DEVOXX™
United Kingdom
the java community conference

Accelerated Lambda Programming

ORACLE®

Stuart Marks
JDK Core Libraries
@stuartmarks

DEVOXX
United Kingdom
the java community conference

Outline

- Lambda is a useful new Java 8 feature
  - Becomes much more useful if there are libraries that use it
- Today's emphasis: the new streams library
- Streams library features illustrated using code examples
- After we dispense with a few slides...

Streams

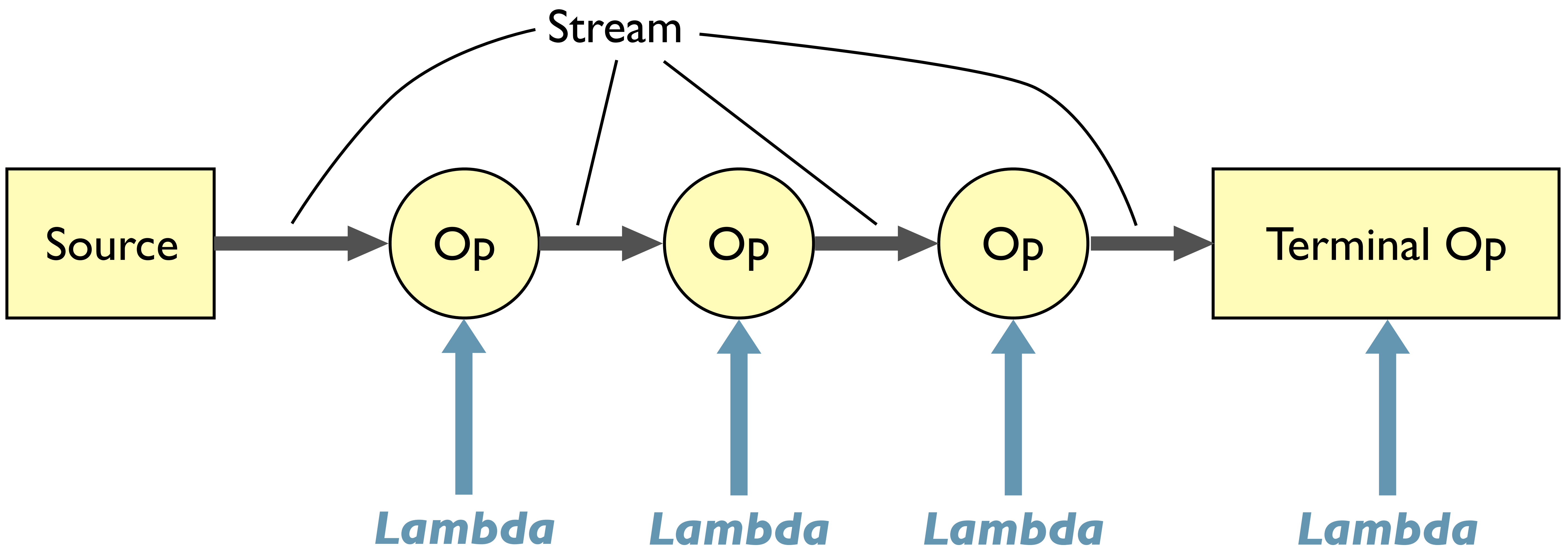
- Stream: an abstraction representing a multiplicity of values
  - Contrast with InputStream/OutputStream: sequence of bytes
- Zero or more, or even unbounded
- Unlike collections, not (necessarily) stored anywhere
- Might or might not be ordered
- Can be sequential or parallel
- Values may be objects or int, long, double primitives
  - Emphasis of objects-as-values over mutation

DEVOXX™
United Kingdom
the java community conference

Pipelines

- A pipeline consists of:
  - A source
  - Zero or more operations
  - A destination (or terminal operation)
- Operations connected by streams
- Laziness-seeking
- Sequential or parallel

How Are Lambdas Involved?



Let's look at some code!

Summation by Mutation

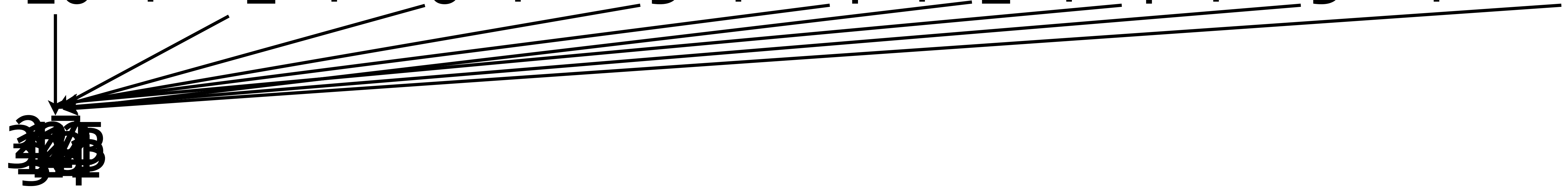
Experience is simply the name we give our mistakes.

