

# DataUtilities.java

```
1  /* =====
2   * JFreeChart : a free chart library for the Java(tm) platform
3   * =====
4   *
5   * (C) Copyright 2000-2013, by Object Refinery Limited and Contributors.
6   *
7   * Project Info:  http://www.jfree.org/jfreechart/index.html
8   *
9   * This library is free software; you can redistribute it and/or modify it
10  * under the terms of the GNU Lesser General Public License as published by
11  * the Free Software Foundation; either version 2.1 of the License, or
12  * (at your option) any later version.
13  *
14  * This library is distributed in the hope that it will be useful, but
15  * WITHOUT ANY WARRANTY; without even the implied warranty of MERCHANTABILITY
16  * or FITNESS FOR A PARTICULAR PURPOSE. See the GNU Lesser General Public
17  * License for more details.
18  *
19  * You should have received a copy of the GNU Lesser General Public
20  * License along with this library; if not, write to the Free Software
21  * Foundation, Inc., 51 Franklin Street, Fifth Floor, Boston, MA 02110-1301,
22  * USA.
23  *
24  * [Oracle and Java are registered trademarks of Oracle and/or its affiliates.
25  * Other names may be trademarks of their respective owners.]
26  *
27  * -----
28  * DataUtilities.java
29  * -----
30  * (C) Copyright 2003-2013, by Object Refinery Limited and contributors.
31  *
32  * Original Author:  David Gilbert (for Object Refinery Limited);
33  * Contributor(s):   Peter Kolb (patch 2511330);
34  *
35  * Changes
36  * -----
37  * 05-Mar-2003 : Version 1 (DG);
38  * 03-Mar-2005 : Moved createNumberArray() and createNumberArray2D() methods
39  *               from the DatasetUtilities class (DG);
40  * 17-May-2005 : Added calculateColumnTotal() and calculateRowTotal()
41  *               methods (DG);
42  * 28-Jan-2009 : Added equal(double[][], double[][]) method (DG);
43  * 28-Jan-2009 : Added clone(double[][]) method (DG);
44  * 04-Feb-2009 : Added calculateColumnTotal/RowTotal variants (PK);
45  * 03-Jul-2013 : Use ParamChecks (DG);
46  *
47  */
48
49 package org.jfree.data;
50
51 import java.util.Arrays;
52 import org.jfree.chart.util.ParamChecks;
53 import org.jfree.data.general.DatasetUtilities;
54
55 /**
56  * Utility methods for use with some of the data classes (but not the datasets,
57  * see {@link DatasetUtilities}).
58  */
59 public abstract class DataUtilities {
60
61     /**
62      * Tests two arrays for equality. To be considered equal, the arrays must
63      * have exactly the same dimensions, and the values in each array must also
64      * match (two values that are both NaN or both INF are considered equal
65      * in this test).
66      *
67      * @param a the first array (<code>>null</code> permitted).
68      * @param b the second array (<code>>null</code> permitted).
```

```

69      *
70      * @return A boolean.
71      *
72      * @since 1.0.13
73      */
74      public static boolean equal(double[][] a, double[][] b) {
75          4      if (a == null) {
76              19          return (b == null);
77      }
78          4      if (b == null) {
79              7          return false; // already know 'a' isn't null
80      }
81          8      if (a.length != b.length) {
82              7          return false;
83      }
84          19      for (int i = 0; i < a.length; i++) {
85              19          if (!Arrays.equals(a[i], b[i])) {
86                  7              return false;
87          }
88      }
89          8      return true;
90  }
91
92  /**
93   * Returns a clone of the specified array.
94   *
95   * @param source the source array (<code>null</code> not permitted).
96   *
97   * @return A clone of the array.
98   *
99   * @since 1.0.13
100  */
101  public static double[][] clone(double[][] source) {
102      1      ParamChecks.nullNotPermitted(source, "source");
103      double[][] clone = new double[source.length][];
104      19      for (int i = 0; i < source.length; i++) {
105          9          if (source[i] != null) {
106              5              double[] row = new double[source[i].length];
107              21              System.arraycopy(source[i], 0, row, 0, source[i].length);
108              5              clone[i] = row;
109          }
110      }
111      2      return clone;
112  }
113
114  /**
115   * Returns the total of the values in one column of the supplied data
116   * table.
117   *
118   * @param data the table of values (<code>null</code> not permitted).
119   * @param column the column index (zero-based).
120   *
121   * @return The total of the values in the specified column.
122   */
123  public static double calculateColumnTotal(Values2D data, int column) {
124      1      ParamChecks.nullNotPermitted(data, "data");
125      5      double total = 0.0;
126      1      int rowCount = data.getRowCount();
127      25      for (int r = 0; r < rowCount; r++) {
128          11          Number n = data.getValue(r, column);
129          4          if (n != null) {
130              13              total += n.doubleValue();
131          }
132      }
133      7      return total;
134  }
135
136  /**
137   * Returns the total of the values in one column of the supplied data
138   * table by taking only the row numbers in the array into account.
139   *
140   * @param data the table of values (<code>null</code> not permitted).

```

```

141     * @param column the column index (zero-based).
142     * @param validRows the array with valid rows (zero-based).
143     *
144     * @return The total of the valid values in the specified column.
145     *
146     * @since 1.0.13
147     */
148     public static double calculateColumnTotal(Values2D data, int column,
149         int[] validRows) {
150         ParamChecks.nullNotPermitted(data, "data");
151         double total = 0.0;
152         int rowCount = data.getRowCount();
153         for (int v = 0; v < validRows.length; v++) {
154             int row = validRows[v];
155             if (row < rowCount) {
156                 Number n = data.getValue(row, column);
157                 if (n != null) {
158                     total += n.doubleValue();
159                 }
160             }
161         }
162         return total;
163     }
164
165     /**
166     * Returns the total of the values in one row of the supplied data
167     * table.
168     *
169     * @param data the table of values (<code>>null</code> not permitted).
170     * @param row the row index (zero-based).
171     *
172     * @return The total of the values in the specified row.
173     */
174     public static double calculateRowTotal(Values2D data, int row) {
175         ParamChecks.nullNotPermitted(data, "data");
176         double total = 0.0;
177         int columnCount = data.getColumnCount();
178         for (int c = 0; c < columnCount; c++) {
179             Number n = data.getValue(row, c);
180             if (n != null) {
181                 total += n.doubleValue();
182             }
183         }
184         return total;
185     }
186
187     /**
188     * Returns the total of the values in one row of the supplied data
189     * table by taking only the column numbers in the array into account.
190     *
191     * @param data the table of values (<code>>null</code> not permitted).
192     * @param row the row index (zero-based).
193     * @param validCols the array with valid cols (zero-based).
194     *
195     * @return The total of the valid values in the specified row.
196     *
197     * @since 1.0.13
198     */
199     public static double calculateRowTotal(Values2D data, int row,
200         int[] validCols) {
201         ParamChecks.nullNotPermitted(data, "data");
202         double total = 0.0;
203         int colCount = data.getColumnCount();
204         for (int v = 0; v < validCols.length; v++) {
205             int col = validCols[v];
206             if (col < colCount) {
207                 Number n = data.getValue(row, col);
208                 if (n != null) {
209                     total += n.doubleValue();
210                 }
211             }
212         }

