THE ADVENTUROUS **DEVELOPERS** GUIDE TO **JVM LANGUAGES**

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ABOUT **ME**

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VIRTUAL JUG FOUNDER

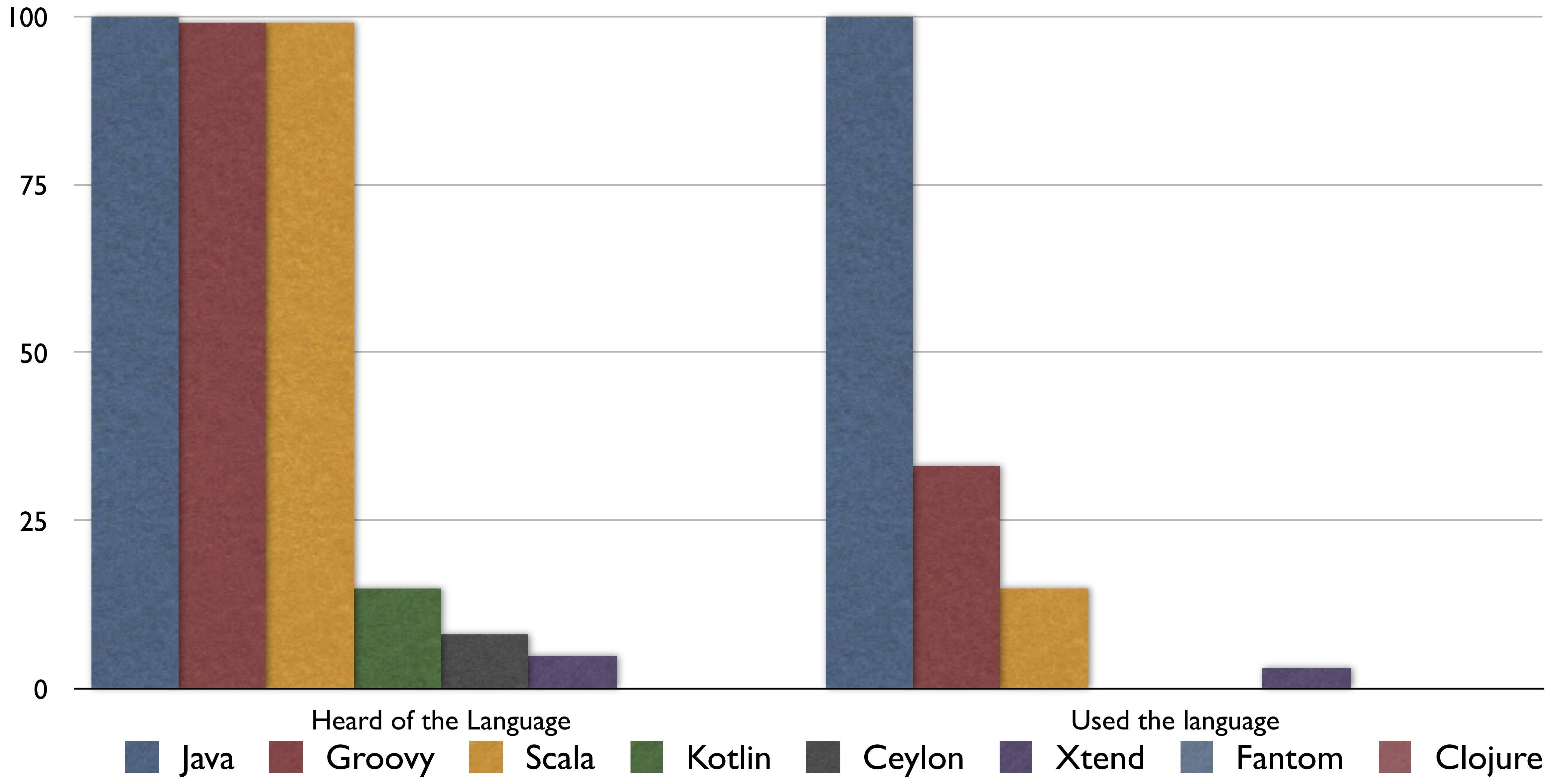
LONDON JUG CO-LEADER

JAVA CHAMPION

JAVAONE ROCKSTAR

REBELLABS AUTHOR

ABOUT **YOU**


100
75
50
25
0
Heard of the Language
Used the language
Java
Groovy
Scala
Kotlin
Ceylon
Xtend
Fantom
Clojure

JAVA

“Most people talk about Java the language, and this may sound odd coming from me, but I could hardly care less.”

