

# Specifications: LabeledDouble

In addition to the obvious specifications illustrated in the UML class diagram, the LabeledDouble class must satisfy the following specifications.

1. LabeledDouble objects must be immutable.
2. If a constructor is passed a key that is null or empty (i.e., "") then the constructor must throw an IllegalArgumentException.
3. The LabeledDouble(String label) constructor must construct a LabeledDouble object with a value attribute of 0.0.
4. The compareTo(LabeledDouble other) method must return -1/0/1 if this.value is less than/equal to/greater than other.value with the following caveats:
  - 4.1. If this.value and other.value are both null then it must return 0.
  - 4.2. If this.value is null and other.value is not then it must return -1.
  - 4.3. If other.value is null and this.value is not then it must return 1.
5. The toString(boolean verbose) method must return a verbose or terse String representation of the LabeledDouble object.
  - 5.1. If verbose is true then:
    - 5.1.1. If the value attribute is null or NaN, then the returned String must contain the label attribute in a field width determined by the %s format string, followed by the String literal ":", followed by a single space, followed by the String literal "N/A" in a field width determined by the %s format string.
    - 5.1.2. Otherwise, the returned String must contain the label attribute in a field width determined by the %s format string, followed by the String literal ":", followed by a single space, followed by the value attribute in a field width determined by the %f format string.
  - 5.2. If verbose is false then:
    - 5.2.1. If the value attribute is null or NaN, then the returned String must contain the String literal "N/A" in a field width determined by the %s format string.
    - 5.2.2. Otherwise, the returned String must contain the value attribute in a field width determined by the %f format string.
6. The toString() method must return a terse String representation of the LabeledDouble object.

Note that, while null label attributes are invalid (i.e., every LabeledDouble object must have a non-null, non-empty label attribute), null value attributes are valid (and are used to indicate that the LabeledDouble is missing).