```

```

213 7         return total;
214     }
215
216     /**
217     * Constructs an array of Number objects from an array of
218     * double primitives.
219     *
220     * @param data the data (null not permitted).
221     *
222     * @return An array of Double.
223     */
224     public static Number[] createNumberArray(double[] data) {
225 1         ParamChecks.nullNotPermitted(data, "data");
226         Number[] result = new Number[data.length];
227 19         for (int i = 0; i < data.length; i++) {
228 16             result[i] = new Double(data[i]);
229         }
230 2         return result;
231     }
232
233     /**
234     * Constructs an array of arrays of Number objects from a
235     * corresponding structure containing double primitives.
236     *
237     * @param data the data (null not permitted).
238     *
239     * @return An array of Double.
240     */
241     public static Number[][] createNumberArray2D(double[][] data) {
242 1         ParamChecks.nullNotPermitted(data, "data");
243         int l1 = data.length;
244 5         Number[][] result = new Number[l1][];
245 25         for (int i = 0; i < l1; i++) {
246 11             result[i] = createNumberArray(data[i]);
247         }
248 2         return result;
249     }
250
251     /**
252     * Returns a {@link KeyedValues} instance that contains the cumulative
253     * percentage values for the data in another {@link KeyedValues} instance.
254     * <p>
255     * The percentages are values between 0.0 and 1.0 (where 1.0 = 100%).
256     *
257     * @param data the data (null not permitted).
258     *
259     * @return The cumulative percentages.
260     */
261     public static KeyedValues getCumulativePercentages(KeyedValues data) {
262 1         ParamChecks.nullNotPermitted(data, "data");
263 1         DefaultKeyedValues result = new DefaultKeyedValues();
264 5         double total = 0.0;
265 20         for (int i = 0; i < data.getItemCount(); i++) {
266 6             Number v = data.getValue(i);
267 4             if (v != null) {
268 15                 total = total + Math.abs(v.doubleValue());
269             }
270         }
271 5         double runningTotal = 0.0;
272 20         for (int i = 0; i < data.getItemCount(); i++) {
273 6             Number v = data.getValue(i);
274 4             if (v != null) {
275 15                 runningTotal = runningTotal + Math.abs(v.doubleValue());
276             }
277 25             result.addValue(data.getKey(i), new Double(runningTotal / total));
278         }
279 2         return result;
280     }
281
282 }

```

## Mutations

75

1. negated conditional → KILLED
2. removed conditional - replaced equality check with false → KILLED
3. removed conditional - replaced equality check with true → KILLED
4. not equal to equal → KILLED
1. replaced boolean return with false for org/jfree/data/DataUtilities::equal → KILLED
2. replaced boolean return with true for org/jfree/data/DataUtilities::equal → KILLED
3. Substituted 1 with 0 → KILLED
4. Substituted 0 with 1 → KILLED
5. negated conditional → KILLED
6. removed conditional - replaced equality check with false → KILLED
7. removed conditional - replaced equality check with true → KILLED
8. replaced return of integer sized value with (x == 0 ? 1 : 0) → KILLED
9. replaced return of integer sized value with (x == 0 ? 1 : 0) → KILLED

76

10. Substituted 0 with 1 → KILLED
11. Substituted 1 with 0 → KILLED
12. Substituted 1 with -1 → SURVIVED
13. Substituted 0 with -1 → KILLED
14. Substituted 1 with -1 → SURVIVED
15. Substituted 1 with 2 → KILLED
16. Substituted 0 with 1 → KILLED
17. Substituted 1 with 0 → KILLED
18. Substituted 0 with -1 → KILLED
19. not equal to equal → KILLED

78

1. negated conditional → KILLED
2. removed conditional - replaced equality check with false → KILLED
3. removed conditional - replaced equality check with true → KILLED
4. not equal to equal → KILLED
1. replaced boolean return with true for org/jfree/data/DataUtilities::equal → KILLED
2. Substituted 0 with 1 → KILLED
3. replaced return of integer sized value with (x == 0 ? 1 : 0) → KILLED

79

4. Substituted 0 with 1 → KILLED
5. Substituted 0 with -1 → KILLED
6. Substituted 0 with 1 → KILLED
7. Substituted 0 with -1 → KILLED
1. negated conditional → KILLED
2. removed conditional - replaced equality check with false → KILLED
3. removed conditional - replaced equality check with true → KILLED

81

4. equal to less than → KILLED
5. equal to less or equal → KILLED
6. equal to greater than → KILLED
7. equal to greater or equal → KILLED
8. equal to not equal → KILLED
1. replaced boolean return with true for org/jfree/data/DataUtilities::equal → KILLED
2. Substituted 0 with 1 → KILLED
3. replaced return of integer sized value with (x == 0 ? 1 : 0) → KILLED

82

4. Substituted 0 with 1 → KILLED
5. Substituted 0 with -1 → KILLED
6. Substituted 0 with 1 → KILLED
7. Substituted 0 with -1 → KILLED
1. changed conditional boundary → KILLED
2. Substituted 0 with 1 → KILLED
3. negated conditional → KILLED
4. removed conditional - replaced comparison check with false → KILLED
5. removed conditional - replaced comparison check with true → KILLED
6. Negated integer local variable number 2 → KILLED
7. Substituted 0 with 1 → KILLED
8. Substituted 0 with -1 → KILLED
9. Substituted 0 with 1 → KILLED

84

10. Substituted 0 with -1 → KILLED
11. Less than to less or equal → KILLED
12. Less than to greater than → KILLED
13. Less than to greater or equal → KILLED
14. Less than to equal → KILLED
15. Less than to not equal → SURVIVED
16. Incremented (a++) integer local variable number 2 → KILLED
17. Decrement (a--) integer local variable number 2 → KILLED
18. Incremented (++a) integer local variable number 2 → KILLED
19. Decrement (--a) integer local variable number 2 → KILLED
1. negated conditional → KILLED
2. removed call to java/util/Arrays::equals → KILLED
3. removed conditional - replaced equality check with false → KILLED
4. removed conditional - replaced equality check with true → KILLED
5. Negated integer local variable number 2 → KILLED
6. Negated integer local variable number 2 → KILLED
7. not equal to less than → KILLED
8. not equal to less or equal → KILLED
9. not equal to greater than → SURVIVED

85

10. not equal to greater or equal → KILLED
11. not equal to equal → KILLED
12. Incremented (a++) integer local variable number 2 → KILLED
13. Incremented (a++) integer local variable number 2 → KILLED
14. Decrement (a--) integer local variable number 2 → KILLED
15. Decrement (a--) integer local variable number 2 → TIMED\_OUT
16. Incremented (++a) integer local variable number 2 → KILLED
17. Incremented (++a) integer local variable number 2 → KILLED
18. Decrement (--a) integer local variable number 2 → KILLED
19. Decrement (--a) integer local variable number 2 → KILLED

86 1. replaced boolean return with true for org/jfree/data/DataUtilities::equal → KILLED  
2. Substituted 0 with 1 → KILLED  
3. replaced return of integer sized value with (x == 0 ? 1 : 0) → KILLED  
4. Substituted 0 with 1 → KILLED  
5. Substituted 0 with -1 → KILLED  
6. Substituted 0 with 1 → KILLED  
7. Substituted 0 with -1 → KILLED  
1. replaced boolean return with false for org/jfree/data/DataUtilities::equal → KILLED  
2. Substituted 1 with 0 → KILLED  
3. replaced return of integer sized value with (x == 0 ? 1 : 0) → KILLED

89 4. Substituted 1 with 0 → KILLED  
5. Substituted 1 with -1 → SURVIVED  
6. Substituted 1 with -1 → SURVIVED  
7. Substituted 1 with 2 → KILLED  
8. Substituted 1 with 0 → KILLED

102 1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted → KILLED  
1. changed conditional boundary → KILLED  
2. Substituted 0 with 1 → KILLED  
3. negated conditional → KILLED  
4. removed conditional - replaced comparison check with false → KILLED  
5. removed conditional - replaced comparison check with true → KILLED  
6. Negated integer local variable number 2 → KILLED  
7. Substituted 0 with 1 → KILLED  
8. Substituted 0 with -1 → KILLED  
9. Substituted 0 with 1 → KILLED