JAVA

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JAMES GOSLING,

creator of the Java programming language (2011, TheServerSide)

~~JAVA~~ JVM

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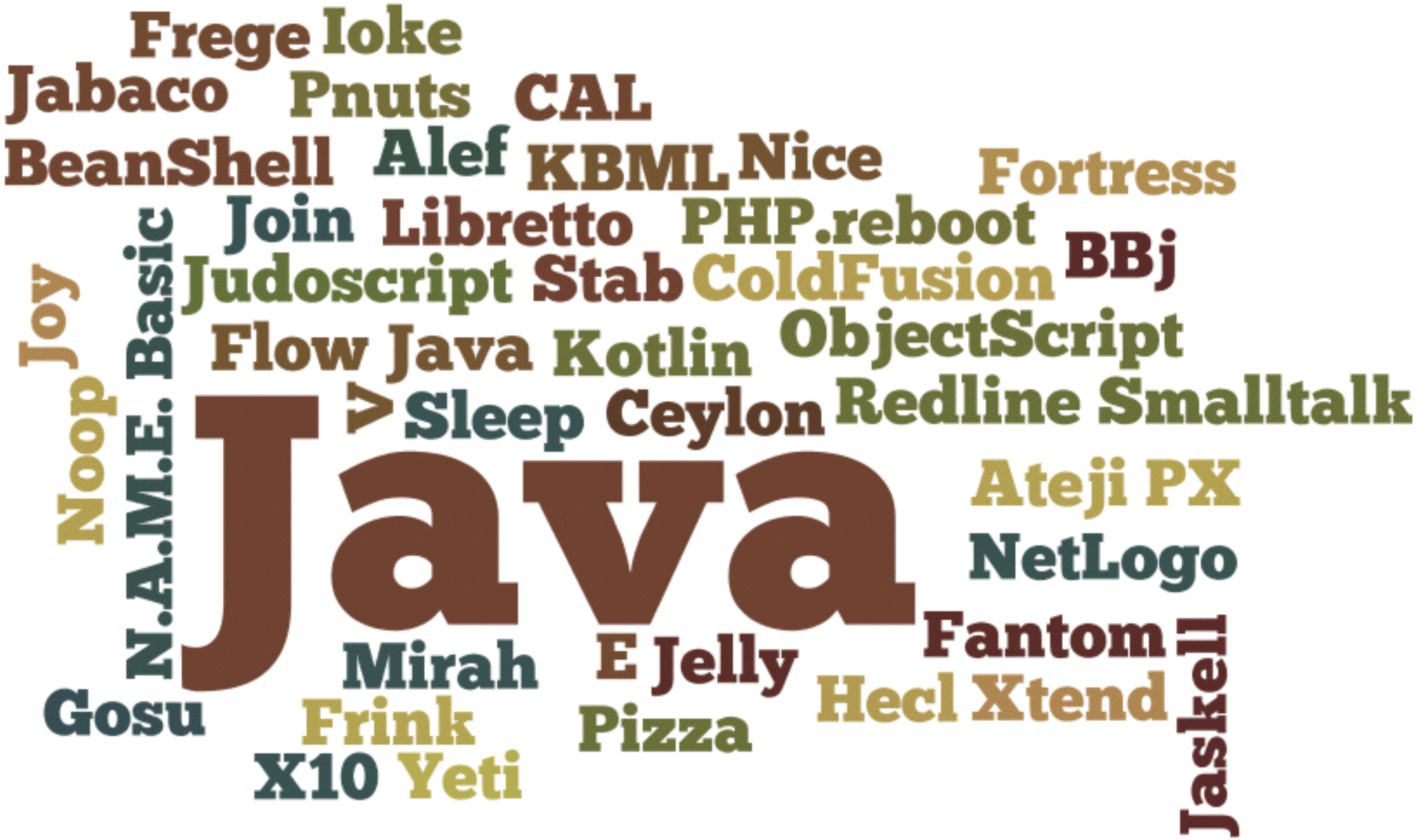
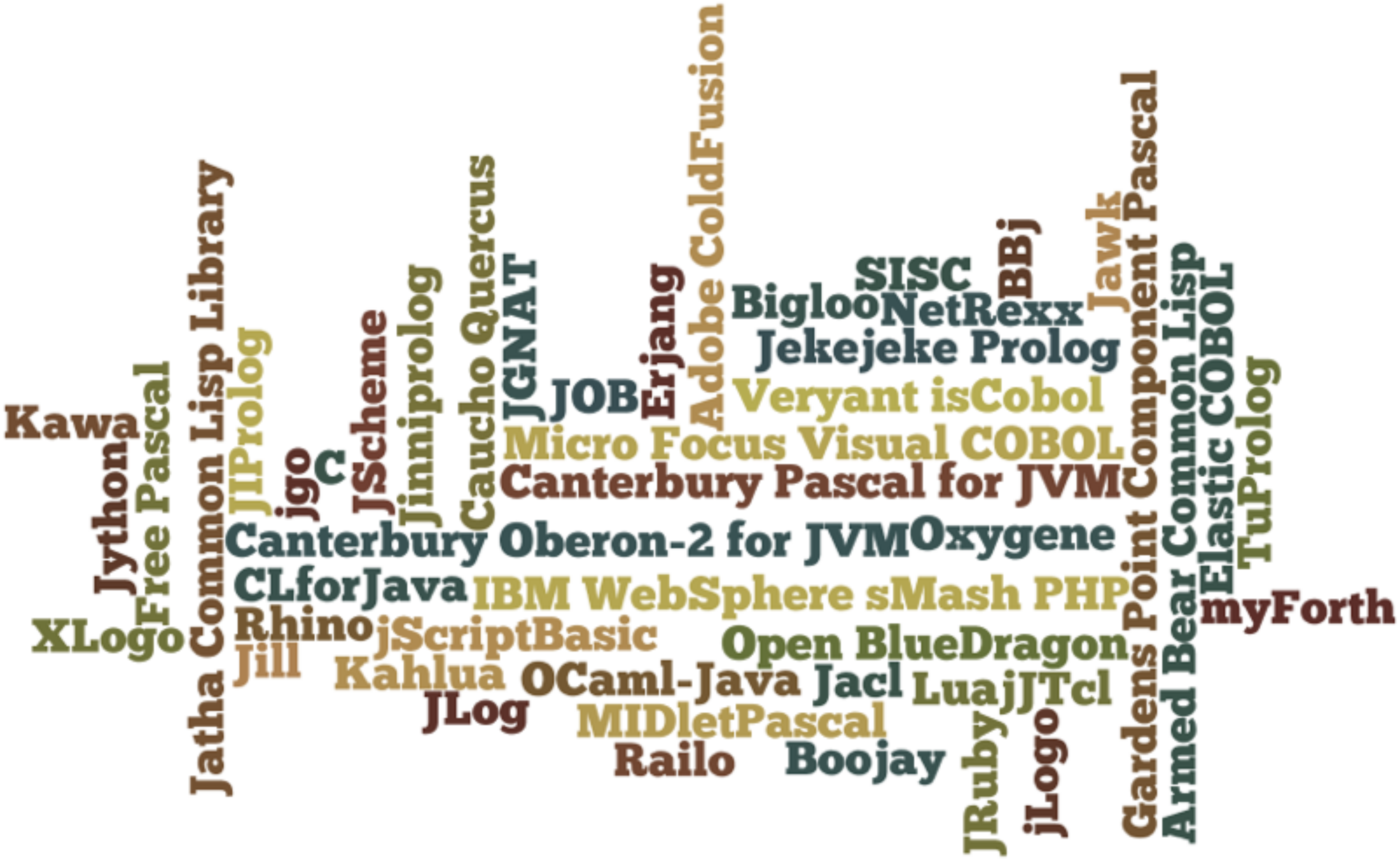
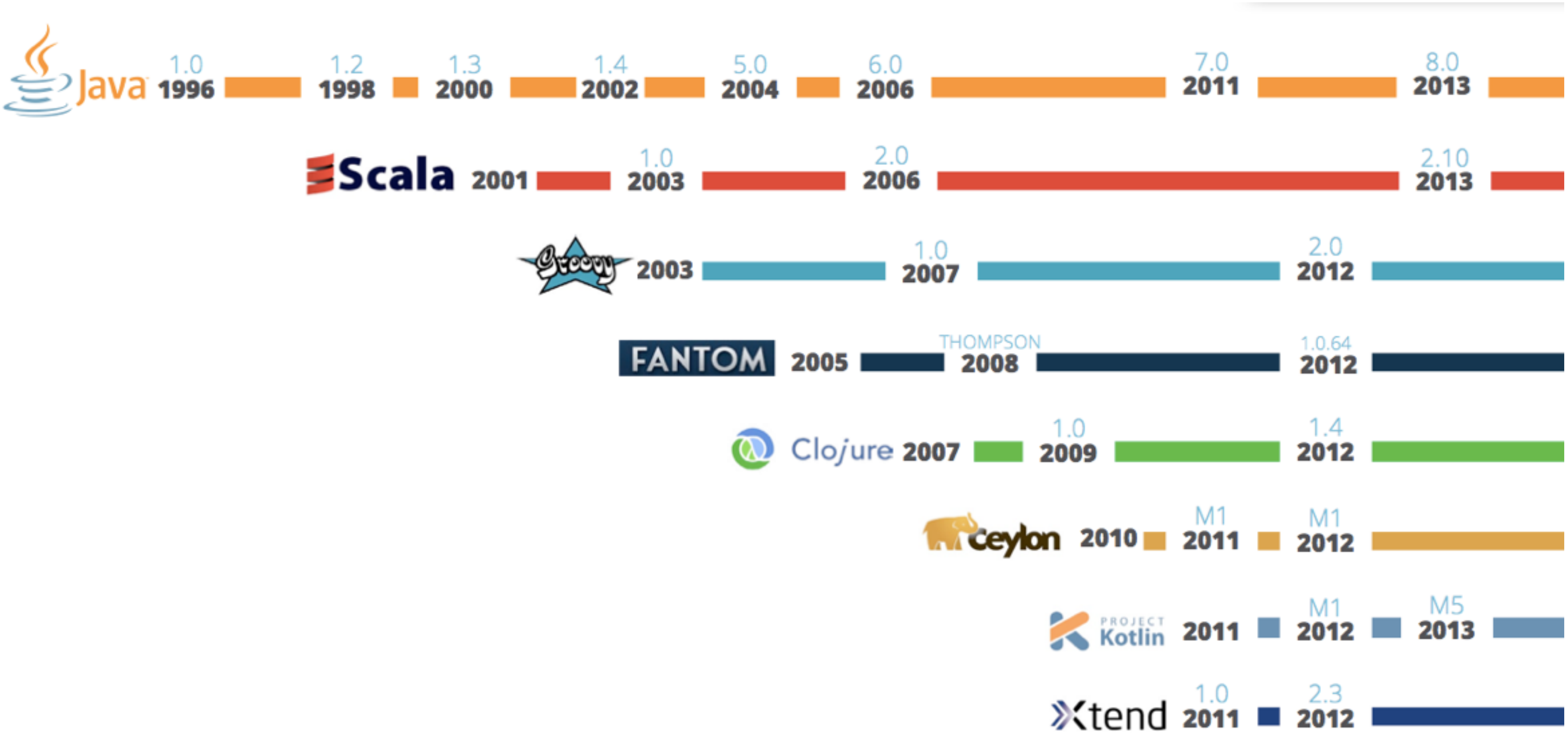
LANGUAGES BUILT FOR THE JVM



