Java Parallel Streams Internals: Order of Processing Overview

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Learning Objectives in this Part of the Lesson

• Understand parallel stream internals, e.g.
• Know what can change & what can’t
  • Splitting, combining, & pooling mechanisms
• Order of processing
Java Parallel Stream
Processing Order
Java Parallel Stream Processing Order

- The Java parallel streams framework allows for variability in the order of its processing, while still being deterministic in the processing results.
The order in which chunks in a parallel stream are processed is non-deterministic.

See en.wikipedia.org/wiki/Nondeterministic_algorithm
The order in which chunks in a parallel stream are processed is non-deterministic.

The ordering can exhibit different behaviors on different runs, even for the same input.
- The *order* in which chunks in a parallel stream are processed is non-deterministic.
- Programmers have little/no control over how chunks are processed.
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Non-determinism enables optimizations at multiple layers!

**Java Parallel Stream Processing Order**

- **Applications**
- **Additional Frameworks & Languages**
- **Threading & Synchronization Packages**
- **Java Execution Environment (e.g., JVM)**
- **System Libraries**
- **Operating System Kernel**

E.g., scheduling & execution of tasks via fork-join pool, JVM, hardware cores, etc.
• The order in which chunks in a parallel stream are processed is non-deterministic
  • Programmers have little/no control over how chunks are processed
  • Non-determinism enables optimizations at multiple layers!

*e.g.,* fork-join framework’s support for work-stealing is a non-deterministic optimization

See upcoming lessons on “The Java Fork-Join Framework”
End of Java Parallel Streams Internals: Order of Processing Overview