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# Checkstyle: Теория и практика

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# АНДРЕЙ ПАЙКИН

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# ABOUT CHECKSTYLE

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Создан в 2001 году



100+ встроенных проверок



# ABOUT CHECKSTYLE

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```
@Level(value = "high") String getValue(String o)
{
    if (o.equals("my_key"))
    {
        return o + 199;
    }
    return o;
}
```

# ABOUT CHECKSTYLE

---

```
private static final int CODE = 199;
```

```
/** Here is javadoc */
```

```
@Level("high")
```

```
String getValue(String prefix) {  
    if ("my_key".equals(prefix)) {  
        return prefix + CODE;  
    }  
    return prefix;  
}
```

# OVERVIEW

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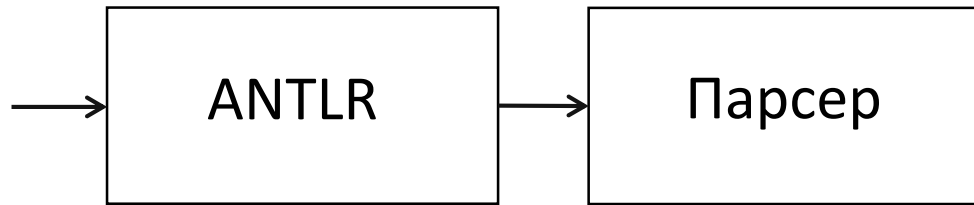


# ANTLR PARSER

---

Grammar файл

```
tryBlock : "try"^  
         (resourceSpecification)?  
         compoundStatement  
         (handler)*  
         ( finallyHandler )?  
         ;
```



# AST

```
class Hello {  
    void mymethod() {  
        // some code  
    }  
}
```

Парсер

```
CLASS_DEF  
|--MODIFIERS  
|--LITERAL_CLASS -> class  
|--IDENT -> Hello  
`--OBJBLOCK  
    |--LCURLY -> {  
    |--METHOD_DEF  
    |   |--MODIFIERS  
    |   |--TYPE  
    |   |   `--LITERAL_VOID -> void  
    |   |--IDENT -> mymethod  
    |   |--LPAREN -> (  
    |   |--PARAMETERS  
    |   |--RPAREN -> )  
    |   `--SLIST -> {  
    |       `--RCURLY -> }  
    `--RCURLY -> }
```



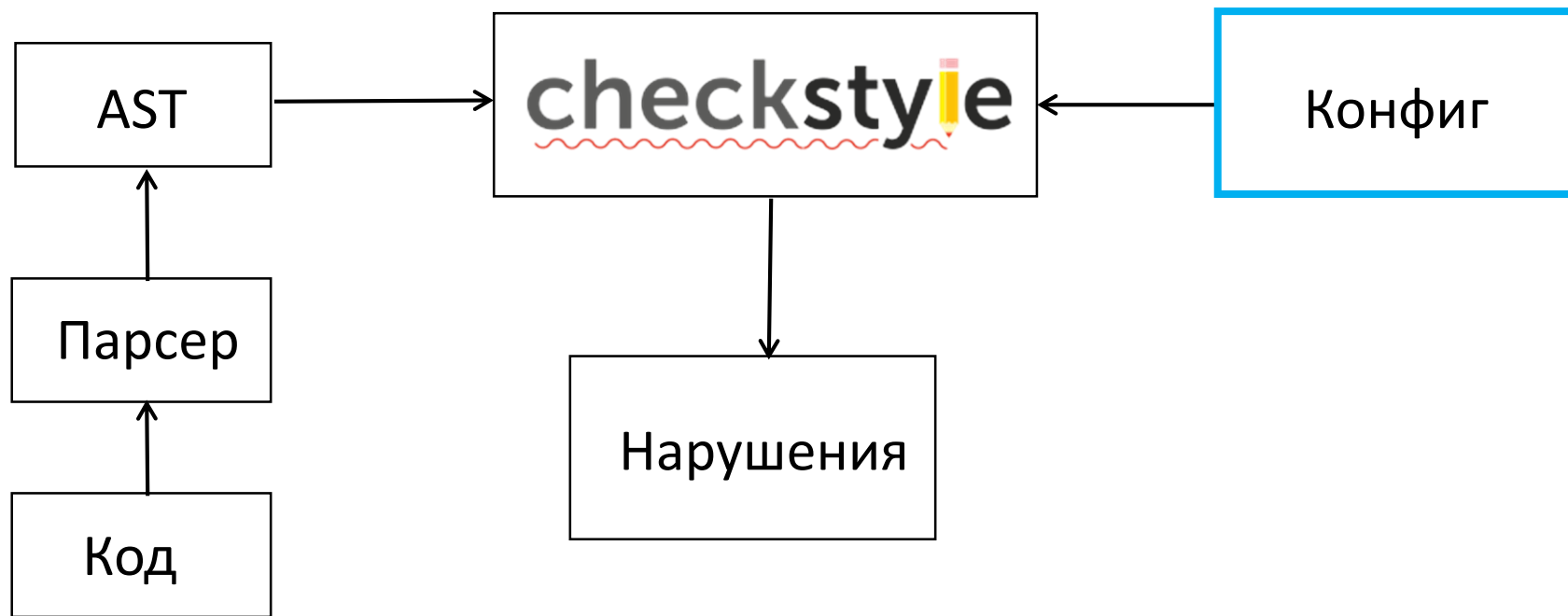
# НЮАНСЫ AST

