The Patches of the Nopol Automatic Repair System on the Bugs of Defects4J version 1.1.0

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To cite this version:

Thomas Durieux, Benjamin Danglot, Zhongxing Yu, Matias Martinez, Simon Urli, et al.. The Patches of the Nopol Automatic Repair System on the Bugs of Defects4J version 1.1.0. [Research Report] hal-01480084, Université Lille 1 - Sciences et Technologies. 2017. hal-01480084

HAL Id: hal-01480084
https://hal.archives-ouvertes.fr/hal-01480084
Submitted on 7 Mar 2017

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The Patches of the Nopol Automatic Repair System on the Bugs of Defects4J version 1.1.0

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Technical report hal-01480084
https://hal.archives-ouvertes.fr/hal-01480084

This report lists the test-suite adequate patches found by the Nopol automatic repair system [3] on version 1.1.0 of the Defects4J benchmark of bugs [2]. In total, Nopol finds a test-suite adequate patches for 103 different bugs, as shown in Table 1.

To refer to this document:

@techreport{techrepNopolDefects4j2017,
  TITLE = {{The Patches of the Nopol Automatic Repair System on the Bugs of Defects4J version 1.1.0}},
  AUTHOR = {Durieux, Thomas and Danglot, Benjamin and Zu, Zhongxing and Martinez, Matias and Monperrus, Martin},
  URL = {https://hal.archives-ouvertes.fr/hal-01480084},
  INSTITUTION = {{Université de Lille}},
  YEAR = {2017},
  NUMBER = {hal-01480084},
}

We the Oracle JDK 1.7.0 _7 to run Nopol and OpenJDK 1.8.0 for compiling the project Mockito. We give a time budget of three hours to Nopol to find a patch. The experiment has been conducted on machines that are equipped of Xeon X3440 Quad-core processor and 15GB RAM, the machines are part of the Grid5000 infrastructure [1].

Reproduction information:

• Nopol source code: https://github.com/SpoonLabs/nopol/
  Commit used: 473b6e2dc5c668517bd45be1d878074858eb934f

• Defects4j version: https://github.com/rjust/defects4j/releases/tag/v1.1.0/

• Execution traces: https://github.com/Spirals-Team/defects4j-repair/tree/master/results/2017-march/

1 Chart

Nopol repairs 9 bugs in the project Chart.

1.1 Chart 3

--- /tmp/chart_3_Nopol/source/org/jfree/data/time/TimeSeries.java
+++ /tmp/chart_3_Nopol/source/org/jfree/data/time/TimeSeries.java
@@ -884,3 +884,3 @@
-    if (removed) {
+    if (removed) {

Table 1: The number of synthesized test-suite adequate patches for each project.

<table>
<thead>
<tr>
<th>Project</th>
<th># Patches</th>
<th># Bugs</th>
<th>Repair Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chart</td>
<td>9</td>
<td>26</td>
<td>37%</td>
</tr>
<tr>
<td>Closure</td>
<td>56</td>
<td>133</td>
<td>42%</td>
</tr>
<tr>
<td>Lang</td>
<td>4</td>
<td>65</td>
<td>6%</td>
</tr>
<tr>
<td>Math</td>
<td>24</td>
<td>106</td>
<td>22%</td>
</tr>
<tr>
<td>Mockito</td>
<td>2</td>
<td>38</td>
<td>5%</td>
</tr>
<tr>
<td>Time</td>
<td>8</td>
<td>27</td>
<td>29%</td>
</tr>
<tr>
<td>Total</td>
<td>103</td>
<td>395</td>
<td>26%</td>
</tr>
</tbody>
</table>

Listing 1: "The generated patch for the bug Chart 3"

Number of tests that execute the patch: 86
Execution time: 50 seconds

1.2 Chart 4

--- /tmp/chart_4_Nopol/source/org/jfree/chart/plot/XYPlot.java
+++ /tmp/chart_4_Nopol/source/org/jfree/chart/plot/XYPlot.java
@@ -1606,3 +1606,5 @@
     public void setRenderer(XYItemRenderer renderer) {
         setRenderer(0, renderer);
         if (renderer!=null) {
             setRenderer(0, renderer);
         }
     }

Listing 2: "The generated patch for the bug Chart 4"

Number of tests that execute the patch: 18
Execution time: 7 minutes, 32 seconds

1.3 Chart 5

--- /tmp/chart_5_Nopol/source/org/jfree/data/xy/XYSeries.java
+++ /tmp/chart_5_Nopol/source/org/jfree/data/xy/XYSeries.java
@@ -562,3 +562,3 @@
     // append the value to the list...
     if (this.autoSort) {
         if (overwritten!=null) {
             this.data.add(-index - 1, new XYDataItem(x, y));
         }
     }

Listing 3: "The generated patch for the bug Chart 5"

Number of tests that execute the patch: 6
Execution time: 38 seconds

1.4 Chart 9

--- /tmp/chart_9_Nopol/source/org/jfree/data/time/TimeSeries.java
+++ /tmp/chart_9_Nopol/source/org/jfree/data/time/TimeSeries.java
@@ -882,3 +882,5 @@
     if (end < start) {
         throw new IllegalArgumentException("Requires start <= end.");
         TimeSeries.this.range.length()) { 
             throw new IllegalArgumentException("Requires start <= end.");
         }
     }

Listing 4: "The generated patch for the bug Chart 9"

Number of tests that execute the patch: 4
Execution time: 34 seconds

1.5 Chart 13
Number of tests that execute the patch: 2
Execution time: 42 seconds

1.6 Chart 17

Listing 5: "The generated patch for the bug Chart 13"

Number of tests that execute the patch: 4
Execution time: 33 seconds

1.7 Chart 21

Listing 6: "The generated patch for the bug Chart 17"

Number of tests that execute the patch: 12
Execution time: 37 seconds

1.8 Chart 25

Listing 7: "The generated patch for the bug Chart 21"

Number of tests that execute the patch: 12
Execution time: 37 seconds
Listing 8: "The generated patch for the bug Chart 25"
Number of tests that execute the patch: 10
Execution time: 33 seconds

1.9 Chart 26

Listing 9: "The generated patch for the bug Chart 26"
Number of tests that execute the patch: 48
Execution time: 1 minute, 40 seconds

2 Closure

Nopol repairs 56 bugs in the project Closure.