LANGUAGES PORTED TO THE JVM




Java
1.0 1996
1.2 1998
1.3 2000
1.4 2002
5.0 2004
6.0 2006
7.0 2011
8.0 2013
Scala
2001
1.0 2003
2.0 2006
2.10 2013
Groovy
2003
1.0 2007
2.0 2012
FANTOM
2005
THOMPSON 2008
1.0.64 2012
Clojure
2007
1.0 2009
1.4 2012
ceylon
2010
M1 2011
M1 2012
PROJECT Kotlin
2011
M1 2012
M5 2013
Xtend
1.0 2011
2.3 2012

Java™ 8

JAVA 8

1. Don’t break **binary compatibility**

2. Avoid introducing **source incompatibilities**

3. Manage **behavioral compatibility** changes

LET'S **EXPERIMENT**

Scala

COMPANION CLASS

NO **STATIC** KEYWORD

```
import HttpServer._
// import statics from companion object
```

VARIABLES

THERE IS NO **FINAL** KEYWORD

```
val name: Type = initializer // immutable value

var name: Type = initializer // mutable variable
```

CASE CLASS

```
case class Status(code: Int, text: String) !

  case method @ ("GET" | "HEAD") =>
  ...
  case method =>
  respondWithHtml(
  Status(501,
          "Not Implemented"),
          title = "501 Not Implemented",
          body = <H2>501 Not Implemented: { method } method</H2>
  )
  ...
```

