Get 'em before they get you

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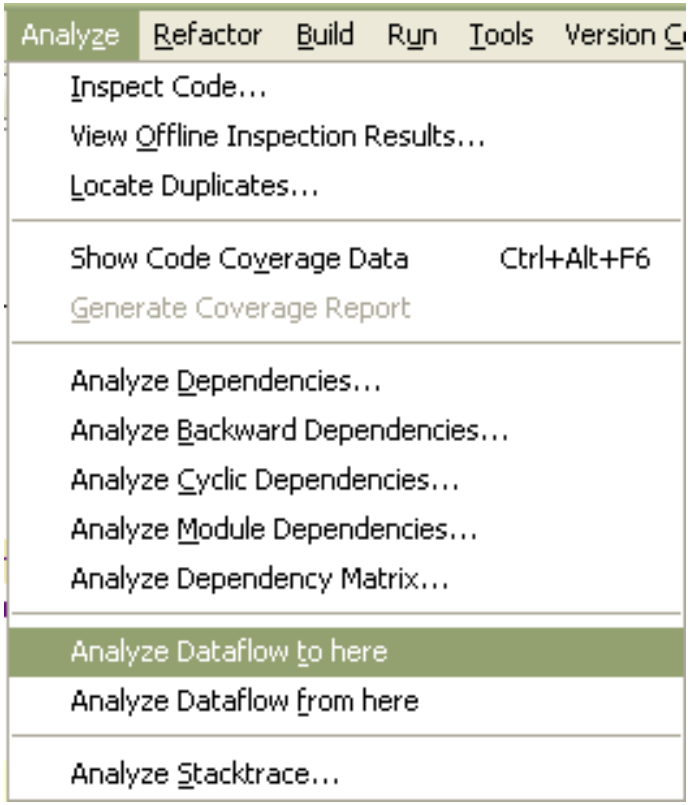
Agenda

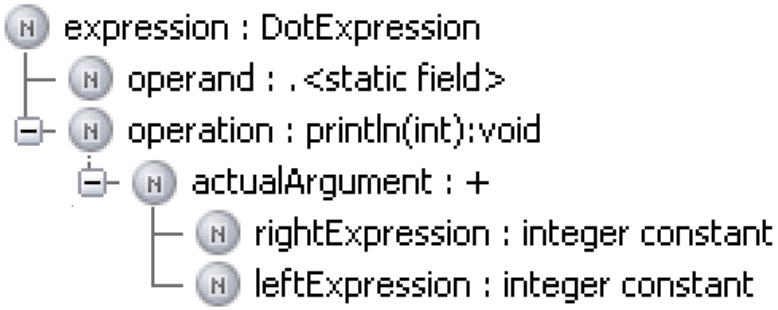
- Static Code Analysis
- Duplicate Detection
- Stacktrace Analysis
- Dataflow Analysis
- Dependency Analysis
- DSM



Static Code Analysis

- Searches AST for bug patterns
  - On demand
  - On the fly

Abstract Syntax Tree



Main | main | MultiTuple

```
<<constructor>>
<<methods>>
public static void main(String[] args) {
  System.out.println(2 + 2);
}
```

Advanced capabilities

- Quick fixes
- Profiles
- Suppressing false positives
- Spell-checker
- Command-line and CI integration

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There's more than Java out there

- JavaScript
- CSS, HTML, XML
- GWT, Struts
- EE, ME

```
.prodname span {
    display: block;
    margin: -3px 0 0 0;
    padding: 0;
    font-size: 0.8em;
    font-weight: normal;
    font-size: 70%;
}
```

Property font-size is overwritten

```
var selectedQuantityIndex = volumeQuantities.length - 1;
if ((quantity == null) || (isNaN(quantity))) {
```

Comparison quantity == null may cause unexpected type coercion

722

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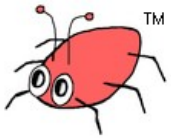


Create your own bug patterns

Define

an AST sub-tree to search for

an AST sub-tree to replace it with

Helper annotations - JSR 305 & 308

- @Nullable, @NotNull, @Nls, @NonNls
- @PropertyKey, @Pattern, @Language
- @ThreadSafe, @GuardedBy
- @Immutable

@Pattern

```
abstract class Tool {
    @Pattern("[a-zA-Z_0-9]+")
    abstract String getId();
}

class MyTool extends Tool {
    String getId() {
        return "ID (Not Valid)";
    }
}
```

Expression 'ID (Not Valid)' doesn't match pattern: [a-zA-Z_0-9]+ more... (Ctrl+F1)

