




Kotlin on Android

Svetlana Isakova
The JetBrains logo, with 'Jet' in orange and 'BRAINS' in blue.



Kotlin is...

- general purpose JVM language
- open source
- compiled to java byte code
(or JavaScript)
- from JetBrains

Outline



Motivation



Kotlin features



Android examples

Kotlin is...

Modern language

Concise
Expressive

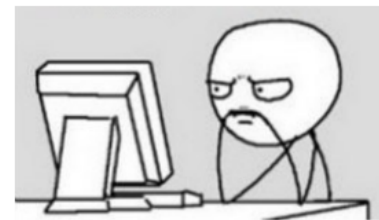
No boilerplate

Type Inference
Functions as Values
Extensions
...

Right Abstractions

for
Industry

- 2.5 MLOC
- 10 years
- 30 colleagues



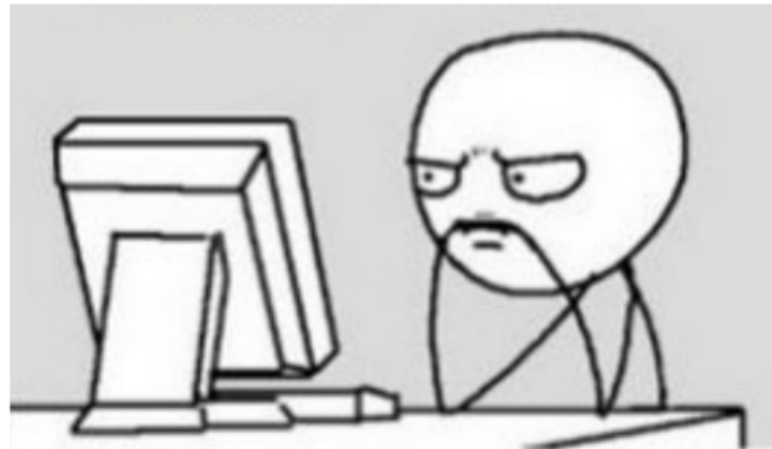
**I READ much more
code than I WRITE**

Learning

for

Industry

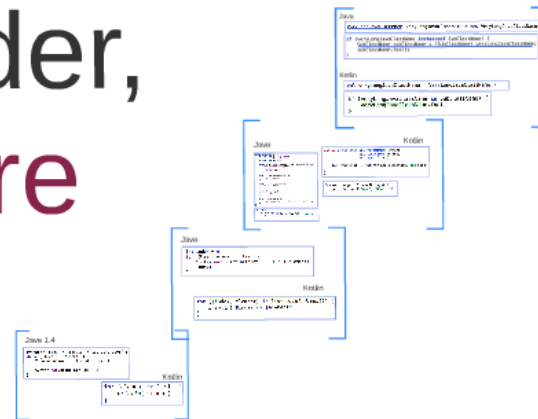
- 2.5 MLOC
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- 30 colleagues



**I READ much more
code than I WRITE**

Goal

Code contains
enough information
for the reader,
but **not more**



```
public class User {
    private final String firstName;
    private final String lastName;
    private final int age;

    public User(String firstName, String lastName, int age) {
        this.firstName = firstName;
        this.lastName = lastName;
        this.age = age;
    }

    public String getFirstName() {
        return firstName;
    }

    public String getLastName() {
        return lastName;
    }

    public int getAge() {
        return age;
    }

    public String toString() {
        return firstName + " " + lastName + ", age " + age;
    }
}
```

Java

```
public class User {
    private final String firstName;
    private final String lastName;
    private final int age;

    public User(String firstName, String lastName, int age) {
        this.firstName = firstName;
        this.lastName = lastName;
        this.age = age;
    }

    public String getFirstName() {
        return firstName;
    }

    public String getLastName() {
        return lastName;
    }

    public int getAge() {
        return age;
    }

    public String toString() {
        return firstName + " " + lastName + ", age " + age;
    }
}
```

```
class Main {
    public static void main(String[] args) {
        System.out.println(new User("John", "Doe", 30));
    }
}
```

```
if (veryLongJavaClassName is Su
    veryLongJavaClassName.foo()
}
```

Kotlin

```
public class User(val firstName: String,
                  val lastName: String,
                  val age: Int) {


    fun toString() = "$firstName $lastName, age $age"
}
```

```
fun main(args : Array<String>) {
    println(User("John", "Doe", 30))
}
```



Java

```
VeryLongJavaClassName veryLongJavaClassName = new VeryLongJavaClassName();
```


```
if (veryLongJavaClassName instanceof SubClassName) {  
    SubClassName subClassName = (SubClassName) veryLongJavaClassName;  
    subClassName.foo();  
}
```



