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

Thomas Durieux, Benjamin Danglot, Zhongxing Yu, Matias Martinez, Simon Urli, Martin Monperrus

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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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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: 473964c2d5c668517bd45be1d878074858cb934f

- 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>

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
+ } }
- } else if (orientation == PlotOrientation.VERTICAL) {
-      drawVerticalItem(g2, state, dataArea, plot, domainAxis, rangeAxis,
-                      statData, row, column);
- }
}

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.javascript.jscomp.TypeCheck.this.unknownCount < com.google.javascript.jscomp.TypeCheck.this.typedCount) {
+            checkInterfaceConflictProperties(t, n, functionPrivateName, properties, currentProperties, interfaceType);
+        }
    }

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

4
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
2.10 Closure 15

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

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

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

2.14 Closure 20

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

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

2.15 Closure 21

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

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

2.16 Closure 22

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

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
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.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

```java
--- /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();
+      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

```java
--- /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

```java
--- /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.js出众.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:" +
         "\n Tree1:\n" + toStringTree() +
-       "\n Tree2:\n" + node2.toStringTree() +
-       "\n Subtree1: " + diff.nodeA.toStringTree() +
-       "\n Subtree2: " + diff.nodeB.toStringTree();
+       if (com.google.javascript.rhino.Node.this.type < 32) {
+         return "Node tree inequality:" +
+         "\n Tree1:\n" + toStringTree() +
+         "\n Tree2:\n" + node2.toStringTree() +
+         "\n Subtree1: " + diff.nodeA.toStringTree() +
+         "\n Subtree2: " + 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:" +
         "\n Tree1:\n" + toStringTree() +
-       "\n Tree2:\n" + node2.toStringTree() +
-       "\n Subtree1: " + diff.nodeA.toStringTree() +
-       "\n Subtree2: " + diff.nodeB.toStringTree();
+       if (com.google.javascript.rhino.Node.this.type < 29) {
+         return "Node tree inequality:" +
+         "\n Tree1:\n" + toStringTree() +
+         "\n Tree2:\n" + node2.toStringTree() +
+         "\n Subtree1: " + diff.nodeA.toStringTree() +
+         "\n Subtree2: " + 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:" +
         "\n Tree1:\n" + toStringTree() +
-       "\n Tree2:\n" + node2.toStringTree() +
-       "\n Subtree1: " + diff.nodeA.toStringTree() +
-       "\n Subtree2: " + diff.nodeB.toStringTree();
+       if (com.google.javascript.rhino.Node.this.type <= com.google.javascript.rhino.Node.LABEL_PROP) {
+         return "Node tree inequality:" +
+         "\n Tree1:\n" + toStringTree() +
+         "\n Tree2:\n" + node2.toStringTree() +
+         "\n Subtree1: " + diff.nodeA.toStringTree() +
+         "\n Subtree2: " + 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
// reductions if doing so will result in some savings.
- if (savings > (helperCodeCost + SAVINGS_THRESHOLD)) {
-   for (Reduction reduction : reductions) {
-     reduction.apply();
-   }
- } else {
-   if ((1) != (reductions.size())) && (!(reducers.size() < reductions.size())) {
-     if (savings > (helperCodeCost + SAVINGS_THRESHOLD)) {
-       for (Reduction reduction : reductions) {
-         reduction.apply();
-       }
-     }
-   }
-   Node addingRoot = compiler.getNodeForCodeInsertion(null);
-   addingRoot.addChildrenToFront(helperCode);
-   compiler.reportCodeChange();
- }
- Node addingRoot = compiler.getNodeForCodeInsertion(null);
- addingRoot.addChildrenToFront(helperCode);
- compiler.reportCodeChange();
}

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

--- /tmp/closure_60_Nopol/src/com/google/javascript/jscomp/PeepholeSubstituteAlternateSyntax.java
++ /tmp/closure_60_Nopol/src/com/google/javascript/jscomp/PeepholeSubstituteAlternateSyntax.java
@@ -1196,3 +1196,5 @@
  if (!newNode.isEquivalentTo(n)) {
    parent.replaceChild(n, newNode);
  } else if (com.google.javascript.jscomp.PeepholeSubstituteAlternateSyntax.this.late) {
+    parent.replaceChild(n, newNode);
+  }
+  reportCodeChange();
}

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

--- /tmp/closure_61_Nopol/src/com/google/javascript/rhino/Node.java
+++ /tmp/closure_61_Nopol/src/com/google/javascript/rhino/Node.java
@@ -1460,7 +1460,9 @@
  if (diff != null) {
    return "Node tree inequality:" +
    "\n\nTree1: " + toStringTree() +
+    "\n\nSubtree2: " + diff.nodeB.toStringTree();
+  } else if ((com.google.javascript.rhino.Node.this.type) != (node2.type)) {
+    return "Node tree inequality:" +