2.1 Closure 1

Listing 10: "The generated patch for the bug Closure 1"
Number of tests that execute the patch: 15
Execution time: 2 minutes, 4 seconds

2.2 Closure 2

Listing 11: "The generated patch for the bug Closure 2"
Number of tests that execute the patch: 17
Execution time: 2 minutes, 7 seconds

2.3 Closure 3
Listing 12: "The generated patch for the bug Closure 3"

Number of tests that execute the patch: 10
Execution time: 7 minutes, 8 seconds

2.4 Closure 5

Listing 13: "The generated patch for the bug Closure 5"

Number of tests that execute the patch: 8
Execution time: 1 minute, 51 seconds

2.5 Closure 7

Listing 14: "The generated patch for the bug Closure 7"

Number of tests that execute the patch: 358
Execution time: 3 minutes, 26 seconds

2.6 Closure 8
Listing 15: "The generated patch for the bug Closure 8"

Number of tests that execute the patch: 8
Execution time: 2 minutes, 28 seconds

2.7 Closure 10

Listing 16: "The generated patch for the bug Closure 10"

Number of tests that execute the patch: 8
Execution time: 4 minutes, 28 seconds

2.8 Closure 12

Listing 17: "The generated patch for the bug Closure 12"

Number of tests that execute the patch: 8
Execution time: 7 minutes, 35 seconds

2.9 Closure 14

Listing 18: "The generated patch for the bug Closure 14"

Number of tests that execute the patch: 7
Execution time: 3 minutes, 2 seconds

2.10 Closure 15

--- /tmp/closure_15_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_15_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1429,7 +1429,9 @@
    if (diff != null) {
        return "Node tree inequality:" +
        "\nTree1:\n" + toStringTree() +
    "\nSubtree1:
" + diff.nodeA.toStringTree() +
    "\nSubtree2:
" + diff.nodeB.toStringTree();
+    if (com.google.javascript.rhino.Node.this.type < 32) {
+        return "Node tree inequality:" +
+        "\nTree1:\n" + toStringTree() +
+        "\nSubtree1:
" + diff.nodeA.toStringTree() +
+        "\nSubtree2:
" + diff.nodeB.toStringTree();
    }
}

Listing 19: "The generated patch for the bug Closure 15"

Number of tests that execute the patch: 8
Execution time: 7 minutes, 28 seconds

2.11 Closure 16

--- /tmp/closure_16_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_16_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1445,3 +1445,5 @@
    if (!isEquivalentTo(node2, false, false)) {
-        return new NodeMismatch(this, node2);
+        if (com.google.javascript.rhino.Node.this.sourcePosition <= 1) {
+            return new NodeMismatch(this, node2);
+        }
    }

Listing 20: "The generated patch for the bug Closure 16"

Number of tests that execute the patch: 12
Execution time: 4 minutes, 12 seconds

2.12 Closure 17

--- /tmp/closure_17_Nopol/src/com/google/javascript/jscomp/TypedScopeCreator.java
+++ /tmp/closure_17_Nopol/src/com/google/javascript/jscomp/TypedScopeCreator.java
@@ -1294,3 +1294,5 @@
    // then we can safely use that.
    return rValue.getJSType();
+    if (!(com.google.javascript.jscomp.TypedScopeCreator.DELEGATE_PROXY_SUFFIX.
         length() == -1 + com.google.javascript.jscomp.TypedScopeCreator.this.
         functionAnalysisResults.size())) {
+        return rValue.getJSType();
+    }
} else if (rValue.isOr()) {

Listing 21: "The generated patch for the bug Closure 17"

Number of tests that execute the patch: 25
Execution time: 2 minutes, 1 second

2.13 Closure 18

--- /tmp/closure_18_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_18_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1429,7 +1429,9 @@
    if (diff != null) {
        return "Node tree inequality:" +
        "\nTree1:\n" + toStringTree() +
    "\nSubtree1:
" + diff.nodeA.toStringTree() +
    "\nSubtree2:
" + diff.nodeB.toStringTree();
+    if (com.google.javascript.rhino.Node.this.type < JS_DISPATCHER) {
+        return "Node tree inequality:" +
+        "\nTree1:\n" + toStringTree() +
+        "\nSubtree1:
" + node2.toStringTree() +
+        "\nSubtree2:
" + node2.toStringTree();
+    }

Listing 22: "The generated patch for the bug Closure 18"

Number of tests that execute the patch: 1
Execution time: 2 minutes, 1 second
Number of tests that execute the patch: 8
Execution time: 1 minute, 51 seconds

2.14 Closure 20

```
--- /tmp/closure_20_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_20_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1429,7 +1429,9 @@
     if (diff != null) {
         return "Node tree inequality:" +
         "\nTree1:\n" + toStringTree() +
-        "\nTree2:\n" + node2.toStringTree() +
-        "\nSubtree1: " + diff.nodeA.toStringTree() +
-        "\nSubtree2: " + diff.nodeB.toStringTree();
+        if (com.google.javascript.rhino.Node.this.type < 32) {
+            return "Node tree inequality:" +
+            "\nTree1:\n" + toStringTree() +
+            "\nTree2:\n" + node2.toStringTree() +
+            "\nSubtree1: " + diff.nodeA.toStringTree() +
+            "\nSubtree2: " + diff.nodeB.toStringTree();
     }
 }
```

Listing 23: "The generated patch for the bug Closure 20"

Number of tests that execute the patch: 8
Execution time: 2 minutes

2.15 Closure 21

```
--- /tmp/closure_21_Nopol/src/com/google/javascript/jscomp/CheckSideEffects.java
+++ /tmp/closure_21_Nopol/src/com/google/javascript/jscomp/CheckSideEffects.java
@@ -117,7 +117,9 @@
     if (n == parent.getLastChild()) {
         for (Node an : parent.getAncestors()) {
             ancestorType = an.getType();
-            if (ancestorType == Token.COMMA) continue;
-            if (ancestorType != Token.EXPR_RESULT && ancestorType != Token.BLOCK) return;
+            if (com.google.javascript.jscomp.CheckSideEffects.PROTECTOR_FN.length() ==0) {
+                for (Node an : parent.getAncestors()) {
+                    ancestorType = an.getType();
+                    if (ancestorType == Token.COMMA) continue;
+                    if (ancestorType != Token.EXPR_RESULT && ancestorType != Token.BLOCK) return;
+                    else break;
+                }
+            } else break;
     }
 }
```

Listing 24: "The generated patch for the bug Closure 21"