104 10. Substituted 0 with -1 → KILLED  
11. Less than to less or equal → KILLED  
12. Less than to greater than → KILLED  
13. Less than to greater or equal → KILLED  
14. Less than to equal → KILLED  
15. Less than to not equal → SURVIVED  
16. Incremented (a++) integer local variable number 2 → KILLED  
17. Decrementd (a--) integer local variable number 2 → KILLED  
18. Incremented (++a) integer local variable number 2 → KILLED  
19. Decrementd (--a) integer local variable number 2 → KILLED  
1. negated conditional → KILLED  
2. removed conditional - replaced equality check with false → KILLED  
3. removed conditional - replaced equality check with true → SURVIVED  
4. Negated integer local variable number 2 → KILLED

105 5. equal to not equal → KILLED  
6. Incremented (a++) integer local variable number 2 → KILLED  
7. Decrementd (a--) integer local variable number 2 → KILLED  
8. Incremented (++a) integer local variable number 2 → KILLED  
9. Decrementd (--a) integer local variable number 2 → KILLED  
1. Negated integer local variable number 2 → KILLED  
2. Incremented (a++) integer local variable number 2 → KILLED

106 3. Decrementd (a--) integer local variable number 2 → KILLED  
4. Incremented (++a) integer local variable number 2 → KILLED  
5. Decrementd (--a) integer local variable number 2 → KILLED  
1. Substituted 0 with 1 → KILLED  
2. Substituted 0 with 1 → KILLED  
3. removed call to java/lang/System::arraycopy → KILLED  
4. Negated integer local variable number 2 → KILLED  
5. Negated integer local variable number 2 → KILLED  
6. Substituted 0 with 1 → KILLED  
7. Substituted 0 with 1 → KILLED  
8. Substituted 0 with -1 → KILLED  
9. Substituted 0 with -1 → KILLED  
10. Substituted 0 with 1 → KILLED

107 11. Substituted 0 with 1 → KILLED  
12. Substituted 0 with -1 → KILLED  
13. Substituted 0 with -1 → KILLED  
14. Incremented (a++) integer local variable number 2 → KILLED  
15. Incremented (a++) integer local variable number 2 → KILLED  
16. Decrementd (a--) integer local variable number 2 → KILLED  
17. Decrementd (a--) integer local variable number 2 → KILLED  
18. Incremented (++a) integer local variable number 2 → KILLED  
19. Incremented (++a) integer local variable number 2 → KILLED  
20. Decrementd (--a) integer local variable number 2 → KILLED  
21. Decrementd (--a) integer local variable number 2 → KILLED  
1. Negated integer local variable number 2 → KILLED  
2. Incremented (a++) integer local variable number 2 → KILLED

108 3. Decrementd (a--) integer local variable number 2 → TIMED\_OUT  
4. Incremented (++a) integer local variable number 2 → KILLED  
5. Decrementd (--a) integer local variable number 2 → KILLED  
1. replaced return value with null for org/jfree/data/DataUtilities::clone → KILLED

111 2. mutated return of Object value for org/jfree/data/DataUtilities::clone to ( if (x != null) null else throw new RuntimeException ) → KILLED

124 1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted → KILLED  
1. Substituted 0.0 with 1.0 → KILLED  
2. Substituted 0.0 with 1.0 → KILLED

125 3. Substituted 0.0 with -1.0 → KILLED  
4. Substituted 0.0 with 1.0 → KILLED  
5. Substituted 0.0 with -1.0 → KILLED

126 1. removed call to org/jfree/data/Values2D::getRowCount → KILLED

127 1. changed conditional boundary → KILLED  
2. Changed increment from 1 to -1 → KILLED

3. Substituted 0 with 1 → KILLED  
 4. negated conditional → KILLED  
 5. removed conditional - replaced comparison check with false → KILLED  
 6. removed conditional - replaced comparison check with true → KILLED  
 7. Negated integer local variable number 5 → KILLED  
 8. Negated integer local variable number 4 → KILLED  
 9. Substituted 0 with 1 → KILLED  
 10. Substituted 0 with -1 → KILLED  
 11. Substituted 0 with 1 → KILLED  
 12. Substituted 0 with -1 → KILLED  
 13. Less than to less or equal → KILLED  
 14. Less than to greater than → KILLED  
 15. Less than to greater or equal → KILLED  
 16. Less than to equal → KILLED  
 17. Less than to not equal → SURVIVED  
 18. Incremented (a++) integer local variable number 5 → KILLED  
 19. Incremented (a++) integer local variable number 4 → KILLED  
 20. Decrementd (a--) integer local variable number 5 → KILLED  
 21. Decrementd (a--) integer local variable number 4 → KILLED  
 22. Incremented (a++) integer local variable number 5 → KILLED  
 23. Incremented (a++) integer local variable number 4 → KILLED  
 24. Decrementd (--a) integer local variable number 5 → KILLED  
 25. Decrementd (--a) integer local variable number 4 → KILLED  
 1. removed call to org/jfree/data/Values2D::getValue → KILLED  
 2. Negated integer local variable number 5 → KILLED  
 3. Negated integer local variable number 1 → KILLED  
 4. Incremented (a++) integer local variable number 5 → KILLED  
 5. Incremented (a++) integer local variable number 1 → KILLED  
 128 6. Decrementd (a--) integer local variable number 5 → KILLED  
 7. Decrementd (a--) integer local variable number 1 → KILLED  
 8. Incremented (a++) integer local variable number 5 → KILLED  
 9. Incremented (a++) integer local variable number 1 → KILLED  
 10. Decrementd (--a) integer local variable number 5 → KILLED  
 11. Decrementd (--a) integer local variable number 1 → KILLED  
 1. negated conditional → KILLED  
 2. removed conditional - replaced equality check with false → KILLED  
 129 3. removed conditional - replaced equality check with true → KILLED  
 4. equal to not equal → KILLED  
 1. Replaced double addition with subtraction → KILLED  
 2. removed call to java/lang/Number::doubleValue → KILLED  
 3. Negated double local variable number 2 → KILLED  
 4. Replaced double operation with first member → KILLED  
 5. Replaced double operation by second member → KILLED  
 6. Replaced double addition with subtraction → KILLED  
 130 7. Replaced double addition with multiplication → KILLED  
 8. Replaced double addition with division → KILLED  
 9. Replaced double addition with modulus → KILLED  
 10. Incremented (a++) double local variable number 2 → SURVIVED  
 11. Decrementd (a--) double local variable number 2 → SURVIVED  
 12. Incremented (a++) double local variable number 2 → KILLED  
 13. Decrementd (--a) double local variable number 2 → KILLED  
 1. replaced double return with 0.0d for org/jfree/data/DataUtilities::calculateColumnTotal → KILLED  
 2. replaced return of double value with -(x + 1) for org/jfree/data/DataUtilities::calculateColumnTotal → KILLED  
 3. Negated double local variable number 2 → KILLED  
 133 4. Incremented (a++) double local variable number 2 → SURVIVED  
 5. Decrementd (a--) double local variable number 2 → SURVIVED  
 6. Incremented (a++) double local variable number 2 → KILLED  
 7. Decrementd (--a) double local variable number 2 → KILLED  
 150 1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted → KILLED  
 1. Substituted 0.0 with 1.0 → KILLED  
 2. Substituted 0.0 with 1.0 → KILLED  
 151 3. Substituted 0.0 with -1.0 → KILLED  
 4. Substituted 0.0 with 1.0 → KILLED  
 5. Substituted 0.0 with -1.0 → KILLED  
 152 1. removed call to org/jfree/data/Values2D::getRowCount → KILLED  
 1. changed conditional boundary → KILLED  
 2. Changed increment from 1 to -1 → KILLED  
 3. Substituted 0 with 1 → KILLED  
 4. negated conditional → KILLED  
 5. removed conditional - replaced comparison check with false → KILLED  
 6. removed conditional - replaced comparison check with true → KILLED  
 7. Negated integer local variable number 6 → KILLED  
 8. Substituted 0 with 1 → KILLED  
 9. Substituted 0 with -1 → KILLED  
 10. Substituted 0 with 1 → KILLED  
 153 11. Substituted 0 with -1 → KILLED  
 12. Less than to less or equal → KILLED  
 13. Less than to greater than → KILLED  
 14. Less than to greater or equal → KILLED  
 15. Less than to equal → KILLED  
 16. Less than to not equal → SURVIVED  
 17. Incremented (a++) integer local variable number 6 → KILLED  
 18. Decrementd (a--) integer local variable number 6 → KILLED  
 19. Incremented (a++) integer local variable number 6 → KILLED  
 20. Decrementd (--a) integer local variable number 6 → KILLED  
 154 1. Negated integer local variable number 6 → KILLED  
 2. Negated integer array field → KILLED  
 3. Incremented (a++) integer local variable number 6 → KILLED



