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

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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
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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.

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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},
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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: 47396d2d5c668517bd45be1d1d78074858cb934f
- 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

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

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

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
Listing 5: "The generated patch for the bug Chart 13"
Number of tests that execute the patch: 2
Execution time: 42 seconds

1.6 Chart 17
Listing 6: "The generated patch for the bug Chart 17"
Number of tests that execute the patch: 4
Execution time: 33 seconds

1.7 Chart 21
Listing 7: "The generated patch for the bug Chart 21"
Number of tests that execute the patch: 12
Execution time: 37 seconds

1.8 Chart 25


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
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
### 2.10 Closure 15

```java
3.10 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

```java
--- /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

```java
--- /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

```java
--- /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 <= com.google.javascript.rhino.Node.IS_DISPATCHER) {
+   return "Node tree inequality:") +
+       "\nTree1:\n" + toStringTree() +
+       "\nSubtree1: " + diff.nodeA.toStringTree() +
+       "\nSubtree2: " + diff.nodeB.toStringTree() +
```
Listing 22: "The generated patch for the bug Closure 18"

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

2.14 Closure 20

```java
--- /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

```java
--- /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()) {
             int ancestorType = an.getType();
     -         if (ancestorType == Token.COMMA) continue;
     -         if (ancestorType != Token.EXPR_RESULT && ancestorType != Token.BLOCK) return;
             else break;
     +         if (com.google.javascript.jscomp.CheckSideEffects.PROTECTOR_FN.length() == 0) {
     +             for (Node an : parent.getAncestors()) {
     +                 int ancestorType = an.getType();
     +                 if (ancestorType == Token.COMMA) continue;
     +                 if (ancestorType != Token.EXPR_RESULT && ancestorType != Token.BLOCK) return;
     +                 else break;
     +             }
     + }
     }
```

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

Number of tests that execute the patch: 2
Execution time: 1 minute, 59 seconds

2.16 Closure 22

```java
--- /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.COMMA) continue;
     +     if (com.google.javascript.jscomp.CheckSideEffects.PROTECTOR_FN.length() == 0) {
     +         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;
     +     else
     +         break;
     + }
     }
```

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

2.20 Closure 30
Listing 29: "The generated patch for the bug Closure 30"

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.getCharno());
        }
    }
}

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: " + toStringTree() +
-               "\nTree2: " + node2.toStringTree() +
+               "\nTree2: " + node2.toStringTree() +
                     "\nSubtree1: " + diff.nodeA.toStringTree() +
+               "\nSubtree2: " + diff.nodeB.toStringTree();
+               IS_DISPATCHER) {
+               return "Node tree inequality:" +
+                     "\nTree1: " + toStringTree() +
+                     "\nTree2: " + 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: " + toStringTree() +
-               "\nTree2: " + node2.toStringTree() +
+               "\nTree2: " + node2.toStringTree() +
                     "\nSubtree1: " + diff.nodeA.toStringTree() +
+               "\nSubtree2: " + diff.nodeB.toStringTree();
+           if (com.google.javascript.rhino.Node.this.type < 32) {
+               return "Node tree inequality:" +
+                     "\nTree1: " + toStringTree() +
+                     "\nTree2: " + 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() +
   "\n\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() +
   "\n\nTree2:\n" + node2.toStringTree() +
   "\nSubtree1: " + diff.nodeA.toStringTree() +
   "\nSubtree2: " + diff.nodeB.toStringTree();
+ if (com.google.javaScript.Rhino.Node.this.type < 29) {
+   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() +
   "\n\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
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++) {
        // at the end of the line
        if (excerpt.equals(LINE) && 0 <= charno && charno < sourceExcerpt.length()) {
            for (int i = 0; i < charno; i++) {
                // print the patch
            }
        }
    }
}

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/com/google/javascript/jscomp/LightweightMessageFormatter.java
+++ /tmp/closure_63_Nopol/src/com/google/javascript/jscomp/LightweightMessageFormatter.java
@@ -96,4 +96,3 @@
    if (error != null) {
    for (int i = 0; i < charno; i++) {
        // print the patch
    }