Number of tests that execute the patch: 3
Execution time: 1 minute, 59 seconds

2.16 Closure 22

```
--- /tmp/closure_22_Nopol/src/com/google/javascript/jscomp/CheckSideEffects.java
+++ /tmp/closure_22_Nopol/src/com/google/javascript/jscomp/CheckSideEffects.java
@@ -115,6 +115,8 @@
         }
     }
 }
-    if (ancestorType != Token.EXPR_RESULT && ancestorType != Token.BLOCK) continue;
+    if (com.google.javascript.jscomp.CheckSideEffects.PROTECTOR_FN.length() ==0) {
+        if (ancestorType != Token.EXPR_RESULT && ancestorType != Token.BLOCK) return;
+    }
 }
```

Listing 25: "The generated patch for the bug Closure 22"

Number of tests that execute the patch: 3
2.17 Closure 26

Listing 26: "The generated patch for the bug Closure 26"

Number of tests that execute the patch: 14
Execution time: 3 minutes, 34 seconds

2.18 Closure 28

Listing 27: "The generated patch for the bug Closure 28"

Number of tests that execute the patch: 8
Execution time: 1 minute, 55 seconds

2.19 Closure 29

Listing 28: "The generated patch for the bug Closure 29"

Number of tests that execute the patch: 12
Execution time: 2 minutes
Number of tests that execute the patch: 5
Execution time: 1 minute, 45 seconds

2.21 Closure 31

Listing 30: "The generated patch for the bug Closure 31"

Number of tests that execute the patch: 3
Execution time: 1 minute, 54 seconds

2.22 Closure 33

Listing 31: "The generated patch for the bug Closure 33"

Number of tests that execute the patch: 8
Execution time: 1 minute, 52 seconds

2.23 Closure 35
+    if ((fieldName.length()) != (5)) {
+      if (builder.addProperty(fieldName, fieldType, fieldNameNode) == null) {
+        // Duplicate field name, warning and skip
+        reporter.warning("Duplicate record field " + fieldName,
+                       sourceName,
+                       n.getLineNo(), fieldNameNode.getLineNo());
+      }
+    }
+
+Listing 32: "The generated patch for the bug Closure 35"

Number of tests that execute the patch: 26
Execution time: 2 minutes, 43 seconds

2.24 Closure 36

--- /tmp/closure_36_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_36_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1416 ,7 +1416 ,9 @@
     if ( diff != null ) {
       return "Node tree inequality:" +
     "\nTree1:\n" + toStringTree() +
-    "\nTree2:\n" + node2.toStringTree() +
-    "\nSubtree1: " + diff.nodeA.toStringTree() +
-    "\nSubtree2: " + diff.nodeB.toStringTree();
     + if (com.google.javascript.rhino.Node.this.type <= com.google.javascript.rhino.Node.IS_DISPATCHER) {
       return "Node tree inequality:" +
     "\nTree1:\n" + toStringTree() +
-    "\nTree2:\n" + node2.toStringTree() +
-    "\nSubtree1: " + diff.nodeA.toStringTree() +
-    "\nSubtree2: " + diff.nodeB.toStringTree();
     + }
+
+Listing 33: "The generated patch for the bug Closure 36"

Number of tests that execute the patch: 3
Execution time: 1 minute, 48 seconds

2.25 Closure 38

--- /tmp/closure_38_Nopol/src/com/google/javascript/jscomp/CodeConsumer.java
+++ /tmp/closure_38_Nopol/src/com/google/javascript/jscomp/CodeConsumer.java
@@ -244 ,3 +244 ,3 @@
   boolean negativeZero = isNegativeZero(x);
-    if (x < 0 && prev == '-') {
+    if ((prev == '-')) {
      add(" ");
+
+Listing 34: "The generated patch for the bug Closure 38"

Number of tests that execute the patch: 1665
Execution time: 3 minutes, 11 seconds

2.26 Closure 40

--- /tmp/closure_40_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_40_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1411 ,7 +1411 ,9 @@
     if ( diff != null ) {
       return "Node tree inequality:" +
     "\nTree1:\n" + toStringTree() +
-    "\nTree2:\n" + node2.toStringTree() +
-    "\nSubtree1: " + diff.nodeA.toStringTree() +
-    "\nSubtree2: " + diff.nodeB.toStringTree();
     + if (com.google.javascript.rhino.Node.this.type < 32) {
       return "Node tree inequality:" +
     "\nTree1:\n" + toStringTree() +
-    "\nTree2:\n" + node2.toStringTree() +
-    "\nSubtree1: " + diff.nodeA.toStringTree() +
-    "\nSubtree2: " + diff.nodeB.toStringTree();
     + }
+
+Listing 35: "The generated patch for the bug Closure 40"
Number of tests that execute the patch: 3
Execution time: 2 minutes, 7 seconds

2.27 Closure 45

```
--- /tmp/closure_45_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_45_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1403,7 +1403,9 @@
    if (diff != null) {
        return "Node tree inequality:" +
        "\nTree1:\n" + toStringTree() +
-       "\nTree2:\n" + node2.toStringTree() +
-       "\nSubtree1: " + diff.nodeA.toStringTree() +
-       "\nSubtree2: " + diff.nodeB.toStringTree();
+       if (com.google.javascript.rhino.Node.this.type < 32) {
+         return "Node tree inequality:" +
+         "\nTree1:\n" + toStringTree() +
+         "\nTree2:\n" + node2.toStringTree() +
+         "\nSubtree1: " + diff.nodeA.toStringTree() +
+         "\nSubtree2: " + diff.nodeB.toStringTree();
    }
}
```

Listing 36: "The generated patch for the bug Closure 45"

Number of tests that execute the patch: 3
Execution time: 1 minute, 41 seconds

2.28 Closure 49

```
--- /tmp/closure_49_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_49_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1566,7 +1566,9 @@
    if (diff != null) {
        return "Node tree inequality:" +
        "\nTree1:\n" + toStringTree() +
-       "\nTree2:\n" + node2.toStringTree() +
-       "\nSubtree1: " + diff.nodeA.toStringTree() +
-       "\nSubtree2: " + diff.nodeB.toStringTree();
+         LABEL_PROP) {
+         return "Node tree inequality:" +
+         "\nTree1:\n" + toStringTree() +
+         "\nTree2:\n" + node2.toStringTree() +
+         "\nSubtree1: " + diff.nodeA.toStringTree() +
+         "\nSubtree2: " + diff.nodeB.toStringTree();
    }
}
```

Listing 37: "The generated patch for the bug Closure 49"