Language injection

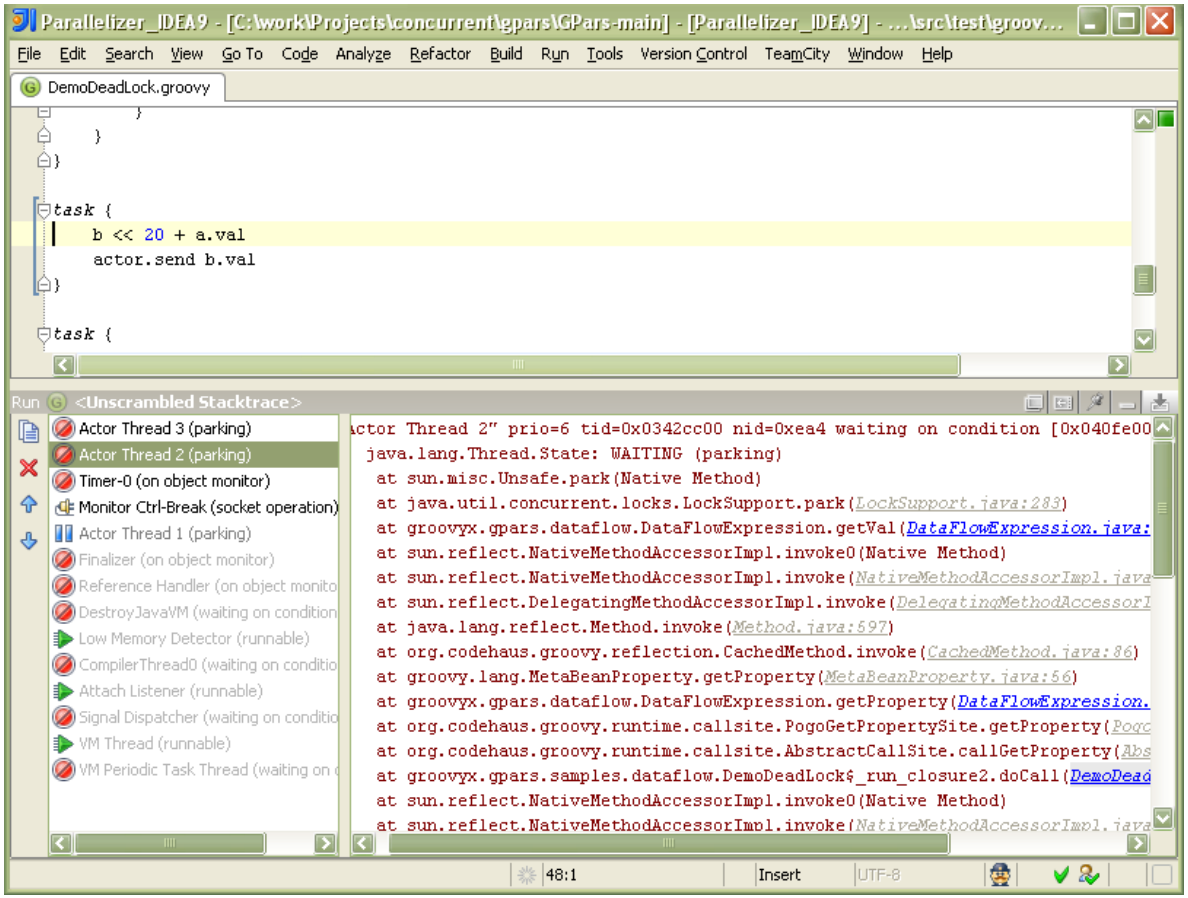
```
@Language("CSS")
String cssDemo = "h2 { font-style: italic; }";

@Language("RegExp")
String regexpDemo = "\\p{Alpha}(abc)\\1\\2";

@Language("HTML")
String xmlDemo = "<head><title>Test</title></hed>";
```