Kotlin

```
val veryLongJavaClassName = VeryLongJavaClassName() 
```

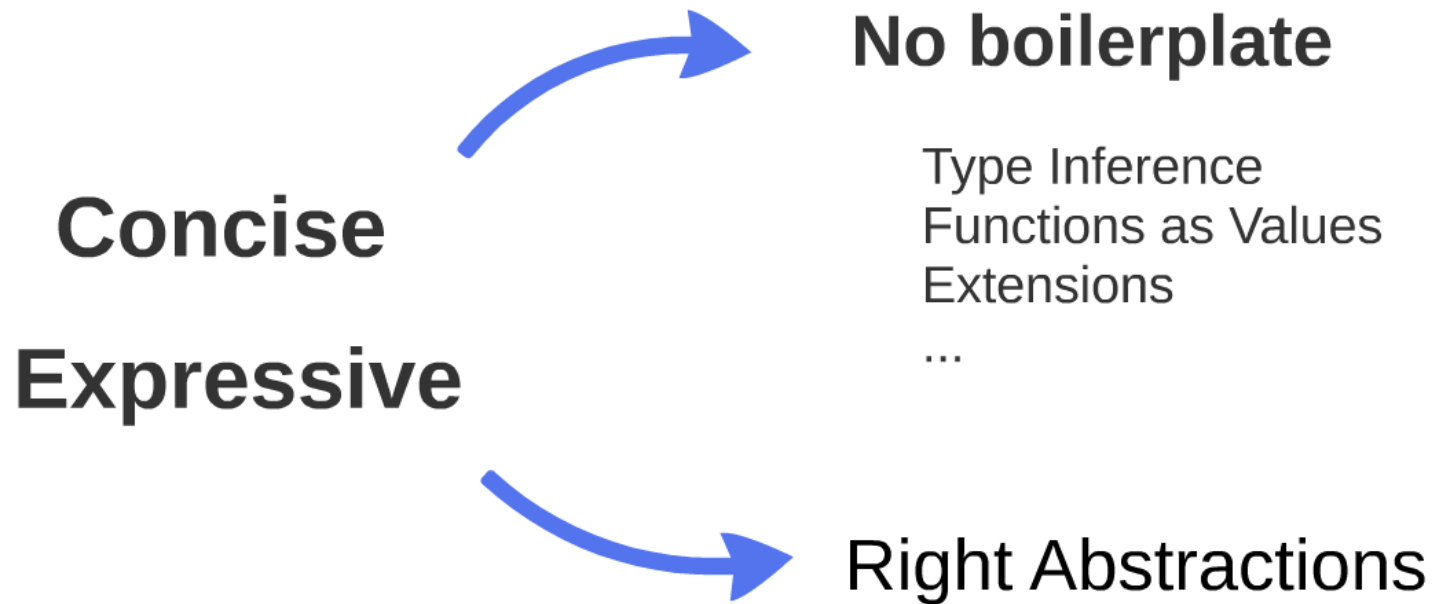
```
if (veryLongJavaClassName is SubClassName) {  
    veryLongJavaClassName.foo()  
}
```



Kotlin

```
class User(val firstName: String,
```

Modern



Industry requirements

- Java interoperability

- tools support

- performance

- safety

static typing



Safety

stronger type system



fewer errors

more safe

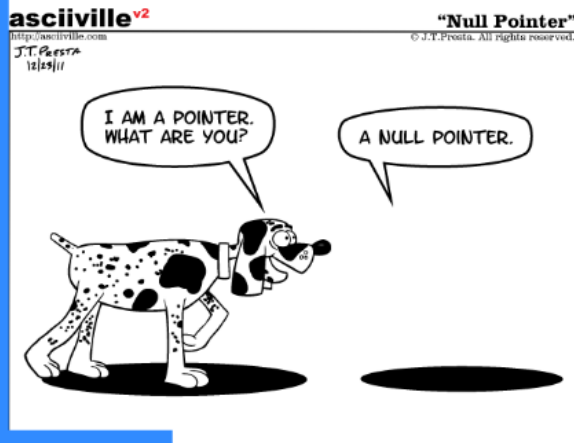
Converting runtime errors into compile time errors

The Billion Dollar Mistake!