Number of tests that execute the patch: 68
Execution time: 1 minute, 47 seconds

2.29 Closure 50

```
--- /tmp/closure_50_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_50_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1566,7 +1566,9 @@
    if (diff != null) {
        return "Node tree inequality:" +
        "\nTree1:\n" + toStringTree() +
-       "\nTree2:\n" + node2.toStringTree() +
-       "\nSubtree1: " + diff.nodeA.toStringTree() +
-       "\nSubtree2: " + diff.nodeB.toStringTree();
+         LABEL_PROP) {
+         return "Node tree inequality:" +
+         "\nTree1:\n" + toStringTree() +
+         "\nTree2:\n" + node2.toStringTree() +
+         "\nSubtree1: " + diff.nodeA.toStringTree() +
+         "\nSubtree2: " + diff.nodeB.toStringTree();
    }
}
```

Listing 38: "The generated patch for the bug Closure 50"

Number of tests that execute the patch: 4
Execution time: 1 minute, 50 seconds

2.30 Closure 55
Listing 39: "The generated patch for the bug Closure 55"

Number of tests that execute the patch: 11
Execution time: 2 minutes, 14 seconds

2.31 Closure 60

Listing 40: "The generated patch for the bug Closure 60"

Number of tests that execute the patch: 31
Execution time: 12 minutes, 12 seconds

2.32 Closure 61

Listing 41: "The generated patch for the bug Closure 61"

Number of tests that execute the patch: 4
Execution time: 1 minute, 39 seconds

2.33 Closure 62
+ if (error != null) {
  for (int i = 0; i < charno; i++) {

Listing 42: "The generated patch for the bug Closure 62"

Number of tests that execute the patch: 5
Execution time: 1 minute, 32 seconds

2.34 Closure 63

--- /tmp/closure_63_Nopol/src/google/javascript/jscomp/LightweightMessageFormatter.java
+++ /tmp/closure_63_Nopol/src/google/javascript/jscomp/LightweightMessageFormatter.java
@@ -96,4 +96,3 @@
  // at the end of the line
  if (excerpt.equals(LINE)) {
    if (error != null) {
for (int i = 0; i < charno; i++) {

Listing 43: "The generated patch for the bug Closure 63"

Number of tests that execute the patch: 5
Execution time: 1 minute, 31 seconds

2.35 Closure 66

--- /tmp/closure_66_Nopol/src/google/javascript/jscomp/TypeCheck.java
+++ /tmp/closure_66_Nopol/src/google/javascript/jscomp/TypeCheck.java
@@ -821,3 +821,5 @@
  if (type == null) {
    nullCount++; 
    if (com.google.jscomp.TypeCheck.this.inExterns) {
+      nullCount++; 
+    }
  } else if (type.isUnknownType()) {

Listing 44: "The generated patch for the bug Closure 66"

Number of tests that execute the patch: 166
Execution time: 2 minutes, 21 seconds

2.36 Closure 67

--- /tmp/closure_67_Nopol/src/google/javascript/rhino/Node.java
+++ /tmp/closure_67_Nopol/src/google/javascript/rhino/Node.java
@@ -1384,7 +1384,9 @@
  if (diff != null) {
    return "Node tree inequality:" +
-    "\nTree1:\n" + toStringTree() +
-    "\nTree2:\n" + node2.toStringTree() +
-    "\nSubtree1: " + diff.nodeA.toStringTree() +
-    "\nSubtree2: " + diff.nodeB.toStringTree();
+    if ((com.google.jscomp.Node.this.type) != (node2.type)) {
+      return "Node tree inequality:" +
+        "\nTree1:\n" + toStringTree() +
+        "\nTree2:\n" + node2.toStringTree() +
+        "\nSubtree1: " + diff.nodeA.toStringTree() +
+        "\nSubtree2: " + diff.nodeB.toStringTree();
+  }

Listing 45: "The generated patch for the bug Closure 67"

Number of tests that execute the patch: 2
Execution time: 1 minute, 37 seconds

2.37 Closure 72

--- /tmp/closure_72_Nopol/src/google/javascript/rhino/Node.java
+++ /tmp/closure_72_Nopol/src/google/javascript/rhino/Node.java
@@ -1381,7 +1381,9 @@
  if (diff != null) {
    return "Node tree inequality:" +
-    "\nTree1:\n" + toStringTree() +
-    "\nTree2:\n" + node2.toStringTree() +
-    "\nSubtree1: " + diff.nodeA.toStringTree() +
-    "\nSubtree2: " + diff.nodeB.toStringTree();
+    if ((com.google.jscomp.Node.this.type) != (node2.type)) {
+      return "Node tree inequality:" +
+        "\nTree1:\n" + toStringTree() +
+        "\nTree2:\n" + node2.toStringTree() +
+        "\nSubtree1: " + diff.nodeA.toStringTree() +
+        "\nSubtree2: " + diff.nodeB.toStringTree();
+  }

Listing 46: "The generated patch for the bug Closure 72"
Listing 46: "The generated patch for the bug Closure 72"
Number of tests that execute the patch: 2
Execution time: 1 minute, 32 seconds

2.38 Closure 75

Listing 47: "The generated patch for the bug Closure 75"
Number of tests that execute the patch: 3164
Execution time: 24 minutes, 1 second

2.39 Closure 76

Listing 48: "The generated patch for the bug Closure 76"
Number of tests that execute the patch: 5
Execution time: 1 minute, 30 seconds

2.40 Closure 78

Listing 49: "The generated patch for the bug Closure 78"
Number of tests that execute the patch: 1
Execution time: 1 minute, 25 seconds

2.41 Closure 111
+ if (message != null) {
    return;
}

Listing 50: "The generated patch for the bug Closure 111"

Number of tests that execute the patch: 381
Execution time: 2 minutes, 49 seconds

2.42 Closure 113

--- /tmp/closure_113_Nopol/src/com/google/javascript/jscomp/ProcessClosurePrimitives.java
+++ /tmp/closure_113_Nopol/src/com/google/javascript/jscomp/ProcessClosurePrimitives.java
@@ -328,3 +328,3 @@
-     // let them be caught in the subsequent run.
+     if ((provided != null) || (ns.length() < 10)) {
   parent.detachFromParent();

Listing 51: "The generated patch for the bug Closure 113"