$$\begin{tikzcd}
10 \arrow[d] & + & 2 \arrow[dll] & + & 6 & + & 3 & + & 4 & + & 2 & + & 4 & + & 3 & + & 9 \\
12 & & & & & & & & & & & & & & & &
\end{tikzcd}$$

Summation by Mutation

```
Experience is simply the name we give our mistakes.
```

```
10 +  2 +  6 +   3 +  4 + 2 + 4 +  3  +   9
```

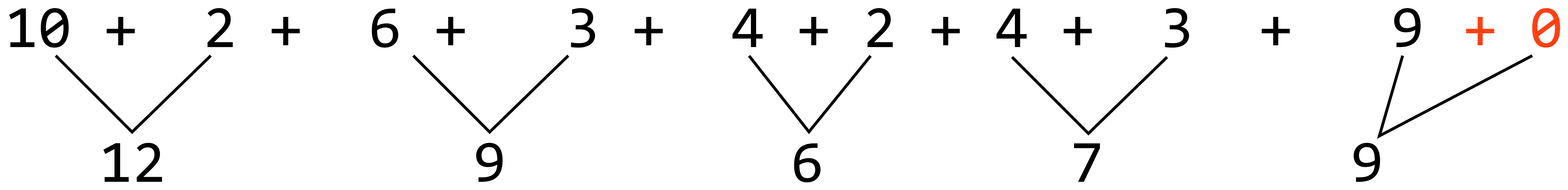


Summation by Reduction

```
Experience is simply the name we give our mistakes.
    10 +  2 +  6 +   3 +  4 + 2 + 4 +  3  +   9
```

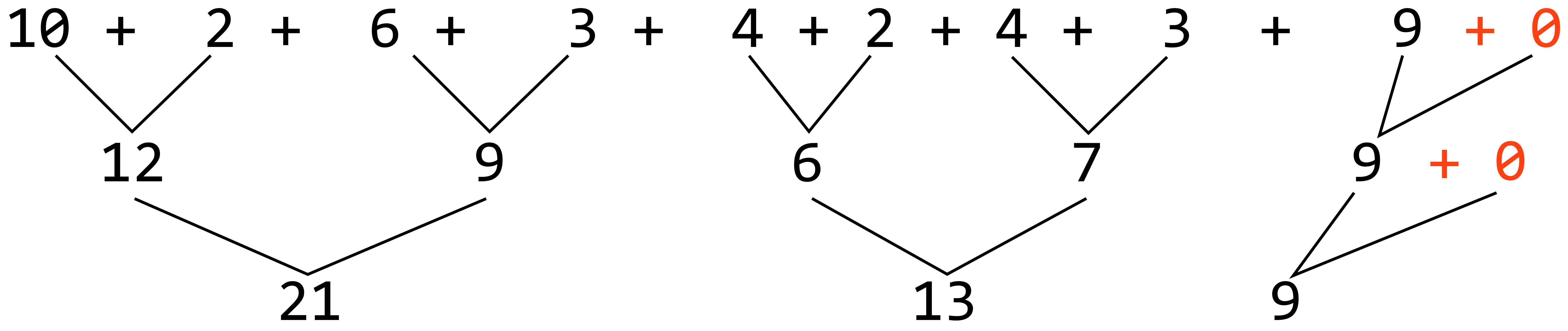
Summation by Reduction

```
Experience is simply the name we give our mistakes.
```



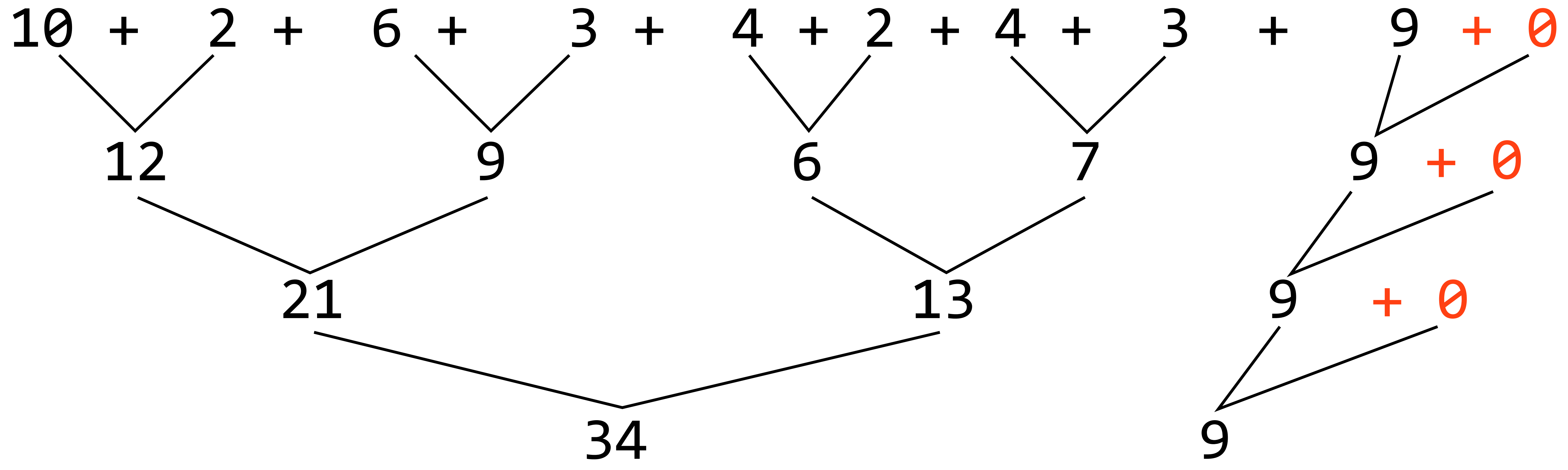
Summation by Reduction

```
Experience is simply the name we give our mistakes.
```