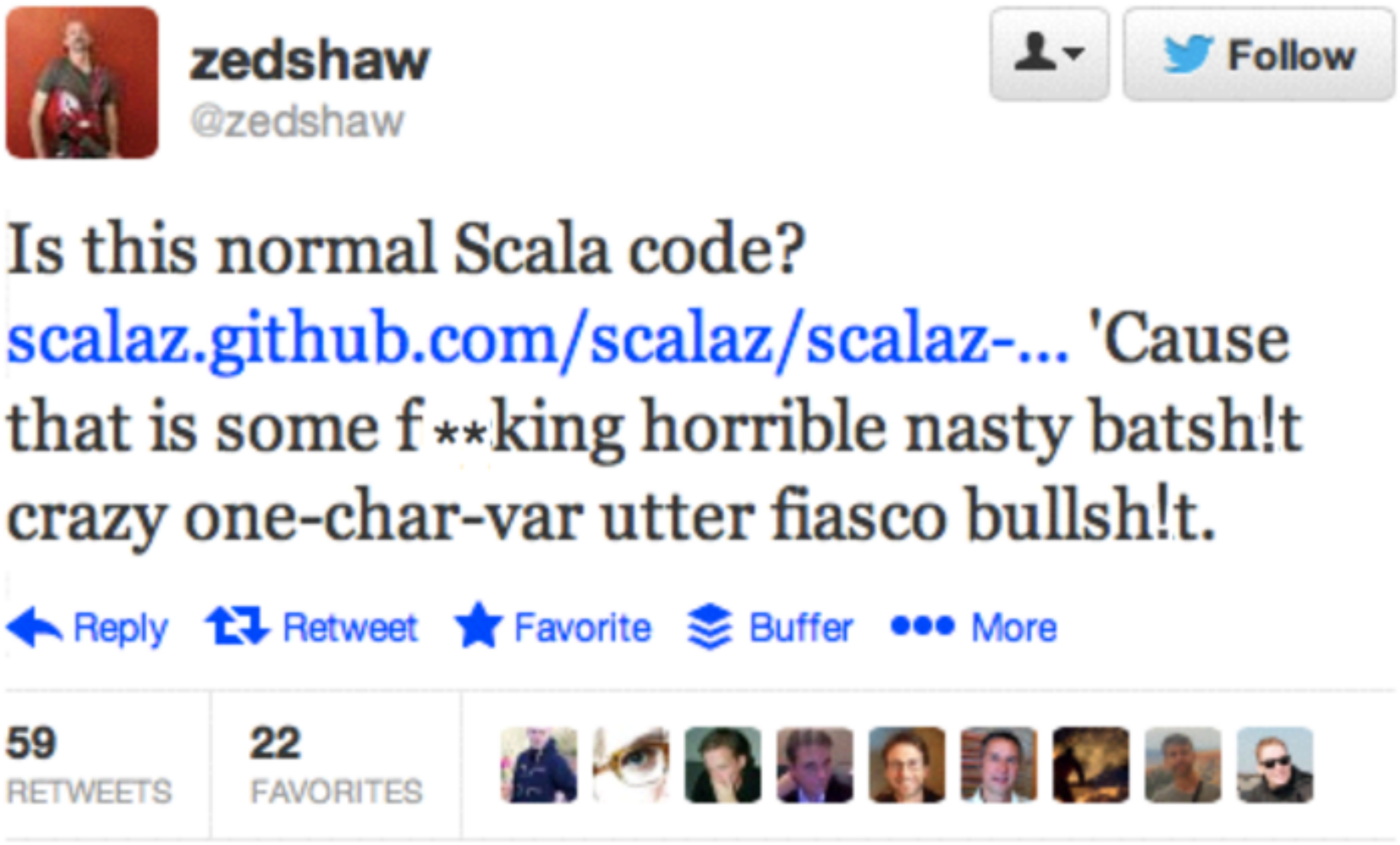
STRINGS

```
val header = s"""
       |HTTP/1.1 ${status.code} ${status.text}
       |Server: Scala HTTP Server 1.0
       |Date: ${new Date()}
       |Content-type: ${contentType}
       |Content-length: ${content.length}
       """.trim.stripMargin + LineSep + LineSep
```

NULL

```
def toFile(file: File, isRetry: Boolean = false): Option[File] =
 if (file.isDirectory && !isRetry)
  toFile(new File(file, DefaultFile), true)
  else if (file.isFile)
  Some(file)
  else
None
```

COMPLEXITY?