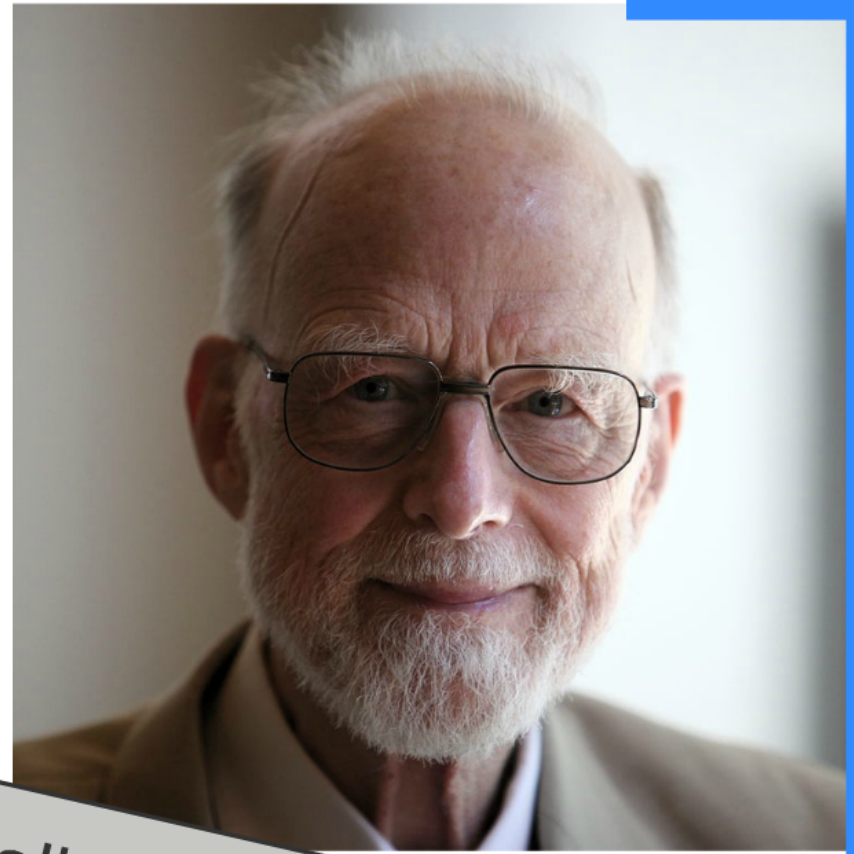


mutable collections

? extends T



Sir Tony Hoare



Known for:

- quicksort
(at the age 26)
- Hoare logic
- CSP (communicating sequential processes)

"I call it my **billion-dollar mistake**.
It was the invention of
the **null reference** in 1965."

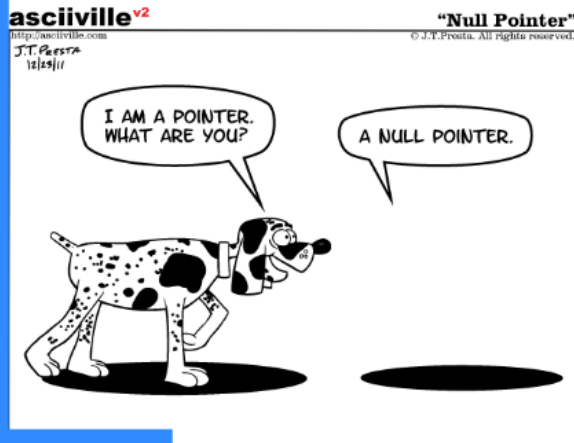
Converting runtime errors into compile time errors

The Billion Dollar Mistake!



mutable collections

? extends T





concise

- + + + +

safer
than Java

- - + + +

can be
easily used
from Java

+ + - - +



Smart ● ~~Boilerplate~~

Expressive ● ~~Repetition~~

Safe ● ~~Errors~~

What's wrong?..

When Kotlin 1.0?

THIS SUMMER



Demo

How to start using Kotlin in Android Studio?

- Install 'Kotlin' plugin
- Convert Java activity to Kotlin (or just copy-paste)
- Configure Kotlin in project



Jar / dex size*

Library	Jar Size	Dex Size
kotlin-runtime-0.10.195	354 KB	282 KB
kotlin-stdlib-0.10.195	541 KB	835 KB

Library	Jar Size	Dex Size
scala-library-2.11.5	5.3 MB	4.9 MB
groovy-2.4.0-grooid	4.5 MB	4.5 MB
guava-18.0	2.2 MB	1.8 MB

Library	Jar Size	Dex Size
rxjava-1.0.4	678 KB	513 KB
support-v4-21.0.3	745 KB	688 KB
play-services-base-6.5.87	773 KB	994 KB
okio-1.2.0	54 KB	55 KB
okhttp-2.2.0	304 KB	279 KB
retrofit-1.9.0	119 KB	93 KB
picasso-2.4.0	112 KB	97 KB
dagger-1.2.2	59 KB	54 KB
butterknife-6.0.0	48 KB	50 KB
wire-runtime-1.6.1	71 KB	71 KB
gson-2.3.1	206 KB	170 KB
Total	2963 KB	2894 KB

*from Jake Wharton's
"Using Project Kotlin for Android"

References

Kotlin

<http://kotl.in>

Kotlin Extensions For Android

Anko

<https://github.com/jetbrains/anko>

Anko Dsl Preview

Kotlin Koans

<http://github.com/jetbrains/workshop-jb>

Thank you!