4. Incremented (++ ) integer array field → KILLED  
 5. Decrementd (a-- ) integer local variable number 6 → KILLED  
 6. Decrementd (a-- ) integer array field → KILLED  
 7. Incremented (++a) integer local variable number 6 → KILLED  
 8. Incremented (++a) integer array field → KILLED  
 9. Decrementd (--a) integer local variable number 6 → KILLED  
 10. Decrementd (--a) integer array field → KILLED  
 1. changed conditional boundary → KILLED  
 2. negated conditional → KILLED  
 3. removed conditional - replaced comparison check with false → KILLED  
 4. removed conditional - replaced comparison check with true → KILLED  
 5. Negated integer local variable number 7 → KILLED  
 6. Negated integer local variable number 5 → KILLED  
 7. greater or equal to less than → KILLED  
 8. greater or equal to less or equal → KILLED  
 9. greater or equal to greater than → KILLED  
 10. greater or equal to equal → KILLED  
 11. greater or equal to not equal → KILLED  
 12. Incremented (++ ) integer local variable number 7 → KILLED  
 13. Incremented (++ ) integer local variable number 5 → KILLED  
 14. Decrementd (a-- ) integer local variable number 7 → KILLED  
 15. Decrementd (a-- ) integer local variable number 5 → KILLED  
 16. Incremented (++a) integer local variable number 7 → KILLED  
 17. Incremented (++a) integer local variable number 5 → KILLED  
 18. Decrementd (--a) integer local variable number 7 → KILLED  
 19. Decrementd (--a) integer local variable number 5 → KILLED  
 1. removed call to org/jfree/data/Values2D::getValue → KILLED  
 2. Negated integer local variable number 7 → KILLED  
 3. Negated integer local variable number 1 → KILLED  
 4. Incremented (++ ) integer local variable number 7 → SURVIVED  
 5. Incremented (++ ) integer local variable number 1 → KILLED  
 6. Decrementd (a-- ) integer local variable number 7 → SURVIVED  
 7. Decrementd (a-- ) integer local variable number 1 → KILLED  
 8. Incremented (++a) integer local variable number 7 → KILLED  
 9. Incremented (++a) integer local variable number 1 → KILLED  
 10. Decrementd (--a) integer local variable number 7 → KILLED  
 11. Decrementd (--a) integer local variable number 1 → KILLED  
 1. negated conditional → KILLED  
 2. removed conditional - replaced equality check with false → KILLED  
 3. removed conditional - replaced equality check with true → KILLED  
 4. equal to not equal → KILLED  
 1. Replaced double addition with subtraction → KILLED  
 2. removed call to java/lang/Number::doubleValue → KILLED  
 3. Negated double local variable number 3 → KILLED  
 4. Replaced double operation with first member → KILLED  
 5. Replaced double operation by second member → KILLED  
 6. Replaced double addition with subtraction → KILLED  
 7. Replaced double addition with multiplication → KILLED  
 8. Replaced double addition with division → KILLED  
 9. Replaced double addition with modulus → KILLED  
 10. Incremented (++ ) double local variable number 3 → SURVIVED  
 11. Decrementd (a-- ) double local variable number 3 → SURVIVED  
 12. Incremented (++a) double local variable number 3 → KILLED  
 13. Decrementd (--a) double local variable number 3 → KILLED  
 1. replaced double return with 0.0d for org/jfree/data/DataUtilities::calculateColumnTotal → KILLED  
 2. replaced return of double value with -(x + 1) for org/jfree/data/DataUtilities::calculateColumnTotal → KILLED  
 3. Negated double local variable number 3 → KILLED  
 4. Incremented (++ ) double local variable number 3 → SURVIVED  
 5. Decrementd (a-- ) double local variable number 3 → SURVIVED  
 6. Incremented (++a) double local variable number 3 → KILLED  
 7. Decrementd (--a) double local variable number 3 → KILLED  
 1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted → KILLED  
 1. Substituted 0.0 with 1.0 → KILLED  
 2. Substituted 0.0 with 1.0 → KILLED  
 3. Substituted 0.0 with -1.0 → KILLED  
 4. Substituted 0.0 with 1.0 → KILLED  
 5. Substituted 0.0 with -1.0 → KILLED  
 1. removed call to org/jfree/data/Values2D::getColumnCount → KILLED  
 1. changed conditional boundary → KILLED  
 2. Changed increment from 1 to -1 → KILLED  
 3. Substituted 0 with 1 → KILLED  
 4. negated conditional → KILLED  
 5. removed conditional - replaced comparison check with false → KILLED  
 6. removed conditional - replaced comparison check with true → KILLED  
 7. Negated integer local variable number 5 → KILLED  
 8. Negated integer local variable number 4 → KILLED  
 9. Substituted 0 with 1 → KILLED  
 10. Substituted 0 with -1 → KILLED  
 11. Substituted 0 with 1 → KILLED  
 12. Substituted 0 with -1 → KILLED  
 13. Less than to less or equal → KILLED  
 14. Less than to greater than → KILLED  
 15. Less than to greater or equal → KILLED  
 16. Less than to equal → KILLED  
 17. Less than to not equal → SURVIVED  
 18. Incremented (++ ) integer local variable number 5 → KILLED  
 19. Incremented (++ ) integer local variable number 4 → KILLED  
 20. Decrementd (a-- ) integer local variable number 5 → KILLED