Number of tests that execute the patch: 26
Execution time: 2 minutes, 22 seconds

2.43 Closure 114

--- /tmp/closure_114_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_114_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1429,7 +1429,9 @@
-     if (diff != null) {
-         return "Node tree inequality:" +
-           "\nTree1:\n" + toStringTree() +
-           "\nTree2:\n" + node2.toStringTree() +
-           "\nSubtree1: " + diff.nodeA.toStringTree() +
-           "\nSubtree2: " + diff.nodeB.toStringTree();
+     if (node2.type < com.google.javascript.rhino.Node.JSDOC_INFO_PROP) {
+         return "Node tree inequality:" +
+           "\nTree1:\n" + toStringTree() +
+           "\nTree2:\n" + node2.toStringTree() +
+           "\nSubtree1: " + diff.nodeA.toStringTree() +
+           "\nSubtree2: " + diff.nodeB.toStringTree();
+     }

Listing 52: "The generated patch for the bug Closure 114"

Number of tests that execute the patch: 8
Execution time: 2 minutes, 14 seconds

2.44 Closure 115

--- /tmp/closure_115_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_115_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1429,7 +1429,9 @@
-     if (diff != null) {
-         return "Node tree inequality:" +
-           "\nTree1:\n" + toStringTree() +
-           "\nTree2:\n" + node2.toStringTree() +
-           "\nSubtree1: " + diff.nodeA.toStringTree() +
-           "\nSubtree2: " + diff.nodeB.toStringTree();
+     if (node2.type < com.google.javascript.rhino.Node.JSDOC_INFO_PROP) {
+         return "Node tree inequality:" +
+           "\nTree1:\n" + toStringTree() +
+           "\nTree2:\n" + node2.toStringTree() +
+           "\nSubtree1: " + diff.nodeA.toStringTree() +
+           "\nSubtree2: " + diff.nodeB.toStringTree();
+     }

Listing 53: "The generated patch for the bug Closure 115"

Number of tests that execute the patch: 14
Execution time: 2 minutes, 18 seconds

2.45 Closure 116

--- /tmp/closure_116_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_116_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1429,7 +1429,9 @@
-     if (diff != null) {
-         return "Node tree inequality:" +
-           "\nTree1:\n" + toStringTree() +
-           "\nTree2:\n" + node2.toStringTree() +
-           "\nSubtree1: " + diff.nodeA.toStringTree() +
-           "\nSubtree2: " + diff.nodeB.toStringTree();
+     if (diff != null) {
+         return "Node tree inequality:" +
+           "\nTree1:\n" + toStringTree() +
+           "\nTree2:\n" + node2.toStringTree() +
+           "\nSubtree1: " + diff.nodeA.toStringTree() +
+           "\nSubtree2: " + diff.nodeB.toStringTree();
+     }

Listing 54: "The generated patch for the bug Closure 116"
2.46 Closure 119

Listing 54: "The generated patch for the bug Closure 116"

Number of tests that execute the patch: 13
Execution time: 2 minutes, 13 seconds

2.47 Closure 120

Listing 55: "The generated patch for the bug Closure 119"

Number of tests that execute the patch: 394
Execution time: 32 minutes, 2 seconds

2.48 Closure 121

Listing 56: "The generated patch for the bug Closure 120"

Number of tests that execute the patch: 8
Execution time: 2 minutes, 11 seconds
Listing 57: "The generated patch for the bug Closure 121"

Number of tests that execute the patch: 8
Execution time: 2 minutes, 12 seconds

2.49 Closure 124

--- /tmp/closure_124_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_124_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1427,7 +1427,9 @@

if ( diff != null ) {
-  return "Node tree inequality:" +
-    "\nTree1:\n" + toStringTree() +
-    "\nTree2:\n" + node2.toStringTree() +
-    "\nSubtree1: " + diff.nodeA.toStringTree() +
-    "\nSubtree2: " + diff.nodeB.toStringTree();
+  if (node2.type < com.google.javascipt.rhino.Node.SIDE_EFFECT_FLAGS) {
+    return "Node tree inequality:" +
+    "\nTree1:\n" + toStringTree() +
+    "\nTree2:\n" + node2.toStringTree() +
+    "\nSubtree1: " + diff.nodeA.toStringTree() +
+    "\nSubtree2: " + diff.nodeB.toStringTree();
+  }
}

Listing 58: "The generated patch for the bug Closure 124"

Number of tests that execute the patch: 8
Execution time: 17 minutes, 49 seconds

2.50 Closure 126

--- /tmp/closure_126_Nopol/src/com/google/javascipt/jscomp/MinimizeExitPoints.java
+++ /tmp/closure_126_Nopol/src/com/google/javascript/jscomp/MinimizeExitPoints.java
@@ -142,3 +142,5 @@
Node finallyBlock = n.getLastChild();
-  tryMinimizeExits(finallyBlock, exitType, labelName);
+  if (0 == 1) {
+    tryMinimizeExits(finallyBlock, exitType, labelName);
+  }
}

Listing 59: "The generated patch for the bug Closure 126"

Number of tests that execute the patch: 2
Execution time: 2 minutes, 1 second

2.51 Closure 127

--- /tmp/closure_127_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_127_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1427,7 +1427,9 @@

if ( diff != null ) {
-  return "Node tree inequality:" +
-    "\nTree1:\n" + toStringTree() +
-    "\nTree2:\n" + node2.toStringTree() +
-    "\nSubtree1: " + diff.nodeA.toStringTree() +
-    "\nSubtree2: " + diff.nodeB.toStringTree();
+  if (node2.type < com.google.javascipt.rhino.Node.SIDE_EFFECT_FLAGS) {
+    return "Node tree inequality:" +
+    "\nTree1:\n" + toStringTree() +
+    "\nTree2:\n" + node2.toStringTree() +
+    "\nSubtree1: " + diff.nodeA.toStringTree() +
+    "\nSubtree2: " + diff.nodeB.toStringTree();
+  }
}

Listing 60: "The generated patch for the bug Closure 127"

Number of tests that execute the patch: 13
Execution time: 2 minutes, 4 seconds

2.52 Closure 129
Listing 61: "The generated patch for the bug Closure 129"

Number of tests that execute the patch: 8
Execution time: 2 minutes, 18 seconds

2.53 Closure 130

Listing 62: "The generated patch for the bug Closure 130"

Number of tests that execute the patch: 8
Execution time: 2 minutes, 3 seconds

2.54 Closure 131

Listing 63: "The generated patch for the bug Closure 131"

Number of tests that execute the patch: 9
Execution time: 2 minutes, 21 seconds

2.55 Closure 132
if (diff != null) {
    return "Node tree inequality:" +
    "\nTree1:\n" + toStringTree() +
    "\nTree2:\n" + node2.toStringTree() +
    "\nSubtree1: " + diff.nodeA.toStringTree() +
    "\nSubtree2: " + diff.nodeB.toStringTree();
}

Listing 64: "The generated patch for the bug Closure 132"

Number of tests that execute the patch: 8
Execution time: 2 minutes, 25 seconds

2.56 Closure 133

--- /tmp/closure_133_Nopol/src/com/google/javascript/rhino/Node.js
+++ /tmp/closure_133_Nopol/src/com/google/javascript/rhino/Node.js
@@ -1412,4 +1412,3 @@
-  if (token == JsDocToken.EOC || token == JsDocToken.EOL ||
+  if (com.google.javascript.jscomp.parsing.JsDocInfoParser.this.unreadToken != null) {
    return new ExtractionInfo("", token);
}

Listing 65: "The generated patch for the bug Closure 133"

Number of tests that execute the patch: 254
Execution time: 4 minutes, 22 seconds

3 Lang

Nopol repairs 4 bugs in the project Lang.