```
class Hello {  
    ;  
    {  
        ;  
    }  
}
```

```
CLASS_DEF  
| --MODIFIERS  
| --LITERAL_CLASS -> class  
| --IDENT -> Hello  
`--OBJBLOCK  
    | --LCURLY -> {  
    | --SEMI -> ;  
    | --INSTANCE_INIT  
    |     `--SLIST -> {  
    |         | --EMPTY_STAT -> ;  
    |         `--RCURLY -> }  
    `--RCURLY -> }
```

# OVERVIEW

---



# CHECK CONFIG

---

```
<module name="NeedBracesCheck">
  <property name="id" value="Check_lambdas"/>
  <property name="message" value="Lambda needs braces"/>
  <property name="tokens" value="LAMBDA"/>
  <property name="severity" value="ERROR"/>
</module>

<module name="NeedBracesCheck" />
```

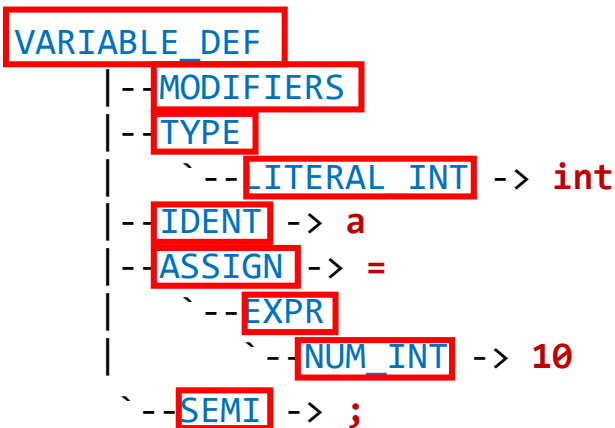
# MANY CHECKS CONFIG

---

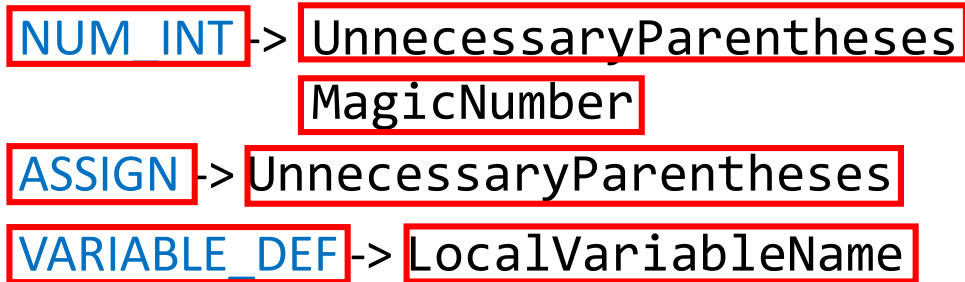
```
<module name="TreeWalker">
  <module name="NeedBracesCheck">
    <property name="id" value="Check_lambdas"/>
    <property name="tokens" value="LAMBDA"/>
  </module>
  <module name="NeedBracesCheck">
    <property name="id" value="Check_if_else"/>
    <property name="tokens" value="LITERAL_IF,LITERAL_ELSE"/>
  </module>
  <module name="UnnecessaryParentheses"/>
</module>
```

# TREE WALKER

