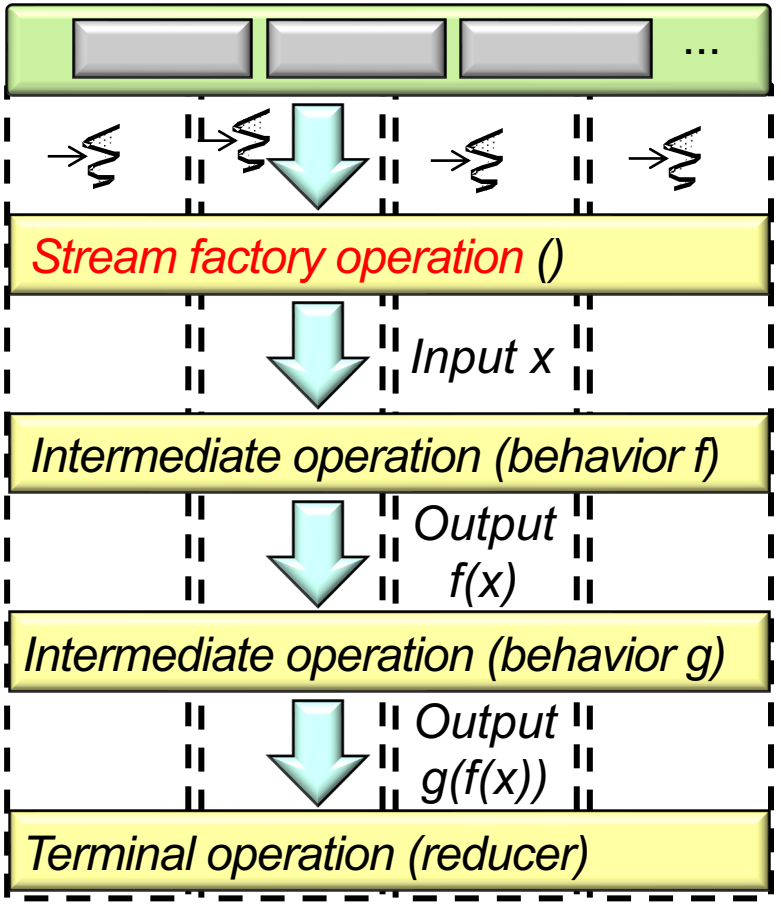
- Recall the 3 phases of a Java parallel stream



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

Why Knowledge of Parallel Streams Matters

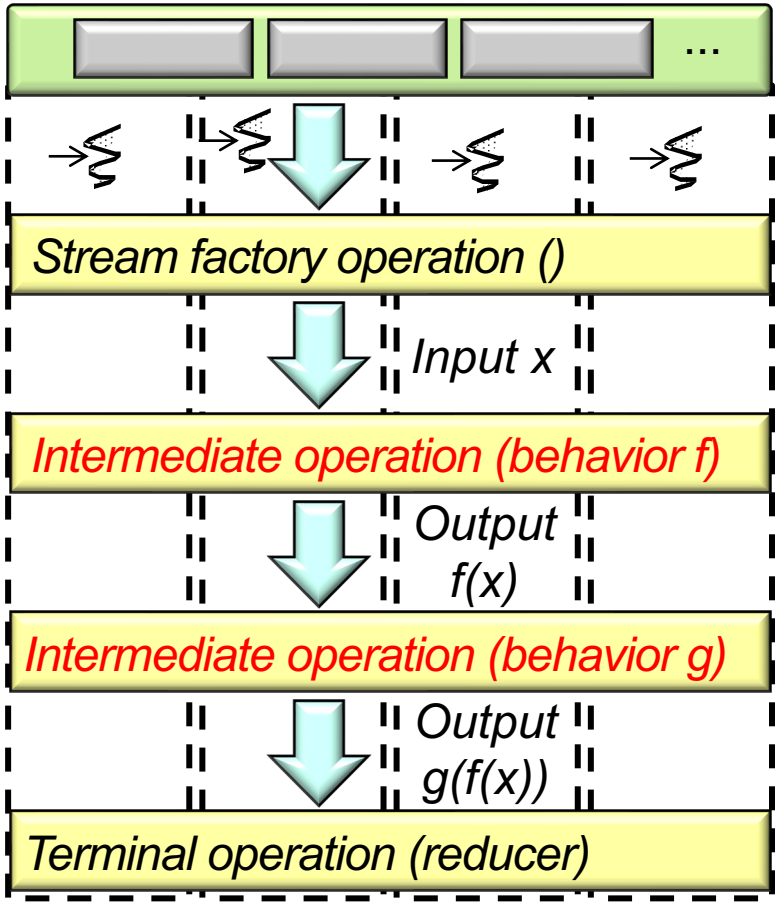
- Recall the 3 phases of a Java parallel stream
  - *Split* – Uses a spliterator to partition a data source into multiple chunks