3.1 Lang 44

--- /tmp/lang_44_Nopol/src/java/org/apache/commons/NumberUtils.java
+++ /tmp/lang_44_Nopol/src/java/org/apache/commons/NumberUtils.java
@@ -192,5 +192,3 @@
  case 'L':
    - if (dec == null
      - && exp == null
-      && (numeric.charAt(0) == '-' && isDigits(numeric.substring(1)) ||
+      && (((dec == null) && (exp == null))) {
        try {
-        return createBigInteger(numeric);
-      }
+        return createBigInteger(numeric);
+    }

Listing 66: "The generated patch for the bug Lang 44"

Number of tests that execute the patch: 3
Execution time: 29 seconds

3.2 Lang 51
Listing 67: "The generated patch for the bug Lang 51"

Number of tests that execute the patch: 1
Execution time: 28 seconds

3.3 Lang 53

Listing 68: "The generated patch for the bug Lang 53"

Number of tests that execute the patch: 6
Execution time: 35 seconds

3.4 Lang 58

Listing 69: "The generated patch for the bug Lang 58"

Number of tests that execute the patch: 3
Execution time: 10 minutes, 26 seconds

4 Math

Nopol repairs 24 bugs in the project Math.

4.1 Math 2

Listing 70: "The generated patch for the bug Math 2"

Number of tests that execute the patch: 63
Execution time: 6 minutes, 18 seconds

4.2 Math 4
Listing 71: "The generated patch for the bug Math 4"

Number of tests that execute the patch: 24
Execution time: 6 minutes, 7 seconds

4.3 Math 7

Listing 72: "The generated patch for the bug Math 7"

Number of tests that execute the patch: 14
Execution time: 20 minutes, 6 seconds

4.4 Math 24

Listing 73: "The generated patch for the bug Math 24"

Number of tests that execute the patch: 2
Execution time: 9 minutes, 53 seconds

4.5 Math 28

Listing 74: "The generated patch for the bug Math 28"

Number of tests that execute the patch: 4
Execution time: 10 minutes, 31 seconds

4.6 Math 33
+ if (org.apache.commons.math3.optimization.linear.SimpexTableau.this.
+ numSlackVariables < org.apache.commons.math3.optimization.linear.SimpexTableau.this.
+ constraints.size()) {
+ 
+ + columnsToDrop.add(i);
+ }
+
+ }
+
+ Listing 75: "The generated patch for the bug Math 33"

Number of tests that execute the patch: 5
Execution time: 9 minutes, 59 seconds

4.7 Math 39

--- /tmp/math_39_Nopol/src/main/java/org/apache/commons/math/ode/nonstiff/
AdaptiveStepsizeIntegrator.java
+++ /tmp/math_39_Nopol/src/main/java/org/apache/commons/math/ode/nonstiff/
AdaptiveStepsizeIntegrator.java
@@ -263 ,3 +263 ,5 @@
ratio = yDot0[j] / scale[j];
- yDotOnScale2 += ratio * ratio ;
+ this.maxStep)) {
+ yDotOnScale2 += ratio * ratio ;
+ }
+
+ Listing 76: "The generated patch for the bug Math 39"

Number of tests that execute the patch: 101
Execution time: 6 minutes, 49 seconds

4.8 Math 40

--- /tmp/math_40_Nopol/src/main/java/org/apache/commons/math/analysis/solvers/
BracketingNthOrderBrentSolver.java
+++ /tmp/math_40_Nopol/src/main/java/org/apache/commons/math/analysis/solvers/
BracketingNthOrderBrentSolver.java
@@ -259 ,3 +259 ,3 @@
// we try again with a lower interpolation order
- if (signChangeIndex - start >= end - signChangeIndex) {
+ if (((signChangeIndex - start) >= (end - signChangeIndex)) || (xA <= org.
+ apache.commons.math.analysis.solversBracketingNthOrderBrentSolver.REDUCTION_FACTOR)) {
+ // we have more points before the sign change, drop the lowest point
+
+ Listing 77: "The generated patch for the bug Math 40"

Number of tests that execute the patch: 19
Execution time: 10 minutes, 33 seconds

4.9 Math 41

--- /tmp/math_41_Nopol/src/main/java/org/apache/commons/math/stat/descriptive/moment/Mean.java
+++ /tmp/math_41_Nopol/src/main/java/org/apache/commons/math/stat/descriptive/moment/Mean.java
@@ -216 ,3 +216 ,5 @@
)
- return xbarw + (correction/sumw);
+ if (xbarw < length) {
+ return xbarw + (correction/sumw);
+ }
+
+ Listing 78: "The generated patch for the bug Math 41"

Number of tests that execute the patch: 6
Execution time: 4 minutes, 31 seconds

4.10 Math 42

--- /tmp/math_42_Nopol/src/main/java/org/apache/commons/math/optimization/linear/SimpexTableau.java
+++ /tmp/math_42_Nopol/src/main/java/org/apache/commons/math/optimization/linear/SimpexTableau.java
@@ -346 ,3 +346 ,5 @@
- if (getBasicRow(col) == null) {
+ if (1 <= org.apache.commons.math.optimization.linear.SimpexTableau.this.
+ numSlackVariables) {
+ columnsToDrop.add(col);
+ 
+ Listing 79: "The generated patch for the bug Math 42"

Number of tests that execute the patch: 13
Execution time: 4 minutes, 53 seconds
Listing 79: "The generated patch for the bug Math 42"