21. Decrementd (a--) integer local variable number 4 → KILLED  
 22. Incremented (++a) integer local variable number 5 → KILLED  
 23. Incremented (++a) integer local variable number 4 → KILLED  
 24. Decrementd (--a) integer local variable number 5 → KILLED  
 25. Decrementd (--a) integer local variable number 4 → KILLED  
 1. removed call to org/jfree/data/Values2D::getValue → KILLED  
 2. Negated integer local variable number 1 → KILLED  
 3. Negated integer local variable number 5 → KILLED  
 4. Incremented (++a) integer local variable number 1 → KILLED  
 5. Incremented (++a) integer local variable number 5 → KILLED  
 179 6. Decrementd (a--) integer local variable number 1 → KILLED  
 7. Decrementd (a--) integer local variable number 5 → KILLED  
 8. Incremented (++a) integer local variable number 1 → KILLED  
 9. Incremented (++a) integer local variable number 5 → KILLED  
 10. Decrementd (--a) integer local variable number 1 → KILLED  
 11. Decrementd (--a) integer local variable number 5 → KILLED  
 1. negated conditional → KILLED  
 180 2. removed conditional - replaced equality check with false → KILLED  
 3. removed conditional - replaced equality check with true → KILLED  
 4. equal to not equal → KILLED  
 1. Replaced double addition with subtraction → KILLED  
 2. removed call to java/lang/Number::doubleValue → KILLED  
 3. Negated double local variable number 2 → KILLED  
 4. Replaced double operation with first member → KILLED  
 5. Replaced double operation by second member → KILLED  
 6. Replaced double addition with subtraction → KILLED  
 181 7. Replaced double addition with multiplication → KILLED  
 8. Replaced double addition with division → KILLED  
 9. Replaced double addition with modulus → KILLED  
 10. Incremented (++a) double local variable number 2 → SURVIVED  
 11. Decrementd (a--) double local variable number 2 → SURVIVED  
 12. Incremented (++a) double local variable number 2 → KILLED  
 13. Decrementd (--a) double local variable number 2 → KILLED  
 1. replaced double return with 0.0d for org/jfree/data/DataUtilities::calculateRowTotal → KILLED  
 2. replaced return of double value with -(x + 1) for org/jfree/data/DataUtilities::calculateRowTotal → KILLED  
 3. Negated double local variable number 2 → KILLED  
 184 4. Incremented (++a) double local variable number 2 → SURVIVED  
 5. Decrementd (a--) double local variable number 2 → SURVIVED  
 6. Incremented (++a) double local variable number 2 → KILLED  
 7. Decrementd (--a) double local variable number 2 → KILLED  
 201 1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted → KILLED  
 1. Substituted 0.0 with 1.0 → KILLED  
 2. Substituted 0.0 with 1.0 → KILLED  
 202 3. Substituted 0.0 with -1.0 → KILLED  
 4. Substituted 0.0 with 1.0 → KILLED  
 5. Substituted 0.0 with -1.0 → KILLED  
 203 1. removed call to org/jfree/data/Values2D::getColumnCount → KILLED  
 1. changed conditional boundary → KILLED  
 2. Changed increment from 1 to -1 → KILLED  
 3. Substituted 0 with 1 → KILLED  
 4. negated conditional → KILLED  
 5. removed conditional - replaced comparison check with false → KILLED  
 6. removed conditional - replaced comparison check with true → KILLED  
 7. Negated integer local variable number 6 → KILLED  
 8. Substituted 0 with 1 → KILLED  
 9. Substituted 0 with -1 → KILLED  
 204 10. Substituted 0 with 1 → KILLED  
 11. Substituted 0 with -1 → KILLED  
 12. Less than to less or equal → KILLED  
 13. Less than to greater than → KILLED  
 14. Less than to greater or equal → KILLED  
 15. Less than to equal → KILLED  
 16. Less than to not equal → SURVIVED  
 17. Incremented (++a) integer local variable number 6 → KILLED  
 18. Decrementd (a--) integer local variable number 6 → KILLED  
 19. Incremented (++a) integer local variable number 6 → KILLED  
 20. Decrementd (--a) integer local variable number 6 → KILLED  
 1. Negated integer local variable number 6 → KILLED  
 2. Negated integer array field → KILLED  
 3. Incremented (++a) integer local variable number 6 → KILLED  
 4. Incremented (++a) integer array field → SURVIVED  
 205 5. Decrementd (a--) integer local variable number 6 → KILLED  
 6. Decrementd (a--) integer array field → SURVIVED  
 7. Incremented (++a) integer local variable number 6 → KILLED  
 8. Incremented (++a) integer array field → KILLED  
 9. Decrementd (--a) integer local variable number 6 → KILLED  
 10. Decrementd (--a) integer array field → KILLED  
 206 1. changed conditional boundary → KILLED  
 2. negated conditional → KILLED  
 3. removed conditional - replaced comparison check with false → KILLED  
 4. removed conditional - replaced comparison check with true → KILLED  
 5. Negated integer local variable number 7 → KILLED  
 6. Negated integer local variable number 5 → KILLED  
 7. greater or equal to less than → KILLED  
 8. greater or equal to less or equal → KILLED  
 9. greater or equal to greater than → KILLED  
 10. greater or equal to equal → KILLED

11. greater or equal to not equal → KILLED  
 12. Incremented (a++) integer local variable number 7 → KILLED  
 13. Incremented (a++) integer local variable number 5 → SURVIVED  
 14. Decrementd (a--) integer local variable number 7 → KILLED  
 15. Decrementd (a--) integer local variable number 5 → KILLED  
 16. Incremented (a++) integer local variable number 7 → KILLED  
 17. Incremented (a++) integer local variable number 5 → KILLED  
 18. Decrementd (--a) integer local variable number 7 → KILLED  
 19. Decrementd (--a) integer local variable number 5 → KILLED  
 1. removed call to org/jfree/data/Values2D::getValue → KILLED  
 2. Negated integer local variable number 1 → KILLED  
 3. Negated integer local variable number 7 → KILLED  
 4. Incremented (a++) integer local variable number 1 → KILLED  
 5. Incremented (a++) integer local variable number 7 → SURVIVED  
 207 6. Decrementd (a--) integer local variable number 1 → KILLED  
 7. Decrementd (a--) integer local variable number 7 → SURVIVED  
 8. Incremented (a++) integer local variable number 1 → KILLED  
 9. Incremented (a++) integer local variable number 7 → KILLED  
 10. Decrementd (--a) integer local variable number 1 → KILLED  
 11. Decrementd (--a) integer local variable number 7 → KILLED  
 1. negated conditional → KILLED  
 208 2. removed conditional - replaced equality check with false → KILLED  
 3. removed conditional - replaced equality check with true → KILLED  
 4. equal to not equal → KILLED  
 1. Replaced double addition with subtraction → KILLED  
 2. removed call to java/lang/Number::doubleValue → KILLED  
 3. Negated double local variable number 3 → KILLED  
 4. Replaced double operation with first member → KILLED  
 5. Replaced double operation by second member → KILLED  
 6. Replaced double addition with subtraction → KILLED  
 209 7. Replaced double addition with multiplication → KILLED  
 8. Replaced double addition with division → KILLED  
 9. Replaced double addition with modulus → KILLED  
 10. Incremented (a++) double local variable number 3 → SURVIVED  
 11. Decrementd (a--) double local variable number 3 → SURVIVED  
 12. Incremented (a++) double local variable number 3 → KILLED  
 13. Decrementd (--a) double local variable number 3 → KILLED  
 1. replaced double return with 0.0d for org/jfree/data/DataUtilities::calculateRowTotal → KILLED  
 2. replaced return of double value with -(x + 1) for org/jfree/data/DataUtilities::calculateRowTotal → KILLED  
 3. Negated double local variable number 3 → KILLED  
 213 4. Incremented (a++) double local variable number 3 → SURVIVED  
 5. Decrementd (a--) double local variable number 3 → SURVIVED  
 6. Incremented (a++) double local variable number 3 → KILLED  
 7. Decrementd (--a) double local variable number 3 → KILLED  
 225 1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted → KILLED  
 1. changed conditional boundary → KILLED  
 2. Substituted 0 with 1 → KILLED  
 3. negated conditional → KILLED  
 4. removed conditional - replaced comparison check with false → KILLED  
 5. removed conditional - replaced comparison check with true → KILLED  
 6. Negated integer local variable number 2 → KILLED  
 7. Substituted 0 with 1 → KILLED  
 8. Substituted 0 with -1 → KILLED  
 9. Substituted 0 with 1 → KILLED  
 227 10. Substituted 0 with -1 → KILLED  
 11. Less than to less or equal → KILLED  
 12. Less than to greater than → KILLED  
 13. Less than to greater or equal → KILLED  
 14. Less than to equal → KILLED  
 15. Less than to not equal → KILLED  
 16. Incremented (a++) integer local variable number 2 → KILLED  
 17. Decrementd (a--) integer local variable number 2 → KILLED  
 18. Incremented (a++) integer local variable number 2 → KILLED  
 19. Decrementd (--a) integer local variable number 2 → KILLED  
 1. removed call to java/lang/Double::<init> → KILLED  
 2. Negated integer local variable number 2 → KILLED  
 3. Negated integer local variable number 2 → KILLED  
 4. Negated double array field → KILLED  
 5. Incremented (a++) integer local variable number 2 → KILLED  
 6. Incremented (a++) integer local variable number 2 → KILLED  
 7. Incremented (a++) double array field → KILLED  
 228 8. Decrementd (a--) integer local variable number 2 → KILLED  
 9. Decrementd (a--) integer local variable number 2 → TIMED\_OUT  
 10. Decrementd (a--) double array field → KILLED  
 11. Incremented (a++) integer local variable number 2 → KILLED  
 12. Incremented (a++) integer local variable number 2 → KILLED  
 13. Incremented (a++) double array field → KILLED  
 14. Decrementd (--a) integer local variable number 2 → KILLED  
 15. Decrementd (--a) integer local variable number 2 → KILLED  
 16. Decrementd (--a) double array field → KILLED  
 1. replaced return value with null for org/jfree/data/DataUtilities::createNumberArray → KILLED  
 230 2. mutated return of Object value for org/jfree/data/DataUtilities::createNumberArray to ( if (x != null) null  
 else throw new RuntimeException ) → KILLED  
 242 1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted → KILLED  
 244 1. Negated integer local variable number 1 → KILLED  
 2. Incremented (a++) integer local variable number 1 → KILLED  
 3. Decrementd (a--) integer local variable number 1 → KILLED

