Breizh C@mp
Mix de technologies

DIY: Java Static Analysis

#sonarqube

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@sonarsource

Ego boost

- Java developer
- Developer @Sonarsource
  - Developer in language team
  - Lead of sonar java plugin
- Twitter / github : @benzonico
- Geneva Jug enthusiast

Static Analysis

Analyze code,

without executing it.

Code Quality

Continuous Inspection

sonarqube

Sonar Java Plugin

- Back Story

Challenge

Get the language.

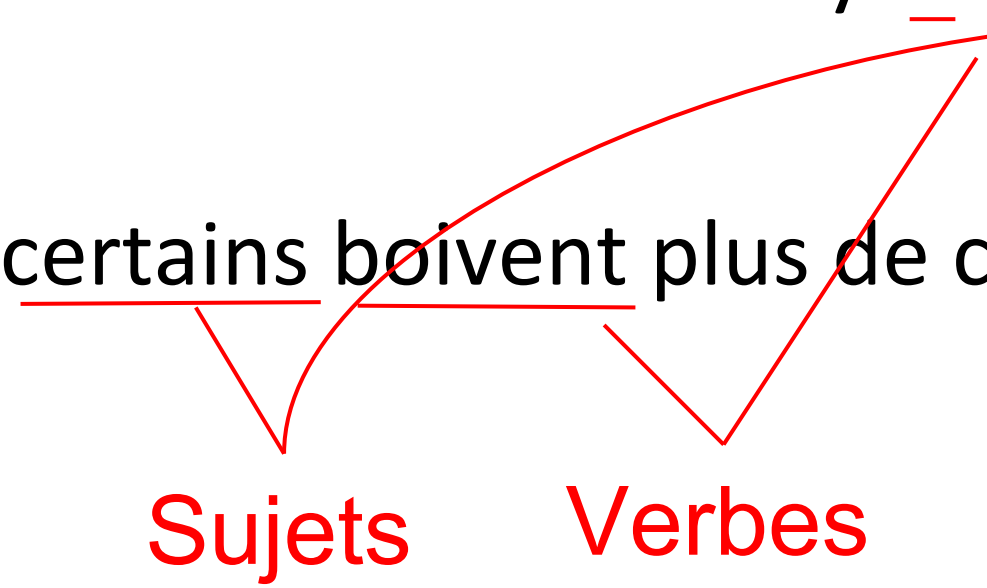
CHALLENGE ACCEPTED.

Lexical Analysis

Chez SonarSource il y a 31 employés mais certains boivent plus de café que d’autres.

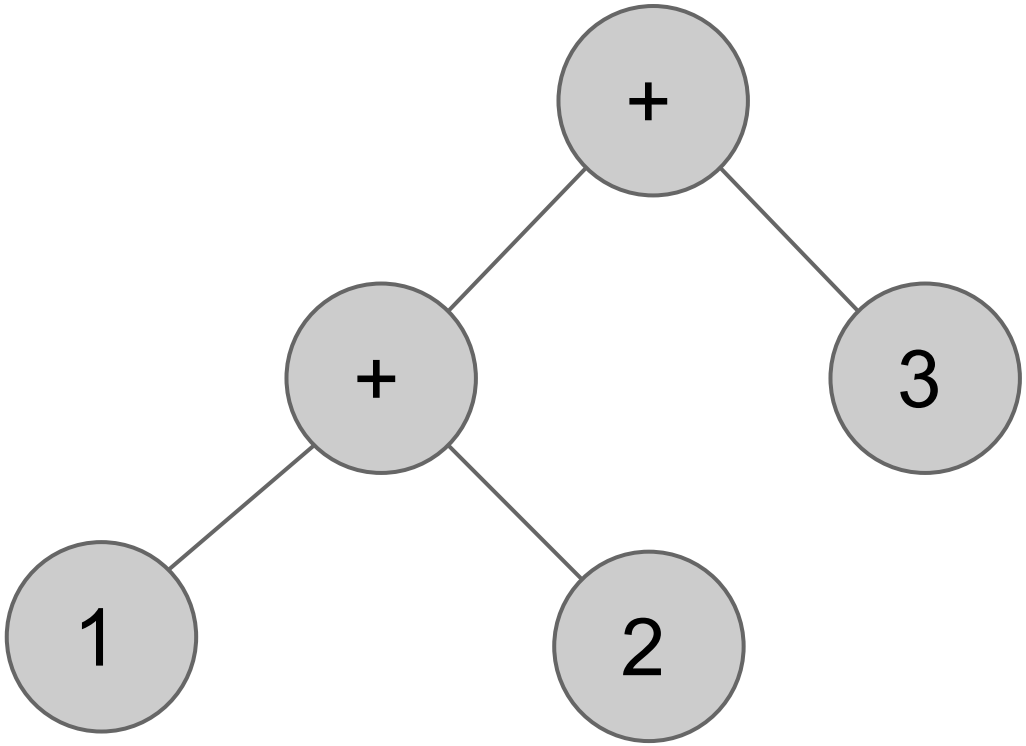
Syntactic Analysis

Chez SonarSource il y a 31 employés mais certains boivent plus de café que d'autres.