```
int a = 10;
```

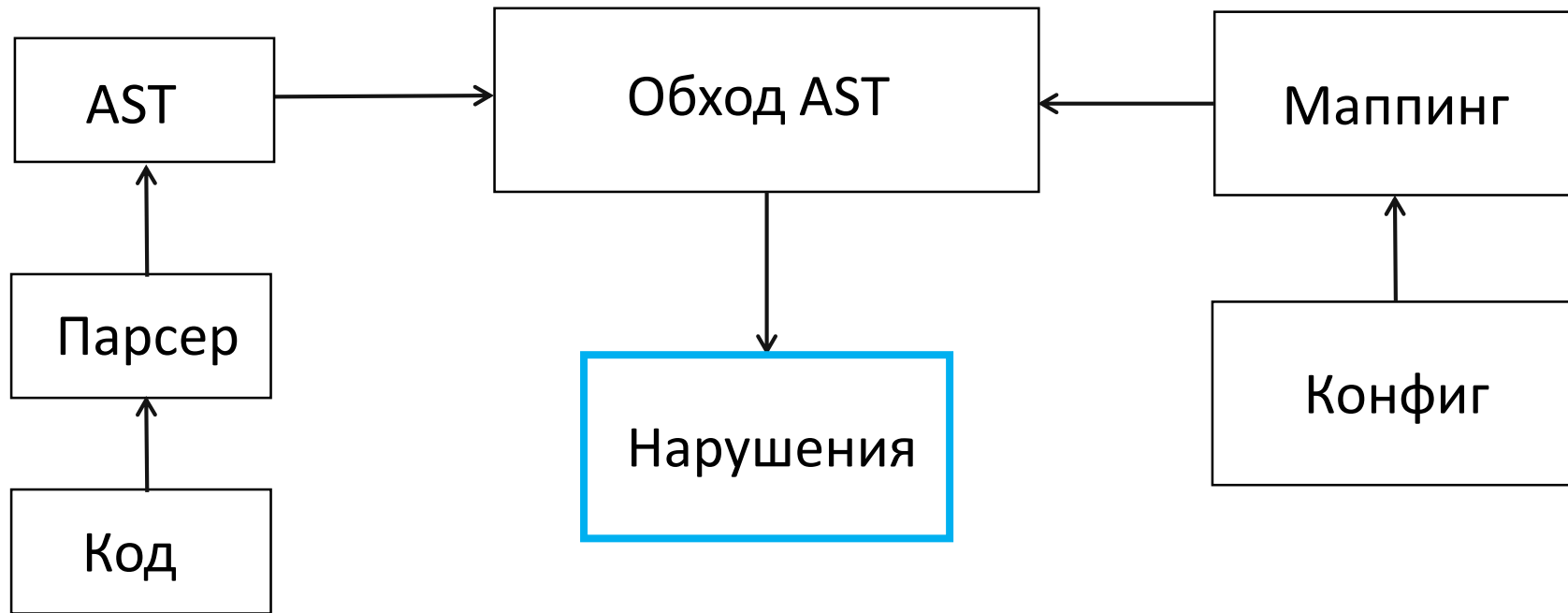


```
<module name="UnnecessaryParentheses" />
<module name="MagicNumber" />
<module name="LocalVariableName" />
```



# OVERVIEW

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# VIOLATION FILTERING

---

## Комменты (+ конфиг)

```
<module name="SuppressionCommentFilter">  
  <property name="offCommentFormat" value="turn off"/>  
  <property name="onCommentFormat" value="turn on"/>  
</module>
```

```
// turn off  
class ThisClassIsSkipped {  
}  
// turn on
```

# VIOLATION FILTERING

---

Отдельный xml конфиг

```
<suppressions>
  <suppress-xpath checks="NeedBraces"
    query="/CLASS_DEF[./IDENT[@text='ClassA']]'/>