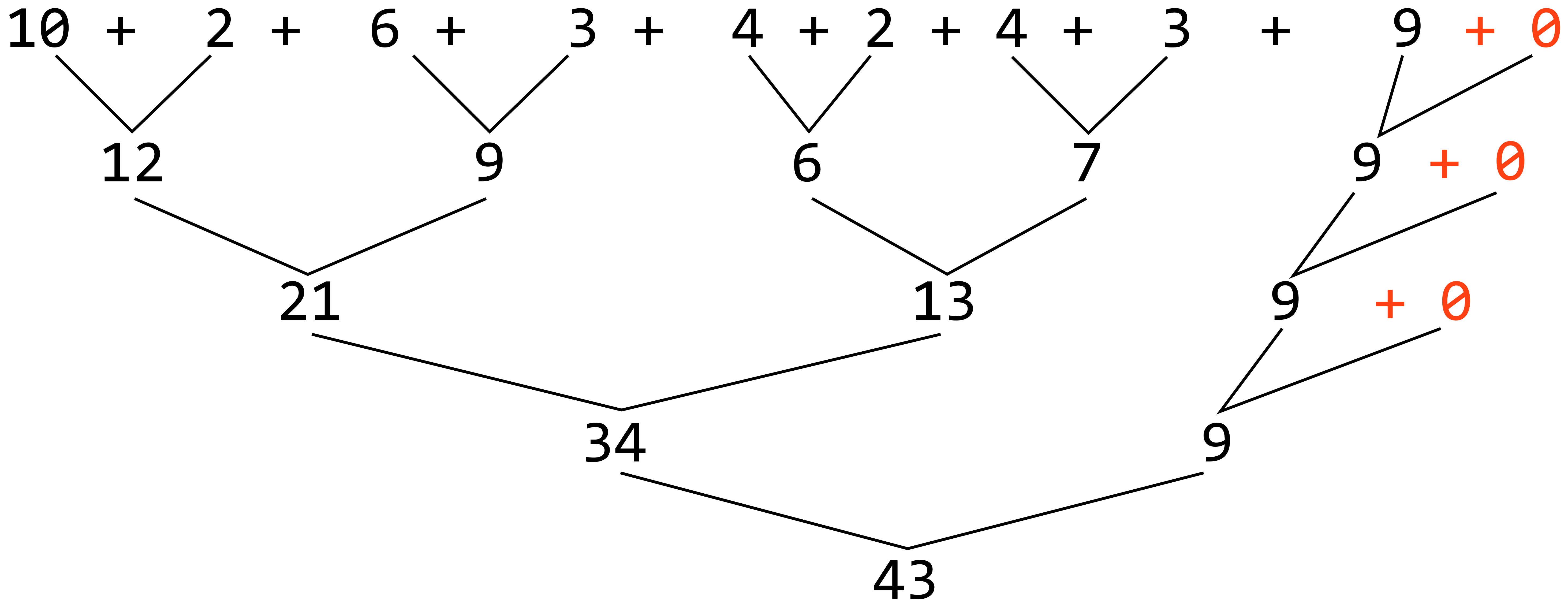
Summation by Reduction

```
Experience is simply the name we give our mistakes.
```



Summation by Reduction

```
Experience is simply the name we give our mistakes.
```



Now, back to the code!

Summary

- Project Lambda covers a lot of territory
  - Changes to JVM, language, compiler, and libraries
- Library enhancements in support of Lambda
  - java.util.stream – new "streams" library
  - java.util.function – functional interfaces
  - various enhancements to collections (mainly default methods)
  - several "point lambdafications" around the class libraries
- Introduce a functional programming style to Java
  - (insert joke about dysfunctional style here)

DEVOXX™
United Kingdom
the java community conference

References

- Main Project Lambda page
  http://openjdk.java.net/projects/lambda/
- Project Lambda Builds
  http://jdk8.java.net/lambda
- Maurice Naftalin's Lambda FAQ
  http://www.lambdafaq.org
- NetBeans builds with Java 8 & Lambda support
  http://wiki.netbeans.org/JDK8

DEVOXX™ United Kingdom the java community conference

Disclaimer

Q&A

DEVOX™ United Kingdom
the java community conference