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

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/com/google/javascript/rhino/Node.java
+++ /tmp/closure_67_Nopol/src/com/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();
    }

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/com/google/javascript/rhino/Node.java
+++ /tmp/closure_72_Nopol/src/com/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();
    }

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

--- /tmp/closure_75_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_75_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1410 ,3 +1410 ,5 @@
- res = n.checkTreeEqualsImpl(n2);
  this.first.getType()) {
- res = n.checkTreeEqualsImpl(n2);
+ res = n.checkTreeEqualsImpl(n2);
+ if (node2.type < com.google.javascript.rhino.Node.FUNCTION_PROP) {
+ return "Node tree inequality:" +
+ "\n\nTree1:\n" + toStringTree() +
+ "\n\nTree2:\n" + node2.toStringTree() +
+ "\n\nSubtree1: " + diff.nodeA.toStringTree() +
+ "\n\nSubtree2: " + diff.nodeB.toStringTree();
+ }
+ }
+ if (res != null) {
+}
+
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

--- /tmp/closure_76_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_76_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1368 ,7 +1368 ,9 @@
- return "Node tree inequality:" +
- "\n\nTree1:\n" + toStringTree() +
- "\n\nTree2:\n" + node2.toStringTree() +
- "\n\nSubtree1: " + diff.nodeA.toStringTree() +
- "\n\nSubtree2: " + diff.nodeB.toStringTree();
+ if (node2.type < com.google.javascript.rhino.Node.FUNCTION_PROP) {
+ return "Node tree inequality:" +
+ "\n\nTree1:\n" + toStringTree() +
+ "\n\nTree2:\n" + node2.toStringTree() +
+ "\n\nSubtree1: " + diff.nodeA.toStringTree() +
+ "\n\nSubtree2: " + diff.nodeB.toStringTree();
+ }
+ }
+ if (res != null) {
+}
+
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

--- /tmp/closure_78_Nopol/src/com/google/javascript/jscomp/PeepholeFoldConstants.java
+++ /tmp/closure_78_Nopol/src/com/google/javascript/jscomp/PeepholeFoldConstants.java
@@ -717 ,3 +717 ,5 @@
- if (53 != 0) {
- if (rval == 0) {
- error(DiagnosticType.error("JSC_DIVIDE_BY_0_ERROR", "Divide by 0"), right);
+ if (rval == 0) {
+ error(DiagnosticType.error("JSC_DIVIDE_BY_0_ERROR", "Divide by 0"), right);
+ }
+ return null;
+
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

--- /tmp/closure_111_Nopol/src/com/google/javascript/rhino/testing/Asserts.java
+++ /tmp/closure_111_Nopol/src/com/google/javascript/rhino/testing/Asserts.java
@@ -102 ,3 +102 ,3 @@
- (a == null) == (b == null));
+ (a == null) == (b == null));
- if (a == null) {
-}
-
Listing 50: "The generated patch for the bug 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/google/javascript/jscomp/ProcessClosurePrimitives.java
+++ /tmp/closure_113_Nopol/src/google/javascript/jscomp/ProcessClosurePrimitives.java
@@ -328,3 +328,3 @@
// let them be caught in the subsequent run.
-    if (provided != null) {
+    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/google/javascript/jhono/Node.java
+++ /tmp/closure_114_Nopol/src/google/javascript/jhono/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();
    }
}

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/google/javascript/jhono/Node.java
+++ /tmp/closure_115_Nopol/src/google/javascript/jhono/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();
    }
}

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/google/javascript/jhono/Node.java
+++ /tmp/closure_116_Nopol/src/google/javascript/jhono/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();
    }
}

