Oracle America, Inc. v. Google Inc.

## **EXHIBIT C**

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```
1
    /*
     * @(#)Comparable.java 1.22 03/12/19
2
3
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4
5
     * SUN PROPRIETARY/CONFIDENTIAL. Use is subject to license terms.
6
7
    package java.lang;
8
9
10
    /**
     * This interface imposes a total ordering on the objects of each class that
11
     * implements it. This ordering is referred to as the class's <i>natural
12
     * ordering</i>, and the class's <tt>compareTo</tt> method is referred to as
13
     * its <i>natural comparison method</i>.
14
15
     * Lists (and arrays) of objects that implement this interface can be sorted
16
17
     *
       automatically by <tt>Collections.sort</tt> (and <tt>Arrays.sort</tt>).
18
     * Objects that implement this interface can be used as keys in a sorted map
19
     * or elements in a sorted set, without the need to specify a comparator.
20
     * The natural ordering for a class <tt>C</tt> is said to be <i>consistent
21
     * with equals</i> if and only if <tt>(e1.compareTo((0bject)e2) == 0)</tt> has
22
     * the same boolean value as <tt>e1.equals((Object)e2)</tt> for every
23
     * <tt>e1</tt> and <tt>e2</tt> of class <tt>C</tt>. Note that <tt>null</tt>
24
     * is not an instance of any class, and <tt>e.compareTo(null)</tt> should
25
     * throw a <tt>NullPointerException</tt> even though <tt>e.equals(null)</tt>
26
     * returns <tt>false</tt>.
27
28
     * It is strongly recommended (though not required) that natural orderings be
29
30
     * consistent with equals. This is so because sorted sets (and sorted maps)
     * without explicit comparators behave "strangely" when they are used with
31
32
     * elements (or keys) whose natural ordering is inconsistent with equals. In
       particular, such a sorted set (or sorted map) violates the general contract
33
     * for set (or map), which is defined in terms of the <tt>equals</tt>
34
35
     * method.
36
37
     * For example, if one adds two keys <tt>a</tt> and <tt>b</tt> such that
38
     * <tt>(!a.equals((Object)b) && a.compareTo((Object)b) == 0)</tt> to a sorted
       set that does not use an explicit comparator, the second <tt>add</tt>
39
     *
40
     *
       operation returns false (and the size of the sorted set does not increase)
41
     *
       because <tt>a</tt> and <tt>b</tt> are equivalent from the sorted set's
42
     *
       perspective.
43
44
     * Virtually all Java core classes that implement comparable have natural
45
       orderings that are consistent with equals. One exception is
46
       <tt>java.math.BigDecimal</tt>, whose natural ordering equates
       <tt>BigDecimal</tt> objects with equal values and different precisions
47
48
       (such as 4.0 and 4.00).
49
     * For the mathematically inclined, the <i>relation</i> that defines
50
51
     * the natural ordering on a given class C is:
52
             \{(x, y) \text{ such that } x. \text{ compareTo}((0bject)y) \& lt;= 0\}.
53
        The <i>quotient</i> for this total order is: 
54
     *
             \{(x, y) \text{ such that } x. \text{ compareTo}((\text{Object})y) == 0\}.
     * 
55
56
     * It follows immediately from the contract for <tt>compareTo</tt> that the
57
       quotient is an <i>equivalence relation</i> on <tt>C</tt>, and that the
58
       natural ordering is a <i>total order</i> on <tt>C</tt>. When we say that a
59
     * class's natural ordering is <i>consistent with equals</i>, we mean that the
60
     * quotient for the natural ordering is the equivalence relation defined by
61
     * the class's <tt>equals(Object)</tt> method:
62
63
           {(x, y) such that x.equals((Object)y)}.
     * 
64
65
     * This interface is a member of the
66
     * <a href="{@docRoot}/../guide/collections/index.html">
67
```

```
68
      * Java Collections Framework</a>.
69
70
      * @author Josh Bloch
      * @version 1.22, 12/19/03
71
72
      * @see java.util.Comparator
73
      * @see java.util.Collections#sort(java.util.List)
74
      * @see java.util.Arrays#sort(Object[])
75
      * @see java.util.SortedSet
      * @see java.util.SortedMap
76
77
      * @see java.util.TreeSet
      * @see java.util.TreeMap
78
      * @since 1.2
79
      */
80
81
82
     public interface Comparable<T> {
         /**
83
          * Compares this object with the specified object for order. Returns a
84
85
          * negative integer, zero, or a positive integer as this object is less
86
          * than, equal to, or greater than the specified object.
87
          * In the foregoing description, the notation
88
          * <tt>sgn(</tt><i>expression</i><tt>)</tt> designates the mathematical
89
          * <i>signum</i> function, which is defined to return one of <tt>-1</tt>,
90
          * <tt>0</tt>, or <tt>1</tt> according to whether the value of <i>expression</i>
91
          * is negative, zero or positive.
92
93
          * The implementor must ensure <tt>sgn(x.compareTo(y)) ==
94
          * -sgn(y.compareTo(x))</tt> for all <tt>x</tt> and <tt>y</tt>. (This
95
          * implies that <tt>x.compareTo(y)</tt> must throw an exception iff
96
97
          * <tt>y.compareTo(x)</tt> throws an exception.)
98
          * The implementor must also ensure that the relation is transitive:
99
          * <tt>(x.compareTo(y)&gt;0 &amp;&amp; y.compareTo(z)&gt;0)</tt> implies
100
          * <tt>x.compareTo(z)&gt;0</tt>.
101
102
          * Finally, the implementer must ensure that <tt>x.compareTo(y)==0</tt>
103
          *
            implies that <tt>sgn(x.compareTo(z)) == sgn(y.compareTo(z))</tt>, for
104
          *
            all <tt>z</tt>.
105
106
          * It is strongly recommended, but <i>not</i> strictly required that
107
          * <tt>(x.compareTo(y)==0) == (x.equals(y))</tt>. Generally speaking, any
108
          * class that implements the <tt>Comparable</tt> interface and violates
109
          \ast this condition should clearly indicate this fact. The recommended
110
111
          * language is "Note: this class has a natural ordering that is
          * inconsistent with equals."
112
113
          * @param
                      o the Object to be compared.
114
115
          * @return a negative integer, zero, or a positive integer as this object
116
                      is less than, equal to, or greater than the specified object.
117
118
          * @throws ClassCastException if the specified object's type prevents it
119
                    from being compared to this Object.
          */
120
121
         public int compareTo(T o);
     }
122
```