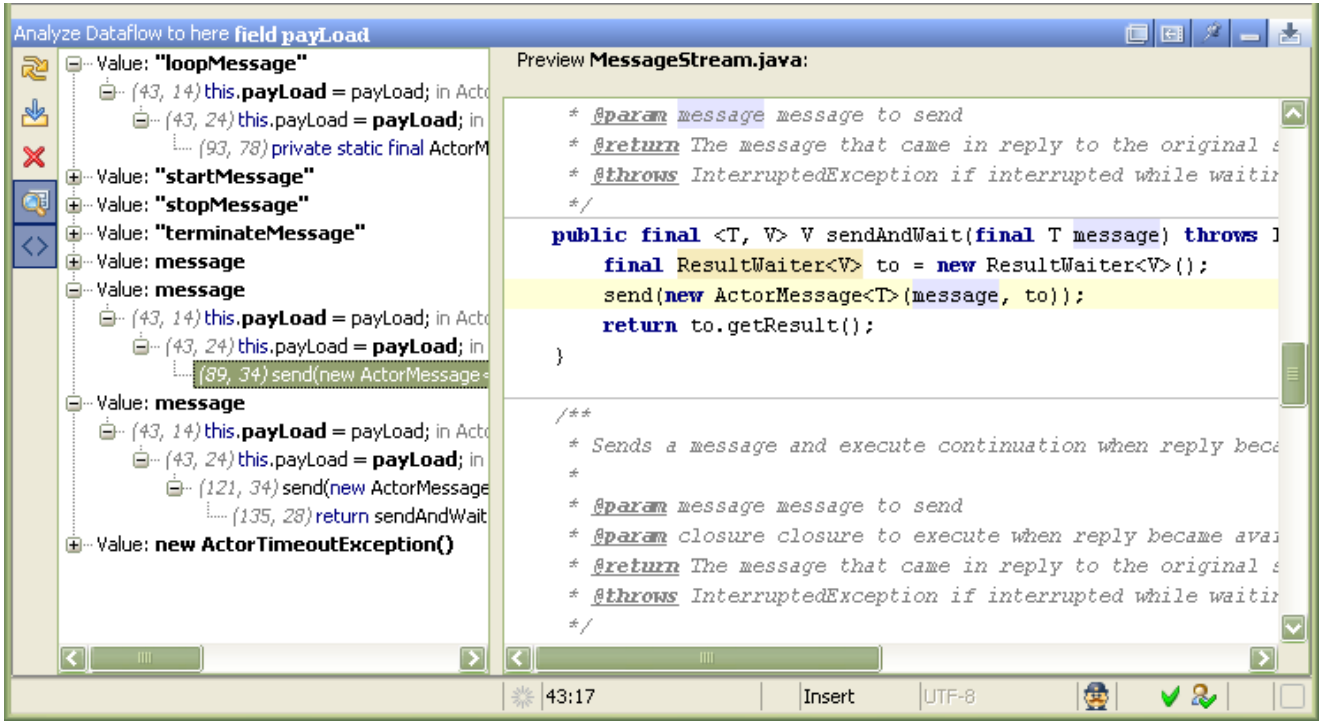
Unresolved backreference

Stacktrace Analysis



Dataflow Analysis

- From / To here



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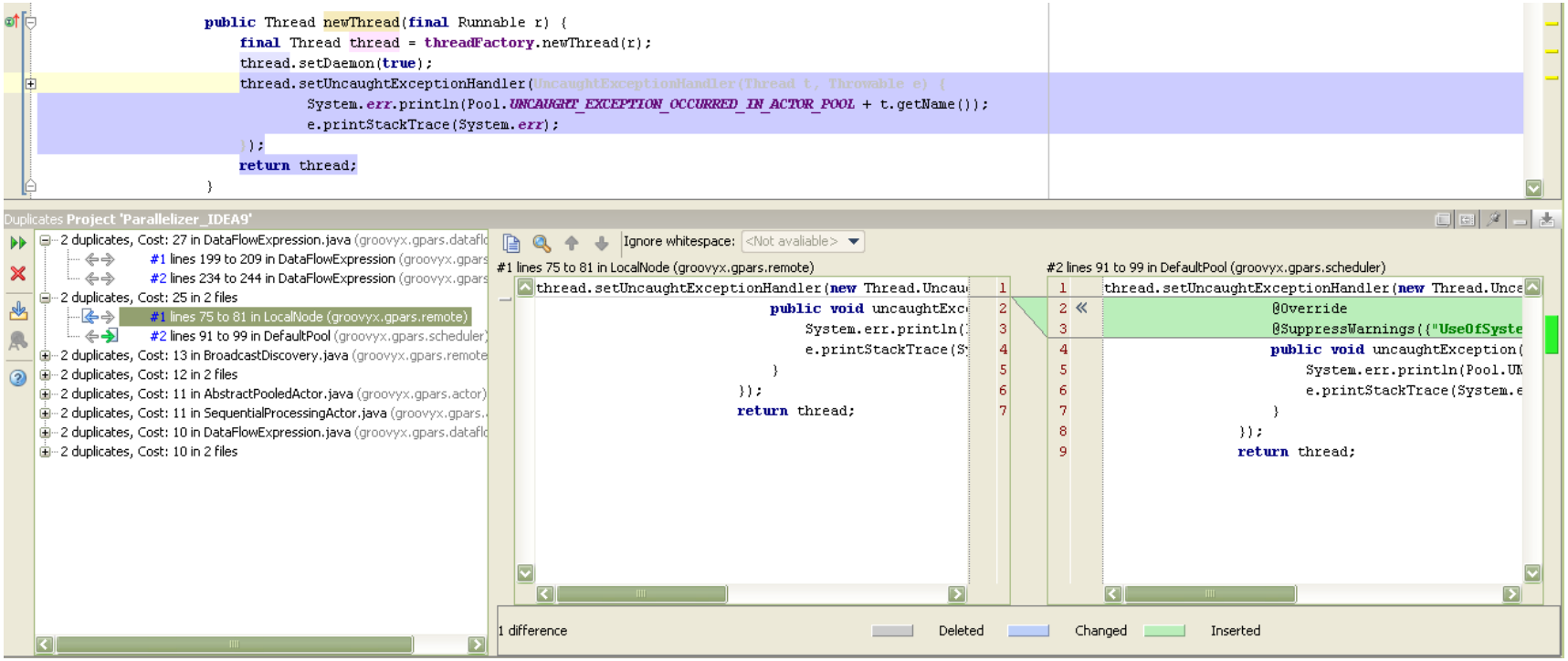
Duplicate detection