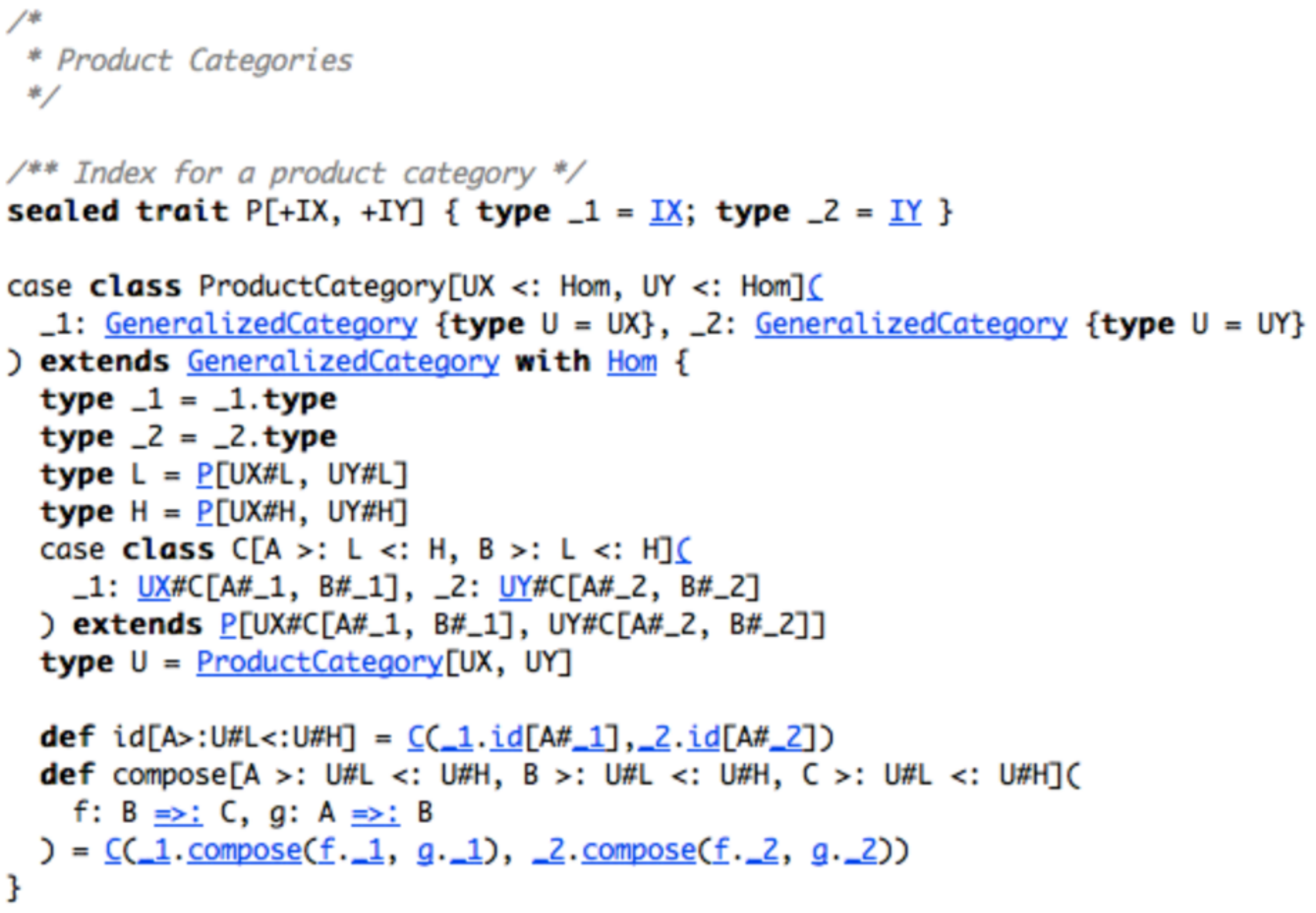


zedshaw
@zedshaw

Is this normal Scala code? scalaz.github.com/scalaz/scalaz-... 'Cause that is some f**king horrible nasty batsh!t crazy one-char-var utter fiasco bullsh!t.