4. Incremented (++a) integer local variable number 1 → KILLED  
5. Decrementd (--a) integer local variable number 1 → KILLED  
1. changed conditional boundary → KILLED  
2. Changed increment from 1 to -1 → KILLED  
3. Substituted 0 with 1 → KILLED  
4. negated conditional → KILLED  
5. removed conditional - replaced comparison check with false → KILLED  
6. removed conditional - replaced comparison check with true → KILLED  
7. Negated integer local variable number 3 → KILLED  
8. Negated integer local variable number 1 → KILLED  
9. Substituted 0 with 1 → KILLED  
10. Substituted 0 with -1 → KILLED  
11. Substituted 0 with 1 → KILLED  
12. Substituted 0 with -1 → KILLED  
245 13. Less than to less or equal → KILLED  
14. Less than to greater than → KILLED  
15. Less than to greater or equal → KILLED  
16. Less than to equal → KILLED  
17. Less than to not equal → SURVIVED  
18. Incremented (a++) integer local variable number 3 → KILLED  
19. Incremented (a++) integer local variable number 1 → KILLED  
20. Decrementd (a--) integer local variable number 3 → KILLED  
21. Decrementd (a--) integer local variable number 1 → KILLED  
22. Incremented (++a) integer local variable number 3 → KILLED  
23. Incremented (++a) integer local variable number 1 → KILLED  
24. Decrementd (--a) integer local variable number 3 → KILLED  
25. Decrementd (--a) integer local variable number 1 → KILLED  
1. removed call to org/jfree/data/DataUtilities::createNumberArray → KILLED  
2. Negated integer local variable number 3 → KILLED  
3. Negated integer local variable number 3 → KILLED  
4. Incremented (a++) integer local variable number 3 → KILLED  
5. Incremented (a++) integer local variable number 3 → KILLED  
246 6. Decrementd (a--) integer local variable number 3 → KILLED  
7. Decrementd (a--) integer local variable number 3 → TIMED\_OUT  
8. Incremented (++a) integer local variable number 3 → KILLED  
9. Incremented (++a) integer local variable number 3 → KILLED  
10. Decrementd (--a) integer local variable number 3 → KILLED  
11. Decrementd (--a) integer local variable number 3 → KILLED  
1. replaced return value with null for org/jfree/data/DataUtilities::createNumberArray2D → KILLED  
248 2. mutated return of Object value for org/jfree/data/DataUtilities::createNumberArray2D to ( if (x != null) null  
else throw new RuntimeException ) → KILLED  
262 1. removed call to org/jfree/chart/util/ParamChecks::nullNotPermitted → KILLED  
263 1. removed call to org/jfree/data/DefaultKeyedValues::<init> → KILLED  
1. Substituted 0.0 with 1.0 → KILLED  
2. Substituted 0.0 with 1.0 → KILLED  
264 3. Substituted 0.0 with -1.0 → KILLED  
4. Substituted 0.0 with 1.0 → KILLED  
5. Substituted 0.0 with -1.0 → KILLED  
1. changed conditional boundary → KILLED  
2. Substituted 0 with 1 → KILLED  
3. negated conditional → KILLED  
4. removed call to org/jfree/data/KeyedValues::getItemCount → KILLED  
5. removed conditional - replaced comparison check with false → KILLED  
6. removed conditional - replaced comparison check with true → KILLED  
7. Negated integer local variable number 4 → KILLED  
8. Substituted 0 with 1 → KILLED  
9. Substituted 0 with -1 → KILLED  
265 10. Substituted 0 with 1 → KILLED  
11. Substituted 0 with -1 → KILLED  
12. Less than to less or equal → KILLED  
13. Less than to greater than → KILLED  
14. Less than to greater or equal → KILLED  
15. Less than to equal → KILLED  
16. Less than to not equal → SURVIVED  
17. Incremented (a++) integer local variable number 4 → KILLED  
18. Decrementd (a--) integer local variable number 4 → KILLED  
19. Incremented (++a) integer local variable number 4 → KILLED  
20. Decrementd (--a) integer local variable number 4 → KILLED  
1. removed call to org/jfree/data/KeyedValues::getValue → KILLED  
2. Negated integer local variable number 4 → KILLED  
266 3. Incremented (a++) integer local variable number 4 → KILLED  
4. Decrementd (a--) integer local variable number 4 → TIMED\_OUT  
5. Incremented (++a) integer local variable number 4 → KILLED  
6. Decrementd (--a) integer local variable number 4 → KILLED  
1. negated conditional → KILLED  
267 2. removed conditional - replaced equality check with false → KILLED  
3. removed conditional - replaced equality check with true → KILLED  
4. equal to not equal → KILLED  
268 1. replaced call to java/lang/Math::abs with argument → KILLED  
2. Replaced double addition with subtraction → KILLED  
3. removed call to java/lang/Number::doubleValue → KILLED  
4. removed call to java/lang/Math::abs → KILLED  
5. Negated double local variable number 2 → KILLED  
6. Replaced double operation with first member → KILLED  
7. Replaced double operation by second member → KILLED  
8. Replaced double addition with subtraction → KILLED  
9. Replaced double addition with multiplication → KILLED

10. Replaced double addition with division → KILLED  
11. Replaced double addition with modulus → KILLED  
12. Incremented (a++) double local variable number 2 → SURVIVED  
13. Decrementd (a--) double local variable number 2 → SURVIVED  
14. Incremented (++a) double local variable number 2 → KILLED  
15. Decrementd (--a) double local variable number 2 → KILLED

271 1. Substituted 0.0 with 1.0 → KILLED  
2. Substituted 0.0 with 1.0 → KILLED  
3. Substituted 0.0 with -1.0 → KILLED  
4. Substituted 0.0 with 1.0 → KILLED  
5. Substituted 0.0 with -1.0 → KILLED

1. changed conditional boundary → KILLED  
2. Substituted 0 with 1 → KILLED  
3. negated conditional → KILLED  
4. removed call to org/jfree/data/KeyedValues::getItemCount → KILLED  
5. removed conditional - replaced comparison check with false → KILLED  
6. removed conditional - replaced comparison check with true → KILLED  
7. Negated integer local variable number 8 → KILLED  
8. Substituted 0 with 1 → KILLED  
9. Substituted 0 with -1 → KILLED

272 10. Substituted 0 with 1 → KILLED  
11. Substituted 0 with -1 → KILLED  
12. Less than to less or equal → KILLED  
13. Less than to greater than → KILLED  
14. Less than to greater or equal → KILLED  
15. Less than to equal → KILLED  
16. Less than to not equal → SURVIVED  
17. Incremented (a++) integer local variable number 8 → KILLED  
18. Decrementd (a--) integer local variable number 8 → KILLED  
19. Incremented (++a) integer local variable number 8 → KILLED  
20. Decrementd (--a) integer local variable number 8 → KILLED

273 1. removed call to org/jfree/data/KeyedValues::getValue → KILLED  
2. Negated integer local variable number 8 → KILLED  
3. Incremented (a++) integer local variable number 8 → KILLED  
4. Decrementd (a--) integer local variable number 8 → KILLED  
5. Incremented (++a) integer local variable number 8 → KILLED  
6. Decrementd (--a) integer local variable number 8 → KILLED

