

```

1  package hyperDap.base.helpers;
2
3  /**
4   * An abstract helper class for frequently used number comparisons that exceed one
5   * line. Its purpose
6   * not only to simplify but rather to streamline programming and ensure comparisons
7   * in the project
8   * follow well defined standards.
9   *
10  * @author soenk
11  *
12  */
13
14  public final class Comparator {
15
16      private Comparator() {}
17
18      public static boolean equalProportionate(double a, double b, double
19      fractionalPrecision)
20      throws IllegalArgumentException {
21          if (fractionalPrecision < 0 || fractionalPrecision > 1) {
22              throw new IllegalArgumentException(
23                  String.format("%s.equalProportionate has been passed %s as precision!",
24                      Comparator.class,
25                      fractionalPrecision));
26          }
27          if (b < (a * (1 - fractionalPrecision))) {
28              return false;
29          }
30          if (b > (a * (1 + fractionalPrecision))) {
31              return false;
32          }
33          return true;
34      }
35
36      /**
37       * Evaluate whether with the chosen precision the two values are equal, i.e. if
38       * {@code a} plus or
39       * minus {@code precision} contains {@code b}.
40       *
41       * @param a
42       * @param b
43       * @param precision
44       * @return
45       */
46      public static boolean equalApprox(double a, double b, double precision) {
47          if (b < (a - precision)) {
48              return false;
49          }
50          if (b > (a + precision)) {
51              return false;
52          }
53          return true;
54      }
55
56      /**
57       * An encapsulation of {@link #equalApprox(double, double, double)} making use of
58       * {@link Number#doubleValue()}.
59       *
60       * @param a
61       * @param b
62       * @param precision
63       * @return
64       */
65      public static boolean equalApprox(Number a, Number b, Number precision) {
66          return Comparator.equalApprox(a.doubleValue(), b.doubleValue(),
67              precision.doubleValue());
68      }
69  }

```