Number of tests that execute the patch: 16
Execution time: 4 minutes, 39 seconds

4.11 Math 44

--- /tmp/math_44_Nopol/src/main/java/org/apache/commons/math/ode/AbstractIntegrator.java
+++ /tmp/math_44_Nopol/src/main/java/org/apache/commons/math/ode/AbstractIntegrator.java
@@ -286,3 +286,5 @@
- statesInitialized = true;
+ if (1 == org.apache.commons.math.ode.AbstractIntegrator.this.stepHandlers.size)
+ statesInitialized = true;
+ }
+ }

Listing 80: "The generated patch for the bug Math 44"

Number of tests that execute the patch: 137
Execution time: 7 minutes, 10 seconds

4.12 Math 49

--- /tmp/math_49_Nopol/src/main/java/org/apache/commons/math/linear/OpenMapRealVector.java
+++ /tmp/math_49_Nopol/src/main/java/org/apache/commons/math/linear/OpenMapRealVector.java
@@ -666,3 +666,5 @@
 } else if (entries.containsKey(index)) {
- entries.remove(index);
+ if (org.apache.commons.math.linear.OpenMapRealVector.DEFAULT_ZERO_TOLERANCE == org.apache.commons.math.linear.OpenMapRealVector.this.epsilon) {
+ entries.remove(index);
+ }
+ }

Listing 81: "The generated patch for the bug Math 49"

Number of tests that execute the patch: 3
Execution time: 3 minutes, 18 seconds

4.13 Math 50

--- /tmp/math_50_Nopol/src/main/java/org/apache/commons/math/analysis/solvers/BaseSecantSolver.java
+++ /tmp/math_50_Nopol/src/main/java/org/apache/commons/math/analysis/solvers/BaseSecantSolver.java
@@ -236,15 +236,17 @@
- if (f0 <= atol)) {
- switch (allowed) {
- case ANY_SIDE:
- return x1;
- case LEFT_SIDE:
- return inverted ? x1 : x0;
- case RIGHT_SIDE:
- return inverted ? x0 : x1;
- case BELOW_SIDE:
- return (f1 <= 0) ? x1 : x0;
- case ABOVE_SIDE:
- return (f1 >= 0) ? x1 : x0;
- default:
- throw new MathInternalError();
+ if (((atol) != (org.apache.commons.math.analysis.solvers.BaseSecantSolver.DEFAULT_ABSOLUTE_ACCURACY)) && (org.apache.commons.math.analysis.solvers.BaseSecantSolver.this.method!=null)) { || (f0 <= atol)) {
+ switch (allowed) {
+ case ANY_SIDE:
+ return x1;
+ case LEFT_SIDE:
+ return inverted ? x1 : x0;
+ case RIGHT_SIDE:
+ return inverted ? x0 : x1;
+ case BELOW_SIDE:
+ return (f1 <= 0) ? x1 : x0;
+ case ABOVE_SIDE:
+ return (f1 >= 0) ? x1 : x0;
+ default:
Listing 82: "The generated patch for the bug Math 50"

Number of tests that execute the patch: 21
Execution time: 8 minutes, 22 seconds

4.14 Math 57

Number of tests that execute the patch: 5
Execution time: 3 minutes, 10 seconds

4.15 Math 58

Number of tests that execute the patch: 10
Execution time: 2 minutes, 54 seconds

4.16 Math 69

Number of tests that execute the patch: 11
Execution time: 33 seconds

4.17 Math 73
if (((!(lower) != (lower))) && (org.apache.commons.math.analysis.solvers.
UnivariateRealSolverImpl.this.result <= org.apache.commons.math.analysis.solvers.
UnivariateRealSolverImpl.this.defaultFunctionValueAccuracy)) || (initial <= lower)) {
    throw MathRuntimeException.createIllegalArgumentException("invalid interval, initial value parameters: lower={0}, initial={1},
    upper={2}");
    "invalid interval, initial value parameters: lower={0}, initial={1}, upper={2}",
    + lower, initial, upper);
}

Listing 86: "The generated patch for the bug Math 73"

Number of tests that execute the patch: 5
Execution time: 34 seconds

4.18 Math 78

--- /tmp/math_78_Nopol/src/main/java/org/apache/commons/math/analysis/solvers/BrentSolver.java
+++ /tmp/math_78_Nopol/src/main/java/org/apache/commons/math/analysis/solvers/BrentSolver.java
@@ -260 ,3 +260 ,3 @@
     // it should NOT be replaced by proximity test
     - if (x0 == x2) {
     + if (((1 < x2) && (!(y0 <= i))) || (x0 == x2)) {
          // Linear interpolation.
Listing 87: "The generated patch for the bug Math 78"

Number of tests that execute the patch: 116
Execution time: 15 minutes, 41 seconds

4.19 Math 80

--- /tmp/math_80_Nopol/src/main/java/org/apache/commons/math/linear/EigenDecompositionImpl.java
+++ /tmp/math_80_Nopol/src/main/java/org/apache/commons/math/linear/EigenDecompositionImpl.java
@@ -1138 ,3 +1138 ,5 @@
    final double tmp = work[i + k];
    - work[i + k] = work[j - k];
    + if (org.apache.commons.math.linear.EigenDecompositionImpl.this.cachedD !=
    + null) {
    +     work[i + k] = work[j - k];
    + } else {
    +     work[j - k] = tmp;
Listing 88: "The generated patch for the bug Math 80"

Number of tests that execute the patch: 1
Execution time: 39 seconds

4.20 Math 81

--- /tmp/math_81_Nopol/src/main/java/org/apache/commons/math/linear/EigenDecompositionImpl.java
+++ /tmp/math_81_Nopol/src/main/java/org/apache/commons/math/linear/EigenDecompositionImpl.java
@@ -1585 ,4 +1585 ,4 @@
         case 1 : // one eigenvalue just deflated. use dMin1, dH1 for dMin and dH.
             - if (dMin1 == dH1 && dMin2 == dH2) {
             + if (org.apache.commons.math.linear.EigenDecompositionImpl.this.main !=null) {
                 // cases 7 and 8.
Listing 89: "The generated patch for the bug Math 81"

Number of tests that execute the patch: 4
Execution time: 40 seconds

4.21 Math 85
if (fa * fb >= 0.0) {
  if (maximumIterations == initial) {
    throw new ConvergenceException(
        "number of iterations={0}, maximum iterations={1}, " +
        "initial={2}, lower bound={3}, upper bound={4}, final a value={5}, " +
        "final b value={6}, f(a)={7}, f(b)={8}" ,
        numIterations, maximumIterations, initial,
        lowerBound, upperBound, a, fa, fb);
  }
}

Listing 90: "The generated patch for the bug Math 85"