274 1. negated conditional → KILLED  
2. removed conditional - replaced equality check with false → KILLED  
3. removed conditional - replaced equality check with true → KILLED  
4. equal to not equal → KILLED

1. replaced call to java/lang/Math::abs with argument → KILLED  
2. Replaced double addition with subtraction → KILLED  
3. removed call to java/lang/Number::doubleValue → KILLED  
4. removed call to java/lang/Math::abs → KILLED  
5. Negated double local variable number 6 → KILLED  
6. Replaced double operation with first member → KILLED  
7. Replaced double operation by second member → KILLED

275 8. Replaced double addition with subtraction → KILLED  
9. Replaced double addition with multiplication → KILLED  
10. Replaced double addition with division → KILLED  
11. Replaced double addition with modulus → KILLED  
12. Incremented (a++) double local variable number 6 → SURVIVED  
13. Decrementd (a--) double local variable number 6 → SURVIVED  
14. Incremented (++a) double local variable number 6 → KILLED  
15. Decrementd (--a) double local variable number 6 → KILLED

1. removed call to java/lang/Double::<init> → KILLED  
2. Replaced double division with multiplication → KILLED  
3. removed call to org/jfree/data/KeyedValues::getKey → KILLED  
4. removed call to org/jfree/data/DefaultKeyedValues::addValue → KILLED  
5. Negated integer local variable number 8 → KILLED  
6. Negated double local variable number 6 → KILLED  
7. Negated double local variable number 2 → KILLED  
8. Replaced double operation with first member → KILLED  
9. Replaced double operation by second member → KILLED  
10. Replaced double division with multiplication → KILLED  
11. Replaced double division with modulus → KILLED  
12. Replaced double division with addition → KILLED

277 13. Replaced double division with subtraction → KILLED  
14. Incremented (a++) integer local variable number 8 → KILLED  
15. Incremented (a++) double local variable number 6 → KILLED  
16. Incremented (a++) double local variable number 2 → KILLED  
17. Decrementd (a--) integer local variable number 8 → TIMED\_OUT  
18. Decrementd (a--) double local variable number 6 → KILLED  
19. Decrementd (a--) double local variable number 2 → KILLED  
20. Incremented (++a) integer local variable number 8 → KILLED  
21. Incremented (++a) double local variable number 6 → KILLED  
22. Incremented (++a) double local variable number 2 → KILLED  
23. Decrementd (--a) integer local variable number 8 → KILLED  
24. Decrementd (--a) double local variable number 6 → KILLED  
25. Decrementd (--a) double local variable number 2 → KILLED

279 1. replaced return value with null for org/jfree/data/DataUtilities::getCumulativePercentages → KILLED  
2. mutated return of Object value for org/jfree/data/DataUtilities::getCumulativePercentages to ( if (x != null)  
null else throw new RuntimeException ) → KILLED

## Active mutators

- ABS\_MUTATOR
- AOD\_1\_MUTATOR
- AOD\_2\_MUTATOR
- AOR\_1\_MUTATOR
- AOR\_2\_MUTATOR
- AOR\_3\_MUTATOR
- AOR\_4\_MUTATOR
- ARGUMENT\_PROPAGATION\_MUTATOR
- BOOLEAN\_FALSE\_RETURN
- BOOLEAN\_TRUE\_RETURN
- CONDITIONALS\_BOUNDARY\_MUTATOR
- CONSTRUCTOR\_CALL\_MUTATOR
- CRCR\_1\_MUTATOR
- CRCR\_2\_MUTATOR
- CRCR\_3\_MUTATOR
- CRCR\_4\_MUTATOR
- CRCR\_5\_MUTATOR
- CRCR\_6\_MUTATOR
- EMPTY\_RETURN\_VALUES
- EXPERIMENTAL\_BIGINTEGER\_MUTATOR
- EXPERIMENTAL\_MEMBER\_VARIABLE\_MUTATOR
- EXPERIMENTAL\_REMOVE\_SWITCH\_MUTATOR\_[0-99]
- EXPERIMENTAL\_SWITCH\_MUTATOR
- INCREMENTS\_MUTATOR
- INLINE\_CONSTANT\_MUTATOR
- INVERT\_NEGS\_MUTATOR
- MATH\_MUTATOR
- NAKED\_RECEIVER
- NEGATE\_CONDITIONALS\_MUTATOR
- NON\_VOID\_METHOD\_CALL\_MUTATOR
- NULL\_RETURN\_VALUES
- OBBN\_1\_MUTATOR
- OBBN\_2\_MUTATOR
- OBBN\_3\_MUTATOR
- PRIMITIVE\_RETURN\_VALS\_MUTATOR
- REMOVE\_CONDITIONALS\_EQUAL\_ELSE\_MUTATOR
- REMOVE\_CONDITIONALS\_EQUAL\_IF\_MUTATOR
- REMOVE\_CONDITIONALS\_ORDER\_ELSE\_MUTATOR
- REMOVE\_CONDITIONALS\_ORDER\_IF\_MUTATOR
- REMOVE\_INCREMENTS\_MUTATOR
- RETURN\_VALS\_MUTATOR
- ROR\_1\_MUTATOR
- ROR\_2\_MUTATOR
- ROR\_3\_MUTATOR
- ROR\_4\_MUTATOR
- ROR\_5\_MUTATOR
- UOI\_1\_MUTATOR
- UOI\_2\_MUTATOR
- UOI\_3\_MUTATOR
- UOI\_4\_MUTATOR
- VOID\_METHOD\_CALL\_MUTATOR