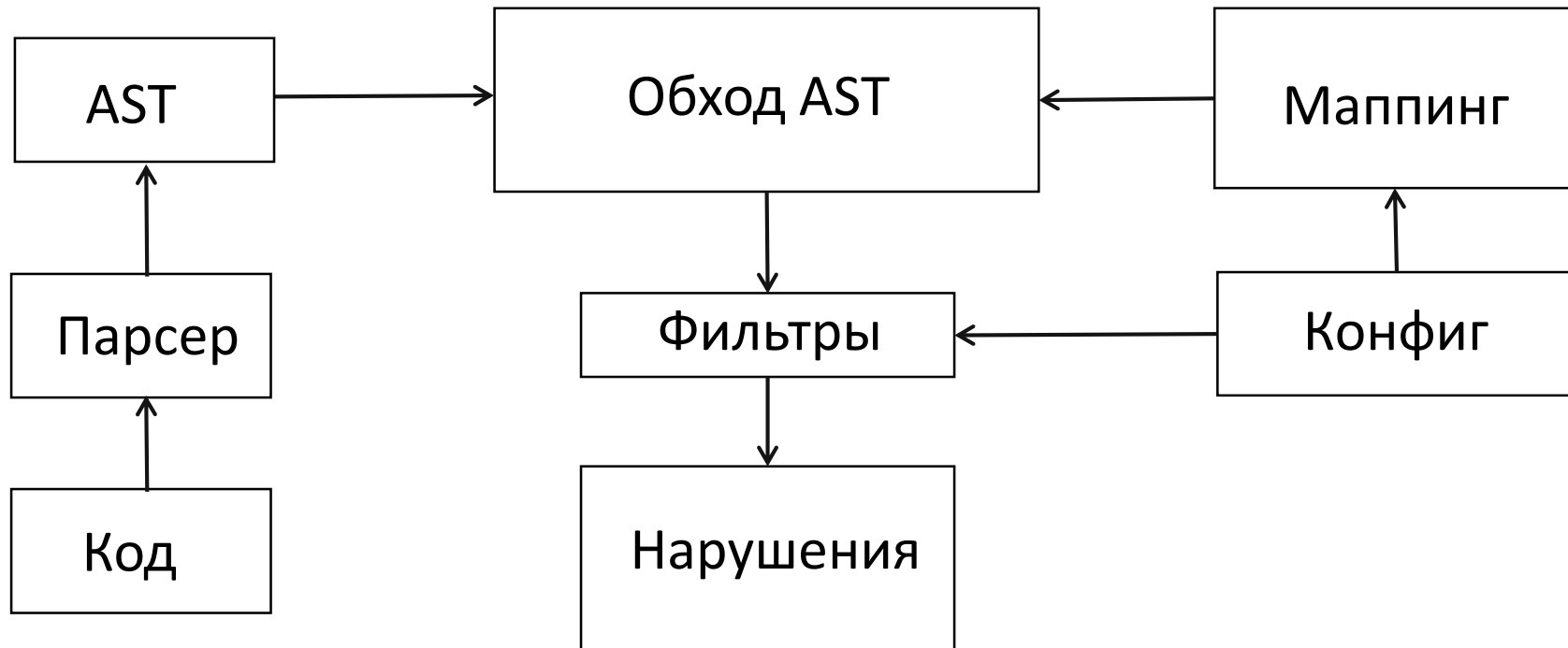
  <!-- Здесь мой комментарий -->
  <suppress checks="NeedBraces" files="MyClass.java"
    lines="11,15"/>

</suppressions>
```



# OVERVIEW

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# LIMITATIONS

---

```
class Hello {  
    public static void main(String @Nullable... args) {  
        System.out.println("Hello world!");  
    }  
}
```

com.puppcrawl.tools.checkstyle.api.CheckstyleException:  
Unexpected character 0xa6 in identifier

[https://github.com/google/guava/blob/master/guava/src/com/google/common/  
base/Verify.java#L122](https://github.com/google/guava/blob/master/guava/src/com/google/common/base/Verify.java#L122)

# LIMITATIONS

---