Number of tests that execute the patch: 17
Execution time: 37 seconds

4.22 Math 87

--- /tmp/math_87_Nopol/src/java/org/apache/commons/math/optimization/linear/SimplexTableau.java
+++ /tmp/math_87_Nopol/src/java/org/apache/commons/math/optimization/linear/SimplexTableau.java
@@ -160,4 +160,6 @@
  if (! restrictToNonNegative) {
    matrix[row][get SlackVariableOffset () - 1] =
    get InvertedCoefficientSum ( constraint . get Coefficients ());
  }
}

Listing 91: "The generated patch for the bug Math 87"

Number of tests that execute the patch: 12
Execution time: 50 seconds

4.23 Math 88

--- /tmp/math_88_Nopol/src/java/org/apache/commons/math/optimization/linear/SimplexTableau.java
+++ /tmp/math_88_Nopol/src/java/org/apache/commons/math/optimization/linear/SimplexTableau.java
@@ -338,3 +338,5 @@
  if (tableau . getEntry (basicRow , j) == 1) {
    if (org . apache . commons . math . optimization . linear . SimplexTableau . this .
        constraints . size () < org . apache . commons . math . optimization . linear . SimplexTableau . this .
        numDecisionVariables) {
      coefficients[i] = 0;
    }
    }
}

Listing 92: "The generated patch for the bug Math 88"

Number of tests that execute the patch: 3
Execution time: 23 seconds

4.24 Math 105

--- /tmp/math_105_Nopol/src/java/org/apache/commons/math/stat/regression/SimpleRegression.java
+++ /tmp/math_105_Nopol/src/java/org/apache/commons/math/stat/regression/SimpleRegression.java
@@ -107,3 +107,5 @@
    ybar = y;
    if (y <= x) {
      ybar = y;
      }
  }
}

Listing 93: "The generated patch for the bug Math 105"

Number of tests that execute the patch: 9
Execution time: 35 seconds

5 Mockito

Nopol repairs 2 bugs in the project Mockito.
5.1 Mockito 29

```
@@ -28 ,3 +28 ,5 @@
| appendQuoting(description);
| - description.appendText(wanted.toString());
| + if (org.mockito.internal.matchers.Same.this.wanted != null) {
| + description.appendText(wanted.toString());
| -
| appendQuoting(description);
```

Listing 94: "The generated patch for the bug Mockito 29"

Number of tests that execute the patch: 5
Execution time: 18 seconds

5.2 Mockito 38

```
@@ -19 ,3 +19 ,3 @@
| public boolean matches(Object actual) {
| - if (this.wanted == null) {
| + if (!((actual != null) && (actual != null))) {
| + return actual == null;
| }
```

Listing 95: "The generated patch for the bug Mockito 38"

Number of tests that execute the patch: 173
Execution time: 3 minutes, 12 seconds

6 Time

Nopol repairs 8 bugs in the project Time.

6.1 Time 4

```
@@ -458 ,3 +458 ,5 @@
| newTypes[i] = fieldType;
| - newValues[i] = value;
| + if (((20) - (value + newTypes.length) < value) || ((2) != (org.joda.time.Partial.
| + this.iTypes.length))) {
| + newValues[i] = value;
| + }
| System.arraycopy(iTypes, i, newTypes, i + 1, newTypes.length - i - 1);
```

Listing 96: "The generated patch for the bug Time 4"

Number of tests that execute the patch: 75
Execution time: 56 seconds

6.2 Time 7

```
@@ -358,3 +358,5 @@
| saveField(DateTimeFieldType.year(), iDefaultYear);
| - return computeMillis(resetFields, text);
| + if (resetFields) {
| + return computeMillis(resetFields, text);
| + }
```

Listing 97: "The generated patch for the bug Time 7"

Number of tests that execute the patch: 84
Execution time: 43 seconds

6.3 Time 11
if (tailZone != null) {
    if (tailZone.iStartRecurrence.getNameKey().equals(tailZone.iEndRecurrence.getNameKey())) {
        id. length () ==0) {
            System.out.println("Fixing duplicate recurrent name key - " +
            tailZone.iStartRecurrence.getNameKey());
        } else {
            tailZone = new DSTZone(
                tailZone.getID(),
                tailZone.iStandardOffset,
                tailZone.iStartRecurrence.renameAppend(" - Summer"),
                tailZone.iEndRecurrence);
            } else {
            tailZone = new DSTZone(
                tailZone.getID(),
                tailZone.iStandardOffset,
                tailZone.iEndRecurrence.renameAppend(" - Summer");
        }
    else {
        tailZone = new DSTZone(
            tailZone.getZoneInfo().getName(),
            tailZone.iStandardOffset,
            tailZone.iStartRecurrence.renameAppend("-Summer"),
            tailZone.iEndRecurrence);
        } else {
    tailZone = new DSTZone(
            tailZone.getZoneInfo().getName(),
            tailZone.iStandardOffset,
            tailZone.iStartRecurrence.renameAppend("-Summer"),
            tailZone.iEndRecurrence);
        }
    }
} else {
    tailZone = new DSTZone(
        tailZone.getZoneInfo().getName(),
        tailZone.iStandardOffset,
        tailZone.iStartRecurrence.renameAppend("-Summer"),
        tailZone.iEndRecurrence);
    } else {
    tailZone = new DSTZone(
        tailZone.getZoneInfo().getName(),
        tailZone.iStandardOffset,
        tailZone.iStartRecurrence.renameAppend("-Summer"),
        tailZone.iEndRecurrence);
    }}
Listing 98: "The generated patch for the bug Time 11"

Number of tests that execute the patch: 18

Execution time: 53 seconds

6.4 Time 12

Listing 99: "The generated patch for the bug Time 12"

Number of tests that execute the patch: 159

Execution time: 1 minute, 29 seconds

6.5 Time 14

Listing 100: "The generated patch for the bug Time 14"

Number of tests that execute the patch: 63

Execution time: 37 seconds

6.6 Time 16

Listing 101: "The generated patch for the bug Time 16"

Number of tests that execute the patch: 63

Execution time: 37 seconds
6.7 Time 18

Listing 101: "The generated patch for the bug Time 16"

Number of tests that execute the patch: 54
Execution time: 40 seconds

6.7 Time 18

Listing 102: "The generated patch for the bug Time 18"

Number of tests that execute the patch: 3456
Execution time: 7 minutes, 48 seconds

6.8 Time 19

Listing 103: "The generated patch for the bug Time 19"

Number of tests that execute the patch: 2139
Execution time: 3 minutes, 24 seconds

References