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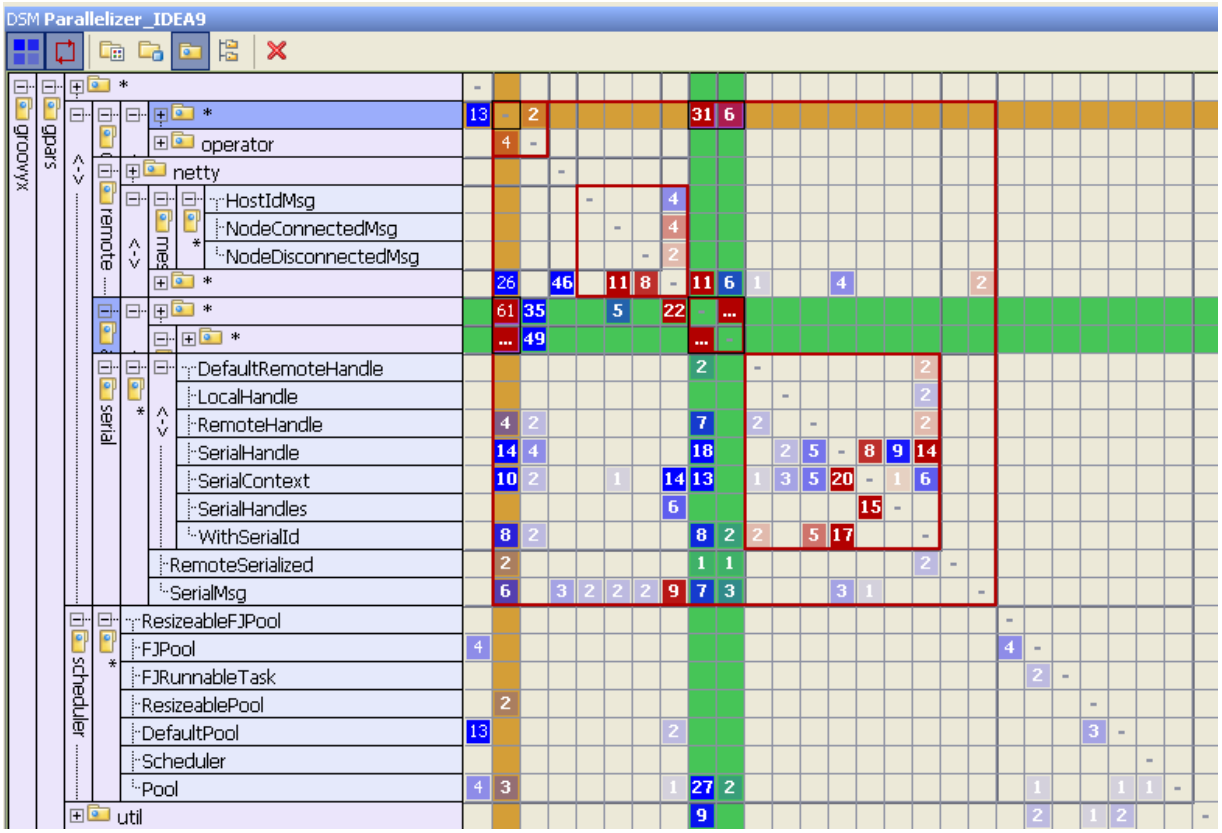
Dependency Structure Matrix



Summary

- Customize
- Use permanently
- Run continuously

So that you can sleep better!

Questions