+    "\n\nTree1: " + toStringTree() +
+    "\n\nSubtree2: " + diff.nodeA.toStringTree() +
+    "\n\nSubtree2: " + diff.nodeB.toStringTree();
  }
}

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

--- /tmp/closure_62_Nopol/src/com/google/javascript/jscomp/LightweightMessageFormatter.java
+++ /tmp/closure_62_Nopol/src/com/google/javascript/jscomp/LightweightMessageFormatter.java
@@ -96,4 +96,3 @@
  // 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

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

2.35 Closure 66

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

2.36 Closure 67

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

2.37 Closure 72
Number of tests that execute the patch: 2
Execution time: 1 minute, 32 seconds

2.38 Closure 75

Number of tests that execute the patch: 3164
Execution time: 24 minutes, 1 second

2.39 Closure 76

Number of tests that execute the patch: 5
Execution time: 1 minute, 30 seconds

2.40 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) {
+     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() +  
-     "\nSubtree1: " + diff.nodeA.toStringTree() + 
+     "\nSubtree1: " + diff.nodeA.toStringTree() + 
     if (node2.type < com.google.javascript.rhino.Node.JSDOC_INFO_PROP) {
+     return "Node tree inequality:" +
         "\nTree1:\n" + toStringTree() +  
-     "\nSubtree1: " + diff.nodeA.toStringTree() + 
+     "\nSubtree1: " + diff.nodeA.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() +  
-     "\nSubtree1: " + diff.nodeA.toStringTree() + 
+     "\nSubtree1: " + diff.nodeA.toStringTree() + 
     if (node2.type < com.google.javascript.rhino.Node.JSDOC_INFO_PROP) {
+     return "Node tree inequality:" +
         "\nTree1:\n" + toStringTree() +  
-     "\nSubtree1: " + diff.nodeA.toStringTree() + 
+     "\nSubtree1: " + diff.nodeA.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() +  
-     "\nSubtree1: " + diff.nodeA.toStringTree() + 
+     "\nSubtree1: " + diff.nodeA.toStringTree() + 
     if (node2.type < com.google.javascript.rhino.Node.JSDOC_INFO_PROP) {
+     return "Node tree inequality:" +
         "\nTree1:\n" + toStringTree() +  
-     "\nSubtree1: " + diff.nodeA.toStringTree() + 
+     "\nSubtree1: " + diff.nodeA.toStringTree() + 
     }
     }

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

Number of tests that execute the patch: 14
Execution time: 2 minutes, 18 seconds
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() +
-         "\nTree2: \n" + node2.toStringTree() +
-         "\nSubtree1: " + diff.nodeA.toStringTree() +
-         "\nSubtree2: " + diff.nodeB.toStringTree();
+       if ( node2.type < com.google.javascrip\n\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/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() +
-         "\nTree2: \n" + node2.toStringTree() +
-         "\nSubtree1: " + diff.nodeA.toStringTree() +
-         "\nSubtree2: " + diff.nodeB.toStringTree();
+       if ( node2.type < com.google.javascrip\n\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
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();
}  
}

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();
}  
}

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:
" + toStringTree() + "\nTree2:
" + 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) {
-    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)) ||
-          isDigits(numeric))) {
+      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
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
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
Number of tests that execute the patch: 16
Execution time: 4 minutes, 39 seconds

4.11 Math 44

Listing 79: "The generated patch for the bug Math 42"

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

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
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 (((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 == dH1 && dMin2 == dH2) {
    + if (org.apache.commons.math.linear.EigenDecompositionImpl.this.main !=null) {
    +   // cases 7 and 8.
   @@ -1618 ,3 +1618 ,3 @@
    } 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 @@
    List 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 == dH1 && dMin2 == dH2) {
    + if (org.apache.commons.math.linear.EigenDecompositionImpl.this.main !=null) {
    +   // cases 7 and 8.
   @@ -1618 ,3 +1618 ,3 @@
    } 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 @@
    List 86: "The generated patch for the bug Math 73"
    Number of tests that execute the patch: 5
    Execution time: 34 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}" ,
            numIterations , maximumIterations , initial ,
            lowerBound , upperBound , a , 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}" ,
    +
    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] =
        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 (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/linear/SimpleRegression.java
+++ /tmp/math_105_Nopol/src/java/org/apache/commons/math/stat/linear/SimpleRegression.java
@@ -107,3 +107,5 @@
    xbar = x;
    ybar = y;
    if (y <= x) {
    +
    ybar = y;
    +
    }
} else {

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.

27
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
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
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