Syntax Tree

1 + 2 + 3



Java pop quizz !!

[ ]

[ ]) [ ] [ ] {

```
int[ ] foo(int  a[ ] ) [ ] [ ] {
        return null;
}
```

```
int[ ] foo(int  a[ ] ) [ ] [ ] {
        return null;
}
```

```
int[ ][ ][ ] foo(int[ ]  a){
        return null;
}
```

Semantic Analysis

Chez SonarSource il y a 31 employés mais certains boivent plus de café que d'autres.

Java pop quizz !!

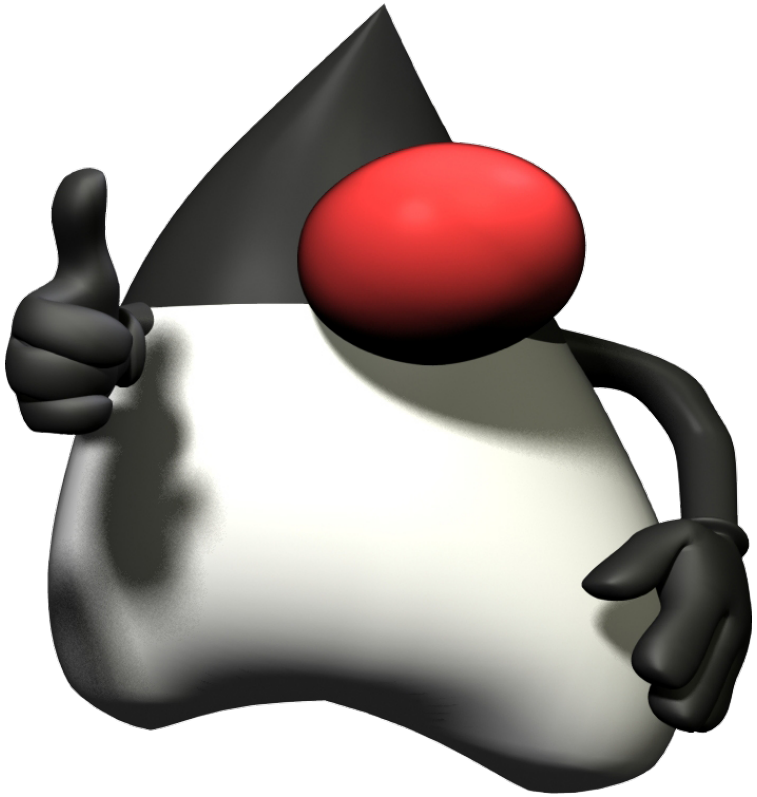
```
class Foo<T> {
    class T {
    }
    T myField;
}
```

Java pop quizz !!

```
class Foo<T> {
    class T {
    }
    T myField;
}
```

How do you know that ?

JLS is your best friend



http://docs.oracle.com/javase/specs/jls/se8/html/index.html

Java pop quizz !!

```
interface F1 {
}

interface F2 {
}
```

Java pop quizz !!

```
class A<T extends F1 & F2>{
    void fun(F1 f1){}
    void fun(T t){}
}
```

Java pop quizz !!

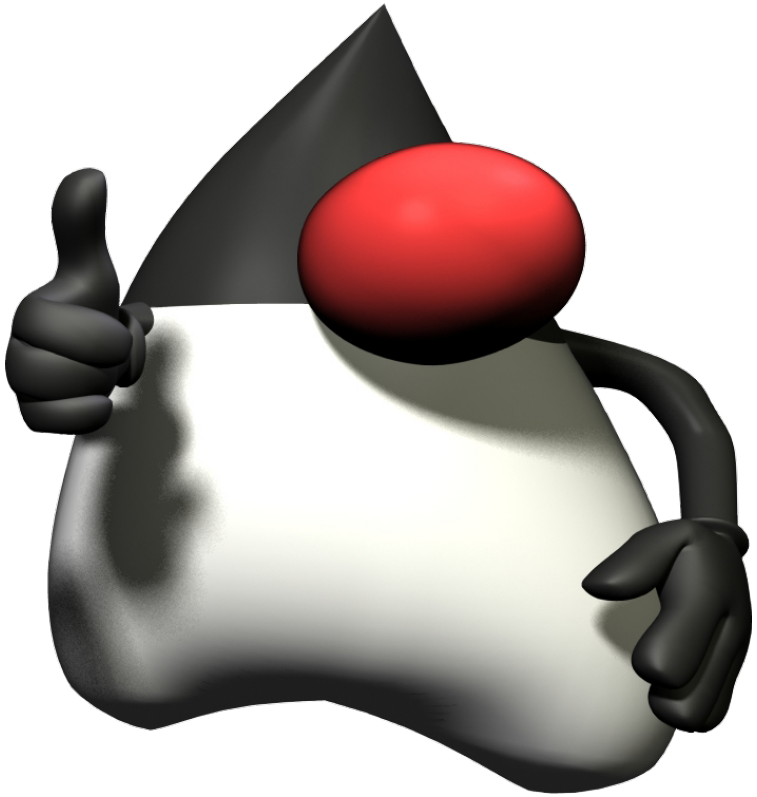
```
class A<T extends F2 & F1>{
    void fun(F1 f1){}
    void fun(T t){}
}
```