Programmers have a great degree of control over this phase

Why Knowledge of Parallel Streams Matters

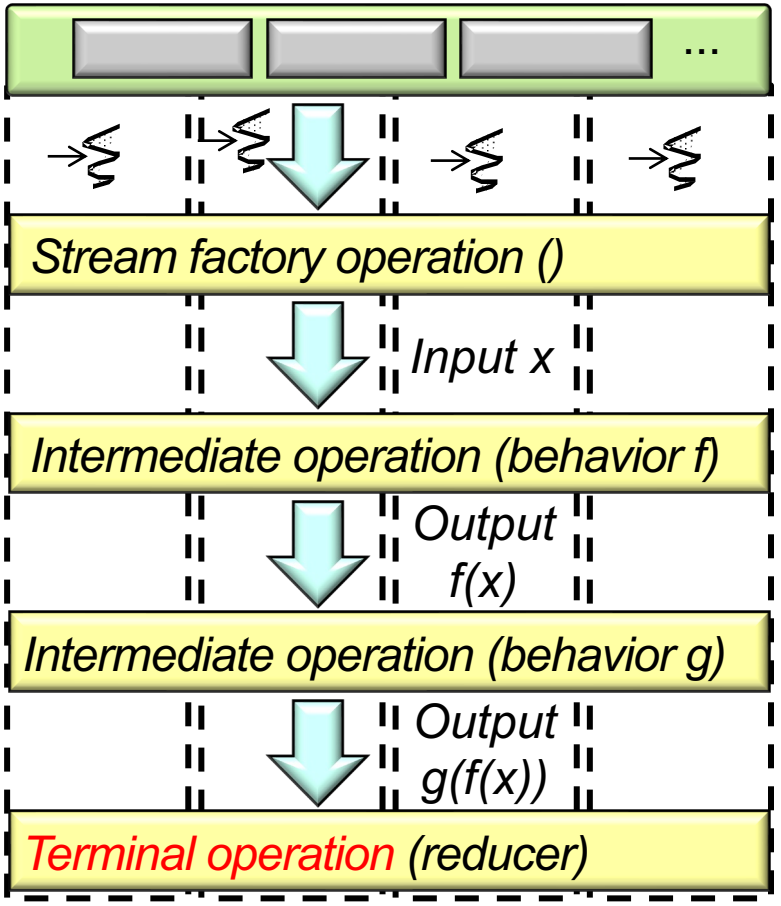
- Recall the 3 phases of a Java parallel stream
  - *Split* – Uses a spliterator to partition a data source into multiple chunks
  - *Apply* – Independently processes these chunks in the common fork-join pool



Programmers have a limited amount of control over this phase

Why Knowledge of Parallel Streams Matters

- Recall the 3 phases of a Java parallel stream
  - *Split* – Uses a spliterator to partition a data source into multiple chunks
  - *Apply* – Independently processes these chunks in the common fork-join pool
  - *Combine* – Joins partial sub-results into a single result



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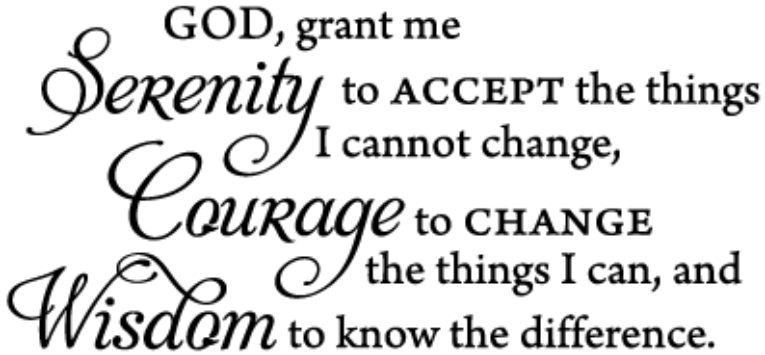

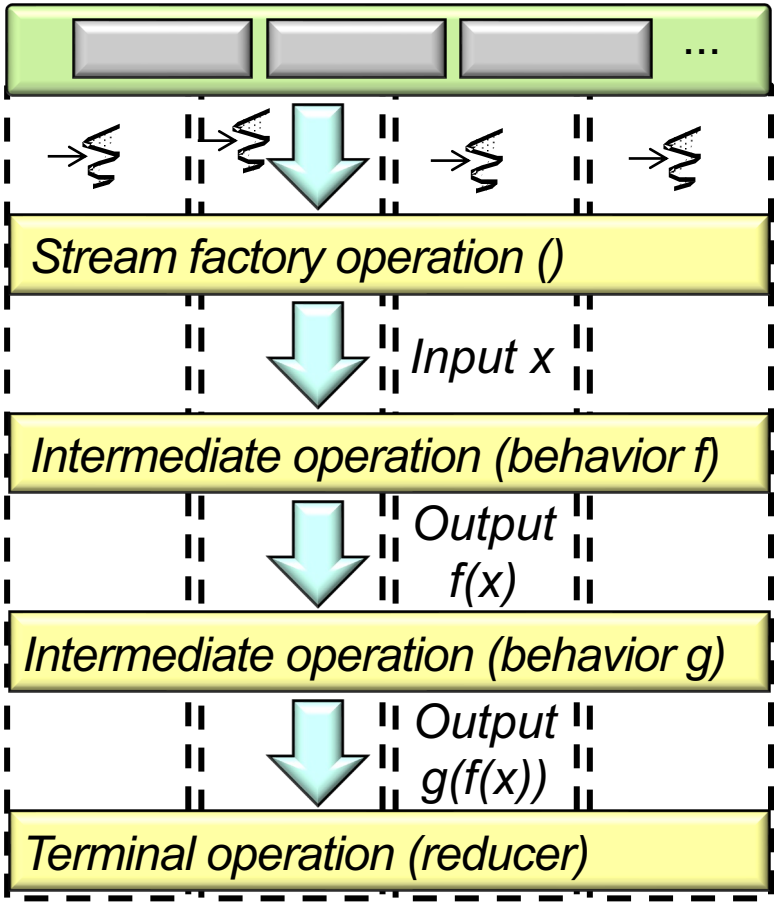

Knowing which phases you can control & which you can't can be very important!

End of Java Parallel Stream Internals: Introduction