59 RETWEETS

22 FAVORITES

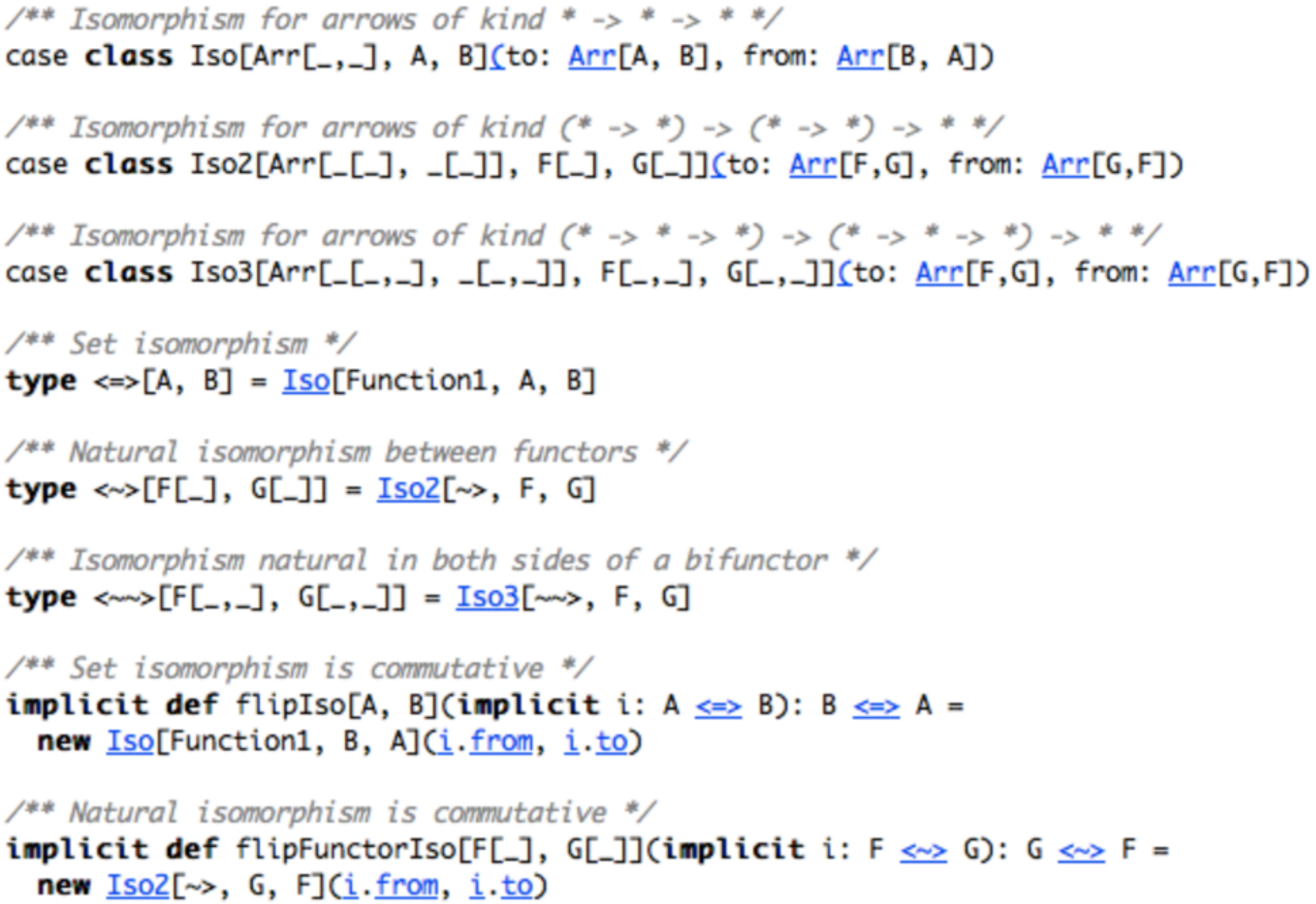


```scala
/*
 * Product Categories
 */

/** Index for a product category */
sealed trait P[+IX, +IY] { type _1 = IX; type _2 = IY }

case class ProductCategory[UX <: Hom, UY <: Hom](
  _1: GeneralizedCategory {type U = UX}, _2: GeneralizedCategory {type U = UY}
) extends GeneralizedCategory with Hom {
  type _1 = _1.type
  type _2 = _2.type
  type L = P[UX#L, UY#L]
  type H = P[UX#H, UY#H]
  case class C[A >: L <: H, B >: L <: H](
    _1: UX#C[A#_1, B#_1], _2: UY#C[A#_2, B#_2]
  ) extends P[UX#C[A#_1, B#_1], UY#C[A#_2, B#_2]]
  type U = ProductCategory[UX, UY]

  def id[A>:U#L<:U#H] = C(_1.id[A#_1],_2.id[A#_2])
  def compose[A >: U#L <: U#H, B >: U#L <: U#H, C >: U#L <: U#H](
    f: B =>: C, g: A =>: B
  ) = C(_1.compose(f._1, g._1), _2.compose(f._2, g._2))
}
```



```
/** Isomorphism for arrows of kind * -> * -> * */
case class Iso[Arr[_,_], A, B](to: Arr[A, B], from: Arr[B, A])

/** Isomorphism for arrows of kind (* -> *) -> (* -> *) -> * */
case class Iso2[Arr[_[_], _[_]], F[_], G[_]](to: Arr[F,G], from: Arr[G,F])

/** Isomorphism for arrows of kind (* -> * -> *) -> (* -> * -> *) -> * */
case class Iso3[Arr[_[_,_], _[_,_]], F[_,_], G[_,_]](to: Arr[F,G], from: Arr[G,F])

/** Set isomorphism */
type <=>[A, B] = Iso[Function1, A, B]

/** Natural isomorphism between functors */
type <~>[F[_], G[_]] = Iso2[~>, F, G]

/** Isomorphism natural in both sides of a bifunctor */
type <~~>[F[_,_], G[_,_]] = Iso3[~~>, F, G]

/** Set isomorphism is commutative */
implicit def flipIso[A, B](implicit i: A <=> B): B <=> A =
  new Iso[Function1, B, A](i.from, i.to)

/** Natural isomorphism is commutative */
implicit def flipFunctorIso[F[_], G[_]](implicit i: F <~> G): G <~> F =
  new Iso2[~>, G, F](i.from, i.to)
```

Groovy

JAVA **SUPERCHARGED!**

NULL

```
def streetName = user?.address?.street
```

ELVIS LIVES

```
def displayName = user.name ?: "Anonymous"
```

CLOSURES

```
square = { it * it }

[ 1, 2, 3, 4 ].collect(square) // [1, 4, 9, 16]
```

COLLECTIONS

```
def names = ["Ted", "Fred", "Jed", "Ned"]
println names //[Ted, Fred, Jed, Ned]

def shortNames = names.findAll { it.size() <= 3 }
shortNames.each { println it } // Ted
                               // Jed
                               // Ned
```

GROOVY 2.0 - DYNATIC

```
void someMethod() {}

  void test() {


    sommeeMethod()
  }
```

GROOVY 2.0 - DYNATIC

```
import groovy.transform.TypeChecked
void someMethod() {}
@TypeChecked
  void test() {




    sommeeMethod()
  }
```

GROOVY 2.0 - DYNATIC

```
import groovy.transform.TypeChecked
void someMethod() {}
@TypeChecked
  void test() {
    //compilation error:
    //cannot find matching method sommeeMethod()
    sommeeMethod()
  }
```

YAH, WE SAVE LIVES!