Java pop quizz !!

The erasure of a type variable is the erasure of its leftmost bound.

How do you know that ?

JLS is your best friend



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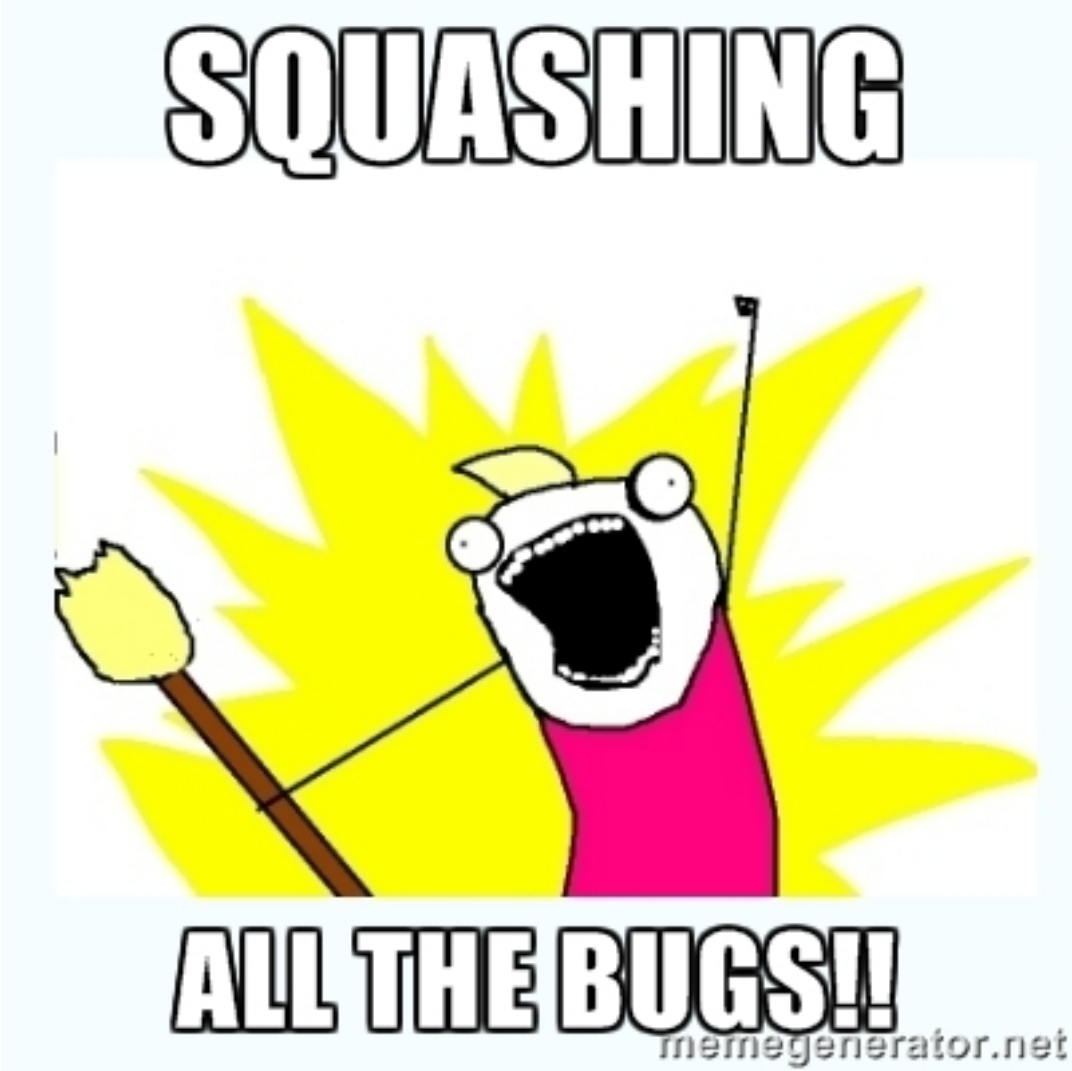
Sonar java plugin