## Tests examined

- org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest.testNullValues(org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest) (1 ms)
- org.jfree.data.test.mutationIncreaseDataUtilities.test(org.jfree.data.test.mutationIncreaseDataUtilities) (1 ms)
- org.jfree.data.test.createNumberArr2DTest.testZzero(org.jfree.data.test.createNumberArr2DTest) (0 ms)
- org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest.testArrayValues(org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest) (2 ms)
- org.jfree.data.test.createNumberArr2DTest.testEmpty2D(org.jfree.data.test.createNumberArr2DTest) (1 ms)
- org.jfree.data.test.increaseMutationScoreDataUtil.increaseCreateNumberArray2D(org.jfree.data.test.increaseMutationScoreDataUtil) (1 ms)
- org.jfree.data.test.DataUtilitiesCalcRowTotalTest.calculateRowTotalOnBoundary(org.jfree.data.test.DataUtilitiesCalcRowTotalTest) (1 ms)
- org.jfree.data.test.DataUtilitiesCalcRowTotalTest.calcRowNullTest(org.jfree.data.test.DataUtilitiesCalcRowTotalTest) (1 ms)
- org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest.testCCTAEmptyValidRows(org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest) (0 ms)
- org.jfree.data.test.createNumberArr2DTest.testValid2D(org.jfree.data.test.createNumberArr2DTest) (0 ms)
- org.jfree.data.test.TestDataUtilitiesCumulativePercentages.testNonSequentialList(org.jfree.data.test.TestDataUtilitiesCumulativePercentages) (0 ms)
- org.jfree.data.test.DataUtilitiesClone.testNull(org.jfree.data.test.DataUtilitiesClone) (0 ms)
- org.jfree.data.test.TestDataUtilitiesCumulativePercentages.testSequentialListWithNegativeValues(org.jfree.data.test.TestDataUtilitiesCumulativePercentages) (1 ms)
- org.jfree.data.test.TestDataUtilitiesCumulativePercentages.testNullDataReturn(org.jfree.data.test.TestDataUtilitiesCumulativePercentages) (1 ms)
- org.jfree.data.test.DataUtilitiesCalcRowTotalTest.calculateRowTotalOutOfBounds(org.jfree.data.test.DataUtilitiesCalcRowTotalTest) (1 ms)
- org.jfree.data.test.DataUtilitiesTestEqual.testABNull(org.jfree.data.test.DataUtilitiesTestEqual) (1 ms)
- org.jfree.data.test.increaseMutationScoreDataUtil.nullArgCalcRowTotal(org.jfree.data.test.increaseMutationScoreDataUtil) (0 ms)
- org.jfree.data.test.testColumnTotal.testColTest(org.jfree.data.test.testColumnTotal) (1 ms)
- org.jfree.data.test.testColumnTotal.testBoundary(org.jfree.data.test.testColumnTotal) (1 ms)
- org.jfree.data.test.testColumnTotal.nullCell(org.jfree.data.test.testColumnTotal) (1 ms)
- org.jfree.data.test.testColumnTotal.testOutsideBoundary(org.jfree.data.test.testColumnTotal) (0 ms)
- org.jfree.data.test.DataUtilitiesClone.testSymmetrical(org.jfree.data.test.DataUtilitiesClone) (0 ms)
- org.jfree.data.test.rowTotalWithArray.negativeValidCols(org.jfree.data.test.rowTotalWithArray) (1 ms)
- org.jfree.data.test.createNumberArr2DTest.testPartialEmpty2D(org.jfree.data.test.createNumberArr2DTest) (0 ms)
- org.jfree.data.test.DataUtilitiesCalcRowTotalTest.calculateRowTotalNegativeRows(org.jfree.data.test.DataUtilitiesCalcRowTotalTest) (1 ms)
- org.jfree.data.test.createNumberArrayTest.zeroTest(org.jfree.data.test.createNumberArrayTest) (0 ms)
- org.jfree.data.test.DataUtilitiesCalcRowTotalTest.testNullEntry(org.jfree.data.test.DataUtilitiesCalcRowTotalTest) (1 ms)
- org.jfree.data.test.TestDataUtilitiesCumulativePercentages.testSequentialList(org.jfree.data.test.TestDataUtilitiesCumulativePercentages) (1 ms)
- org.jfree.data.test.mutationIncreaseDataUtilities.nullNotPermittedNumberArray(org.jfree.data.test.mutationIncreaseDataUtilities) (0 ms)
- org.jfree.data.test.testColumnTotal.testValidParameters(org.jfree.data.test.testColumnTotal) (1 ms)
- org.jfree.data.test.increaseMutationScoreDataUtil.nullArgCalcRow(org.jfree.data.test.increaseMutationScoreDataUtil) (0 ms)
- org.jfree.data.test.rowTotalWithArray.allValid(org.jfree.data.test.rowTotalWithArray) (1 ms)
- org.jfree.data.test.increaseMutationScoreDataUtil.increaseCreateNumberArray2DTwo(org.jfree.data.test.increaseMutationScoreDataUtil) (2 ms)

- org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest.testCCTAValid(org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest) (1 ms)
- org.jfree.data.test.createNumberArrayTest.PositiveTest(org.jfree.data.test.createNumberArrayTest) (1 ms)
- org.jfree.data.test.rowTotalWithArray.emptyValidCols(org.jfree.data.test.rowTotalWithArray) (1 ms)
- org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest.testCCTAExtraValidRows(org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest) (1 ms)
- org.jfree.data.test.createNumberArr2DTest.testNull2D(org.jfree.data.test.createNumberArr2DTest) (1 ms)
- org.jfree.data.test.mutationIncreaseDataUtilities.nullPermitTest(org.jfree.data.test.mutationIncreaseDataUtilities) (0 ms)
- org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest.testCCTAENegativeValidValues(org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest) (0 ms)
- org.jfree.data.test.DataUtilitiesTestEqual.testEqualSimple(org.jfree.data.test.DataUtilitiesTestEqual) (1 ms)
- org.jfree.data.test.DataUtilitiesCalcRowTotalTest.calcRowNoValues(org.jfree.data.test.DataUtilitiesCalcRowTotalTest) (27 ms)
- org.jfree.data.test.DataUtilitiesTestEqual.testNotEqualSimple(org.jfree.data.test.DataUtilitiesTestEqual) (1 ms)
- org.jfree.data.test.testColumnTotal.testEmpty(org.jfree.data.test.testColumnTotal) (1 ms)
- org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest.testCCTANullData(org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest) (1 ms)
- org.jfree.data.test.DataUtilitiesClone.testNullRow(org.jfree.data.test.DataUtilitiesClone) (1 ms)
- org.jfree.data.test.rowTotalWithArray.nullTest(org.jfree.data.test.rowTotalWithArray) (1 ms)
- org.jfree.data.test.increaseMutationScoreDataUtil.nullCell(org.jfree.data.test.increaseMutationScoreDataUtil) (1 ms)
- org.jfree.data.test.DataUtilitiesTestEqual.testCompletelyDifferent(org.jfree.data.test.DataUtilitiesTestEqual) (0 ms)
- org.jfree.data.test.DataUtilitiesTestEqual.testANull(org.jfree.data.test.DataUtilitiesTestEqual) (0 ms)
- org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest.testRowExceeding(org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest) (0 ms)
- org.jfree.data.test.createNumberArrayTest.nullTester(org.jfree.data.test.createNumberArrayTest) (1 ms)
- org.jfree.data.test.testColumnTotal.testNegative(org.jfree.data.test.testColumnTotal) (1 ms)
- org.jfree.data.test.DataUtilitiesClone.testAssymetrical(org.jfree.data.test.DataUtilitiesClone) (1 ms)
- org.jfree.data.test.rowTotalWithArray.nullValidCols(org.jfree.data.test.rowTotalWithArray) (1 ms)
- org.jfree.data.test.DataUtilitiesTestEqual.testLengthsUnequalButSwitched(org.jfree.data.test.DataUtilitiesTestEqual) (0 ms)
- org.jfree.data.test.DataUtilitiesCalcRowTotalTest.calculateRowTotalTwoValid(org.jfree.data.test.DataUtilitiesCalcRowTotalTest) (1 ms)
- org.jfree.data.test.TestDataUtilitiesCumulativePercentages.testDataThrowsUnexpectedException(org.jfree.data.test.TestDataUtilitiesCumulativePercentages) (8 ms)
- org.jfree.data.test.rowTotalWithArray.greaterValidCols(org.jfree.data.test.rowTotalWithArray) (1 ms)
- org.jfree.data.test.createNumberArr2DTest.testValid2DNegatives(org.jfree.data.test.createNumberArr2DTest) (1 ms)
- org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest.testCCTAOutOfBoundsColumn(org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest) (0 ms)
- org.jfree.data.test.DataUtilitiesCalcRowTotalTest.calcRowTotalWithNegatives(org.jfree.data.test.DataUtilitiesCalcRowTotalTest) (1 ms)
- org.jfree.data.test.DataUtilitiesTestEqual.testEveryOtherSame(org.jfree.data.test.DataUtilitiesTestEqual) (1 ms)
- org.jfree.data.test.rowTotalWithArray.onBound(org.jfree.data.test.rowTotalWithArray) (1 ms)
- org.jfree.data.test.DataUtilitiesTestEqual.testBNull(org.jfree.data.test.DataUtilitiesTestEqual) (0 ms)
- org.jfree.data.test.DataUtilitiesTestEqual.testLengthsUnequal(org.jfree.data.test.DataUtilitiesTestEqual) (0 ms)
- org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest.testCCTABoundaryColumn(org.jfree.data.test.DataUtilitiesCalculateColumnTotalArrayTest) (0 ms)
- org.jfree.data.test.TestDataUtilitiesCumulativePercentages.testNullArgPassed(org.jfree.data.test.TestDataUtilitiesCumulativePercentages) (0 ms)
- org.jfree.data.test.rowTotalWithArray.negativeRowCalc(org.jfree.data.test.rowTotalWithArray) (1 ms)
- org.jfree.data.test.createNumberArrayTest.negativeTest(org.jfree.data.test.createNumberArrayTest) (0 ms)