Founder/CEO Jevgeni “Hosselhuff” Kabanov gets ready to save more Java developers from redeploy madness with JRebel

Ceylon

LET'S EXPERIMENT

PROJECT

Kotlin

LET'S **EXPERIMENT**

Xtend

LET'S **EXPERIMENT**

SUMMARY

Functions are **first class citizens**

and should be treated as such!

SUMMARY

EvErY-ONe'S
5YNT4X SuCkS...

SUMMARY

EvErY-ONe'S
5YNT4X SuCkS...

...to someone else!

SUMMARY

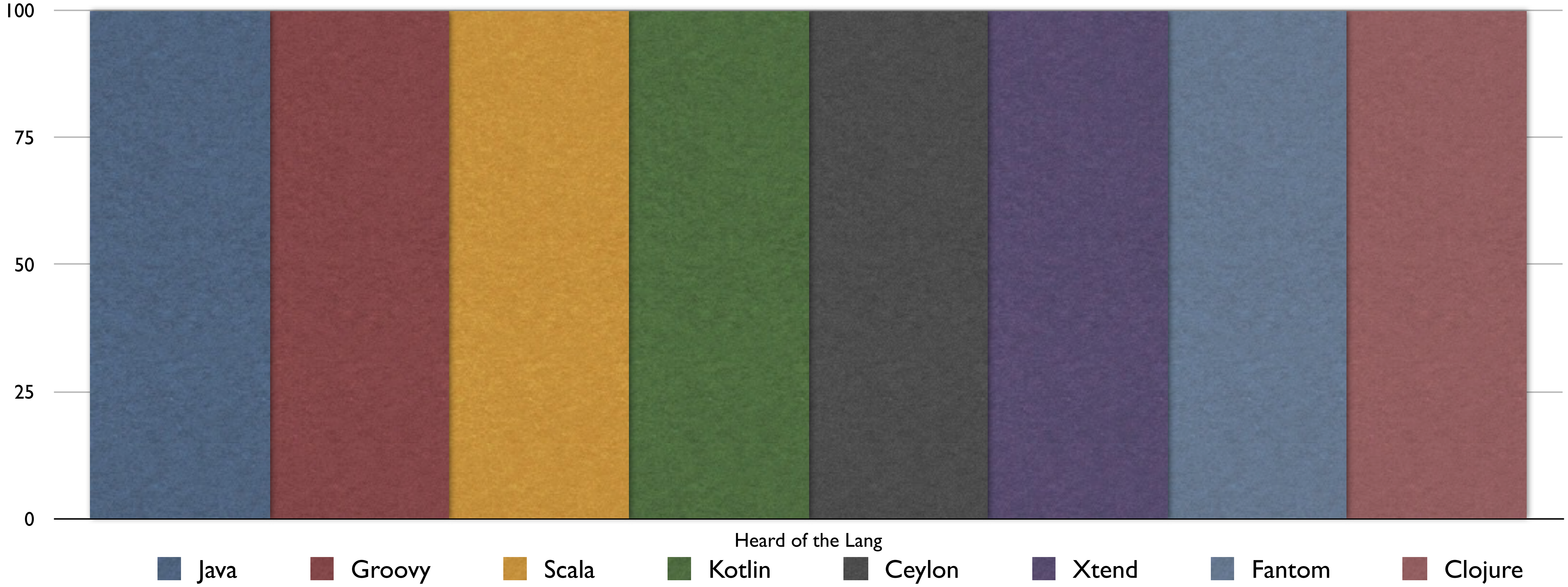
The JVM is **AWESOME**

SUMMARY

The JVM is **AWESOME**

BE **ADVENTUROUS!**

YOU, ONE HOUR LATER



RESOURCES

HTTPSERVER EXAMPLES OF EACH LANGUAGE ON GITHUB

https://github.com/zeroturnaround/jvm-languages-report

THE **ADVENTUROUS DEVELOPERS** GUIDE TO JVM LANGUAGES

http://zeroturnaround.com/rebellabs/devs/the-adventurous-developers-guide-to-jvm-languages/

FREE STUFF!

JRebel

0t.ee/javaone-jr

XRebel

0t.ee/javaone-xr

HOPE YOU ENJOYED
THE PRESENTATION

IF NOT, AND YOU WOULD LIKE TO
CLAIM YOUR 60 WASTED MINUTES BACK,
PLEASE REDEEM VIA

JRebel