Incorrect logic

From… sonar-persitit… source code

```
            for (int j = 0; j < 2 && index >= 0; j++) {
                if (index < 0)
```

Change this condition so that it does not always evaluate to "false" ···

il y a 5 jours ▾ L4001

Bloquant ○ Ouvert Non affecté Non planifié 15min debt

bug, cwe, misra

```
                    break;
```

Bad use of API

```
l.ga…    public boolean hasNext() {
l.ga…      if (limit > 0 && resultCount >= limit)
l.ga…        return false;

l.ga…      if (lastTraversed == null)
             // GET THE NEXT
             lastTraversed = next();
```

Refactor the implementation of this "Iterator.hasNext()" method to not call "Iterator.next()". ···

Blocker ○ Open Not assigned Not planned 20min debt

```
enis…      if (lastTraversed == null && !context.isEmpty())
l.ga…        throw new IllegalStateException("Traverse ended abnormally");

l.ga…      if (!context.checkTimeout())
             return false;

l.ga…      // BROWSE ALL THE RECORDS
           return lastTraversed != null;
         }
```

From OrientDB

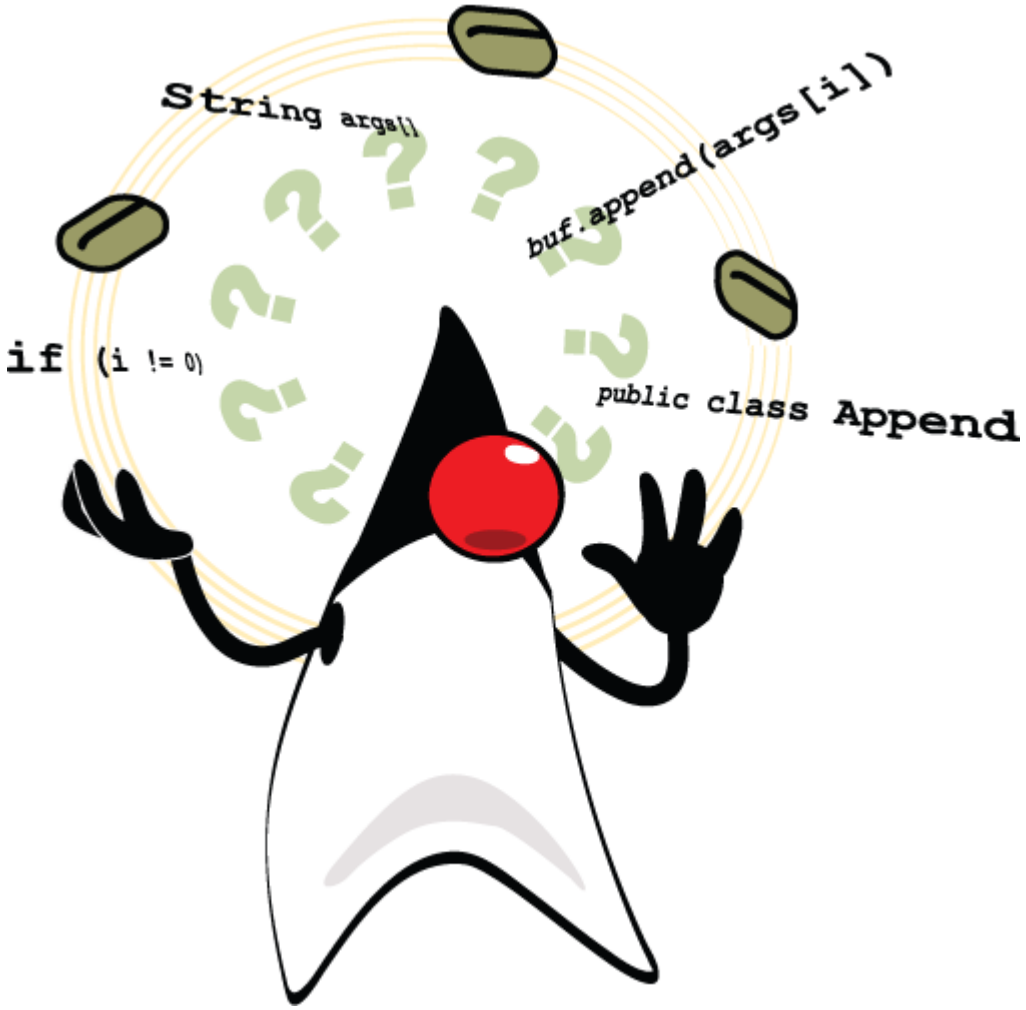
Your turn now : Custom rules !

Let’s Code !

Beyond semantic...

- Symbolic Execution :

Evgeny travaille chez SonarSource et il boit uniquement du café. Chez SonarSource il y a 31 employés mais certains boivent plus de café que d'autres.

Evgeny boit probablement plus de café que les autres employés.

Q & A