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

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

2.46 Closure 119

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

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

2.47 Closure 120

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

Number of tests that execute the patch: 8
Execution time: 2 minutes, 11 seconds

2.48 Closure 121
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() +
-       "\n\nTree2:\n" + node2.toStringTree() +
-       "\n\nSubtree1: " + diff.nodeA.toStringTree() +
-       "\n\nSubtree2: " + diff.nodeB.toStringTree();
+       if (node2.type < com.google.javascript.rhino.Node.SIDE_EFFECT_FLAGS) {
+           return "Node tree inequality:" +
+               "\nTree1:\n" + toStringTree() +
+               "\n\nTree2:\n" + node2.toStringTree() +
+               "\n\nSubtree1: " + diff.nodeA.toStringTree() +
+               "\n\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/javascript/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() +
-       "\n\nTree2:\n" + node2.toStringTree() +
-       "\n\nSubtree1: " + diff.nodeA.toStringTree() +
-       "\n\nSubtree2: " + diff.nodeB.toStringTree();
+       if (node2.type < com.google.javascript.rhino.Node.SIDE_EFFECT_FLAGS) {
+           return "Node tree inequality:" +
+               "\nTree1:\n" + toStringTree() +
+               "\n\nTree2:\n" + node2.toStringTree() +
+               "\n\nSubtree1: " + diff.nodeA.toStringTree() +
+               "\n\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

18
if (diff != null) {
  return "Node tree inequality:"
    + "\nTree1:\n" + toStringTree() +
    + "\nTree2:\n" + node2.toStringTree() +
    + "\nSubtree1: " + diff.nodeA.toStringTree() +
    + "\nSubtree2: " + diff.nodeB.toStringTree();
}

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

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.INFERRED_FUNCTION) {
    return "Node tree inequality:"
    + "\nTree1:\n" + toStringTree() +
    + "\nTree2:\n" + node2.toStringTree() +
    + "\nSubtree1: " + diff.nodeA.toStringTree() +
    + "\nSubtree2: " + diff.nodeB.toStringTree();
  }
}

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

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.INFERRED_FUNCTION) {
    return "Node tree inequality:"
    + "\nTree1:\n" + toStringTree() +
    + "\nTree2:\n" + node2.toStringTree() +
    + "\nSubtree1: " + diff.nodeA.toStringTree() +
    + "\nSubtree2: " + diff.nodeB.toStringTree();
  }
}

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"
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.INFERRED_FUNCTION) {
  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/jscomp/parsing/JsDocInfoParser.java
+++ /tmp/closure_133_Nopol/src/com/google/javascript/jscomp/parsing/JsDocInfoParser.java
@@ -1412 ,4 +1412 ,3 @@
- if (token == JsDocToken.EOC || token == JsDocToken.EOL ||
- token == JsDocToken.EOF) {
+ 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)) ||
+     if (((dec == null) && (exp == null))) {
+       try {
@@ -201 ,3 +199 ,3 @@
-       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

--- /tmp/lang_51_Nopol/src/java/org/apache/commons/BooleanUtils.java
+++ /tmp/lang_51_Nopol/src/java/org/apache/commons/BooleanUtils.java
@@ -676 ,6 +676 ,6 @@
  }
- if (ch == 'Y') {
- return
-    (str.charAt(1) == 'E' || str.charAt(1) == 'e') &&
-    (str.charAt(2) == 'S' || str.charAt(2) == 's');
+ if (str!=null) {
+ return
+    (str.charAt(1) == 'E' || str.charAt(1) == 'e') &&

20
Number of tests that execute the patch: 1
Execution time: 28 seconds

### 3.3 Lang 53

```java
--- /tmp/lang_53_Nopol/src/java/org/apache/commons/lang/time/DateUtils.java
+++ /tmp/lang_53_Nopol/src/java/org/apache/commons/lang/time/DateUtils.java
@@ -665,3 +665,5 @@
    date.setTime(time);
    val.setTime(date);
+   if (org.apache.commons.lang.time.DateUtils.RANGE_WEEK_CENTER == millisecs) {
+      val.setTime(date);
+   }
```

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

```java
--- /tmp/lang_58_Nopol/src/java/org/apache/commons/lang/math/NumberUtils.java
+++ /tmp/lang_58_Nopol/src/java/org/apache/commons/lang/math/NumberUtils.java
@@ -451,6 +451,3 @@
    case 'L':
        if (dec == null
            && exp == null
    ```

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

