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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.

We use 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: 47396b4c2d5c668517db45be1d878074858eb934f
• 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) {

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><strong>Total</strong></td>
<td><strong>103</strong></td>
<td><strong>395</strong></td>
<td><strong>26%</strong></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.");
         if (org.jfree.data.time.TimeSeries.this.data.size() == org.jfree.data.time.
             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
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
--- /tmp/chart_26_Nopol/source/org/jfree/chart/plot/CategoryPlot.java
+++ /tmp/chart_26_Nopol/source/org/jfree/chart/plot/CategoryPlot.java
@@ -2537,3 +2537,3 @@
    boolean b2 = (area.getHeight() <= MINIMUM_HEIGHT_TO_DRAW);
-    if (b1 || b2) {
+    if (org.jfree.chart.plot.CategoryPlot.DEFAULT_CROSSHAIR_STROKE != null) {
        return;
    }

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
--- /tmp/closure_1_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_1_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1410,7 +1410,9 @@
    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.this.type)) {
+            return "Node tree inequality:" +
+            "\nTree1:\n" + toStringTree() +
+            "\nTree2:\n" + node2.toStringTree() +
+            "\nSubtree1: " + diff.nodeA.toStringTree() +
+            "\nSubtree2: " + diff.nodeB.toStringTree();
+        }

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
--- /tmp/closure_2_Nopol/src/com/google/javascript/jscomp/TypeCheck.java
+++ /tmp/closure_2_Nopol/src/com/google/javascript/jscomp/TypeCheck.java
@@ -1663,4 +1663,6 @@
    currentProperties.clear();
-    checkInterfaceConflictProperties(t, n, functionPrivateName, properties, currentProperties, interfaceType);
+    if (com.google.javac.jscomp.TypeCheck.this.unknownCount < com.google.javac.jscomp.TypeCheck.this.typedCount) {
+        checkInterfaceConflictProperties(t, n, functionPrivateName, properties, currentProperties, interfaceType);
    } properties.putAll(currentProperties);

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

2.4 Closure 5

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

2.5 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
### 2.10 Closure 15

```java
--- /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() +
                  "\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 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() +
                  "\nTree2:\n" + node2.toStringTree() +
                  "\nSubtree1: " + diff.nodeA.toStringTree() +
                  "\nSubtree2: " + diff.nodeB.toStringTree();
+          if (com.google.javascript.rhino.Node.ISDispatcher) {
+              return "Node tree inequality:" +
+                  "\nTree1:\n" + toStringTree() +
+                  "\nTree2:\n" + node2.toStringTree() +
+                  "\nSubtree1: " + diff.nodeA.toStringTree() +
```

7
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

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

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

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

Number of tests that execute the patch: 3
Execution time: 2 minutes, 24 seconds

2.17 Closure 26

```
--- /tmp/closure_26_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_26_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1429 ,7 +1429 ,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 ((com.google/javascript.rhino.Node.this.type) != (node2.type)) {
         +
         + return "Node tree inequality:"
         + "\nTree1:\n" + node2.toStringTree() + 
         + "\n\nTree2: " + diff.nodeA.toStringTree() + 
         + "\n\nSubtree1: " + diff.nodeA.toStringTree() + 
         + "\n\nSubtree2: " + diff.nodeB.toStringTree();
         +
         + }
```

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

```
--- /tmp/closure_28_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_28_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1429 ,7 +1429 ,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 (com.google/javascript.rhino.Node.this.type < 32) {
         +
         + return "Node tree inequality:"
         + "\nTree1:\n" + toStringTree() + 
         + "\n\nTree2: " + node2.toStringTree() + 
         + "\n\nSubtree1: " + diff.nodeA.toStringTree() + 
         + "\n\nSubtree2: " + diff.nodeB.toStringTree();
         +
         + }
```

