Contrasting Java 8 Streams with Other Technologies

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Learning Objectives in this Lesson

• Understand how Java 8 streams compare with other technologies
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Contrasting Java 8 Streams with Other Technologies
Overview of Java 8 Streams

- A Java 8 stream is a sequence of data items that are conceptually produced one at a time

```
Input x
```

```
Aggregate operation (behavior f)
```

```
Output f(x)
```

```
Aggregate operation (behavior g)
```

```
Output g(f(x))
```

```
Aggregate operation (behavior h)
```

See docs.oracle.com/javase/tutorial/collectionsstreams
Overview of Java 8 Streams

- A Java 8 stream is a sequence of data items that are conceptually produced one at a time.
- An operation can read items from an input stream one-by-one & also write items to an output stream.

```
Input x
Aggregate operation (behavior f)
Output f(x)
Aggregate operation (behavior g)
Output g(f(x))
Aggregate operation (behavior h)
```

...
Overview of Java 8 Streams

• A Java 8 stream is a sequence of data items that are conceptually produced one at a time

• An operation can read items from an input stream one-by-one & also write items to an output stream

• The output stream of one operation can be the input stream of another
Overview of Java 8 Streams

- A Java 8 stream is an implementation of the POSA Pipes & Filters pattern

Divide an app’s tasks into multiple self-contained data processing steps & connect these steps via intermediate data buffers to form a data processing pipeline

See hillside.net/plop/2011/papers/B-10-Hanmer.pdf
Overview of Java 8 Streams

- There are other common implementations of *Pipes & Filters, e.g.*
- Water purification systems

See [en.wikipedia.org/wiki/Water_filter#Point-of-use_filters](en.wikipedia.org/wiki/Water_filter#Point-of-use_filters)
Overview of Java 8 Streams

- There are other common implementations of *Pipes & Filters*, e.g.
  - Water purification systems
- A pipeline in UNIX command-line shells, e.g.

```bash
find /usr/bin | #produce
sed 's::.*/::' | #strip directory part
grep -i '^z' | #select ‘z*’ names
sort | #sort items
xargs -d '\n' #print as single line
```

Unlike a Java 8 stream, a filter in a UNIX pipeline processes all contents it receives.

See [en.wikipedia.org/wiki/Pipeline_(Unix)](en.wikipedia.org/wiki/Pipeline_(Unix))
Overview of Java 8 Streams

- There are other common implementations of *Pipes & Filters*, e.g.
  - Water purification systems
  - A pipeline in UNIX command-line shells
  - System V STREAMS

See [en.wikipedia.org/wiki/STREAMS](en.wikipedia.org/wiki/STREAMS)
End of Contrasting Java 8 Streams with Other Technologies