```
class Hello {  
    public static void main(String[] args) {  
        val name = "John Doe"; // final?  
        var obj = new LinkedList<>(); // нет типа  
        // бесполезный каст  
        Object str = (Object) obj.toString();  
    }  
    // неиспользуемый метод  
    public void get(int index) { /* some code */ }  
}
```

# PROJECT SETUP

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Кодстайл, гугл конфиг

Форматтер

Минимум подавлений + ревью

Сгенерировать файл подавлений

```
java -jar checkstyle.jar -g -c conf.xml Test.java
```

Посмотреть на AST

```
java -jar checkstyle.jar -t MyClass.java
```

```
java -jar checkstyle.jar -T MyClass.java
```

# CI CONFIG

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Нарушение -> билд падает

Warn-проверки

```
<module name="MethodLength">
  <property name="id" value="MethodLength_Warning"/>
  <property name="max" value="40"/>
  <property name="severity" value="WARN"/>
</module>
<module name="MethodLength">
  <property name="id" value="MethodLength_Error"/>
  <property name="max" value="50"/>
  <property name="severity" value="ERROR"/>
</module>
```

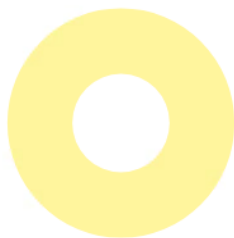
# CI CONFIG - WARNINGS-NG PLUGIN

## CheckStyle Warnings

### Overview

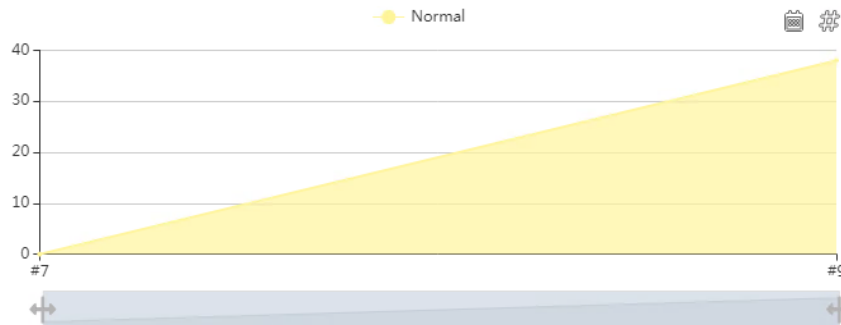


#### Severities Distribution



High Normal Low

### History



### Details

Packages Files Issues

Show 10 entries

Search:



# CUSTOM CHECKS

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SevNTU-checkstyle

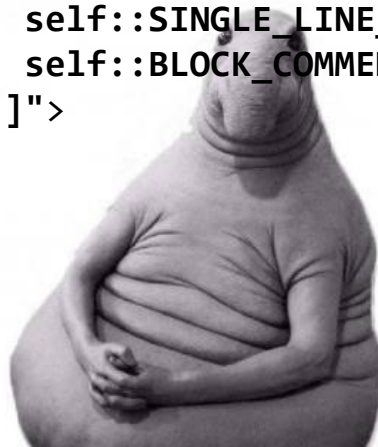
Checkstyle add-ons

Своя проверка

GenericXpathCheck

Новый тикет

```
<module name="XPath"
  query="//INSTANCE_INIT[not(../*[not(
    self::LCURLY or
    self::INSTANCE_INIT or
    self::RCURLY or
    self::SINGLE_LINE_COMMENT or
    self::BLOCK_COMMENT_BEGIN
  ])]">
</module>
```



# LINKS

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<https://checkstyle.sourceforge.io/>

Google config [https://github.com/checkstyle/checkstyle/blob/master/src/main/resources/google\\_checks.xml](https://github.com/checkstyle/checkstyle/blob/master/src/main/resources/google_checks.xml)

Checkstyle addons <https://checkstyle-addons.thomasjensen.com/>

Antlr <https://www.antlr.org/>

Generic Xpath Check <https://github.com/checkstyle/checkstyle/issues/648>

Google code style <https://google.github.io/styleguide/javaguide.html>

Warnings-ng plugin <https://github.com/jenkinsci/warnings-ng-plugin>

SevNTU <https://github.com/sevntu-checkstyle/sevntu.checkstyle>



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