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

```
--- /tmp/closure_29_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_29_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1429 ,7 +1429 ,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 ((com.google/javascript.rhino.Node.this.type) != (node2.type)) {
         +
         + return "Node tree inequality:"
         + "\nTree1:\n" + node2.toStringTree() + 
         + "\n\nTree2: " + diff.nodeA.toStringTree() + 
         + "\n\nSubtree1: " + diff.nodeA.toStringTree() + 
         + "\n\nSubtree2: " + diff.nodeB.toStringTree();
         +
         + }
```

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
2.21 Closure 30

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

2.22 Closure 33

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

2.23 Closure 35

Number of tests that execute the patch: 8
Execution time: 1 minute, 52 seconds
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 @@
     - diff.nodeA.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 ((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();
     + }

Listing 35: "The generated patch for the bug Closure 40"
2.27 Closure 45

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

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

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++) {
    // at the end of the line
    if ( excerpt.equals(LINE))
      & & 0 <= charno & & charno < sourceExcerpt.length()) {
    + 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/com/google/javascript/jscomp/LightweightMessageFormatter.java
+++ /tmp/closure_63_Nopol/src/com/google/javascript/jscomp/LightweightMessageFormatter.java
@@ -96,4 +96,3 @@

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 @@

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 @@

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 @@

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

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

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 ( rval == 0 ) { 
+   if (53 == 0) {
+     if ( rval == 0 ) {
- error(DiagnosticType.error("JSC_DIVIDE_BY_0_ERROR", "Divide by 0"), right);
+     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 @@
- if (a == null) { 
+ if (a == null) {
```

Listing 49: "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/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) {
 + 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 (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 54: "The generated patch for the bug Closure 116"
return "Node tree inequality:" +
"\n\nTree1:\n" + toStringTree() +
"\n\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 57: "The generated patch for the bug Closure 121"

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

--- /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.javacript.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

--- /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

--- /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.javacript.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
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 ||
- token == JsDocToken.EOF) {
+ if (com.google.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/lang/NumberUtils.java  
+++ /tmp/lang_44_Nopol/src/java/org/apache/commons/lang/NumberUtils.java  
@@ -192 ,5 +192 ,3 @@
    case 'L':
-        if (dec == null 
-            && exp == null 
-            && (numeric.charAt(0) == '-' && isDigits(numeric.substring(1)) ||
-                isDigits(numeric))) {
+        if (((dec == null) && (exp == null))) {
            try {
                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/lang/BooleanUtils.java  
+++ /tmp/lang_51_Nopol/src/java/org/apache/commons/lang/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
3.3 Lang 53

--- /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

--- /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 @@
                  return createBigInteger(numeric);
    }

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

--- /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) {
    -    upper = ((int) Math.ceil(tmp)) - 1;
    +    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
if ( org.apache.commons.math3.optimization.linear.SimplexTableau.this.
    numSlackVariables < org.apache.commons.math3.optimization.linear.SimplexTableau.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 @@
   
- 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.solvers.BracketingNthOrderBrentSolver.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
   java
   java
@@ -346 ,3 +346 ,5 @@
   if ( getBasicRow ( col ) == null ) {
-        columnsToDrop.add(col);
+        if (1 <= org.apache.commons.math.optimization.linear.SimplexTableau.this.
+            numSlackVariables) {
+            columnsToDrop.add(col);

23
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 @@
   
+            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();
+    }
   
Listing 82: "The generated patch for the bug Math 50"

Number of tests that execute the patch: 18
Execution time: 15 minutes, 30 seconds
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
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

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

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

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][getSlackVariableOffset () - 1] =
    getInvertedCoefficientSum (constraint.getCoefficients());
+  } if ((1) != (constraints.size ())) {
+    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 ((1) != (constraints.size ())) {
    coefficients[i] = 0;
    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;
  } else {
      if (y <= x) {
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

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

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

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

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

saveField(DateTimeFieldType.year(), iDefaultYear);
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

```java
--- /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

```java
--- /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);
```

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