```java
--- /tmp/math_2_Nopol/src/main/java/org/apache/commons/math3/distribution/
    AbstractIntegerDistribution.java
+++ /tmp/math_2_Nopol/src/main/java/org/apache/commons/math3/distribution/
    AbstractIntegerDistribution.java
@@ -137,3 +137,5 @@
    if (tmp < upper) {
        if (tmp == -1) {
            upper = ((int) Math.ceil(tmp)) - 1;
        }
```

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
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

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

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

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
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 @@
-     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();
+     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:
+                 throw new MathInternalError();
+         }
+     }

24
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

Listing 83: "The generated patch for the bug Math 57"
Number of tests that execute the patch: 5
Execution time: 3 minutes, 10 seconds

4.15 Math 58

Listing 84: "The generated patch for the bug Math 58"
Number of tests that execute the patch: 10
Execution time: 2 minutes, 54 seconds

4.16 Math 69

Listing 85: "The generated patch for the bug Math 69"
Number of tests that execute the patch: 11
Execution time: 33 seconds

4.17 Math 73
+ if (((11 <= (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}",
   lower, initial, upper);
   + "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];
   + }
   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 dN.
   - if (dMin1 == dN1 && dMin2 == dN2) {
   + if (org.apache.commons.math.linear.EigenDecompositionImpl.this.main !=null) {
   +   // cases 7 and 8.
   -   if (org.apache.commons.math.linear.EigenDecompositionImpl.this.main!=null) {
   +     // cases 7 and 8.
   -     } else {
   +     } else {
   -       // case 9.
   -
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

--- /tmp/math_85_Nopol/src/java/org/apache/commons/math/analysis/solvers/UnivariateRealSolverUtils.java
+++ /tmp/math_85_Nopol/src/java/org/apache/commons/math/analysis/solvers/UnivariateRealSolverUtils.java
@@ -197,9 +197,9 @@

Listing 89: The generated patch for the bug Math 81

Number of tests that execute the patch: 4
Execution time: 40 seconds
- 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}" ,
- numIteratations, maximumIterations, initial,
- lowerBound, upperBound, a, b, fa, fb);
+ "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}" ,
+ numIteratations, maximumIterations, initial,
+ lowerBound, upperBound, a, b, 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 ) {
+ if ((1) != (constraints.size())) {
                  matrix[row][getSlackVariableOffset () - 1] =
- matrix[row][getSlackVariableOffset () - 1] =
+ getInvertedCoefficientSum (constraint.getCoefficients ());

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 @@
- 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

```java
- 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

```java
- 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

```java
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

```java
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
Number of tests that execute the patch: 18
Execution time: 53 seconds

6.4 Time 12

Number of tests that execute the patch: 159
Execution time: 1 minute, 29 seconds

6.5 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: 54
Execution time: 40 seconds

6.7 Time 18

```
--- /tmp/time_18_Nopol/src/main/java/org/joda/time/chrono/BasicChronology.java
+++ /tmp/time_18_Nopol/src/main/java/org/joda/time/chrono/BasicChronology.java
@@ -604,3 +604,5 @@
     FieldUtils.verifyValueBounds(DateTimeFieldType.monthOfYear(), monthOfYear, 1,
                                  getMaxMonth(year));
-    FieldUtils.verifyValueBounds(DateTimeFieldType.dayOfMonth(), dayOfMonth, 1,
                                  getDaysInYearMonth(year, monthOfYear));
+    if (!((10 == monthOfYear) && ((31) - (2)) != (dayOfMonth))) {
+       FieldUtils.verifyValueBounds(DateTimeFieldType.dayOfMonth(), dayOfMonth, 1,
                                  getDaysInYearMonth(year, monthOfYear));
+    }
     return getYearMonthDayMillis(year, monthOfYear, dayOfMonth);
```

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

```
--- /tmp/time_19_Nopol/src/main/java/org/joda/time/DateTimeZone.java
+++ /tmp/time_19_Nopol/src/main/java/org/joda/time/DateTimeZone.java
@@ -899,3 +899,3 @@

-    } else if (offsetLocal > 0) {
+    } else if (org.joda.time.DateTimeZone.this.iID != null) {
      long prev = previousTransition(instantAdjusted);
```