Software Engineering

**Assignment 2 - Report**



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7.

7.1.

* The purpose of using interface Comparable is to apply method compareTo() to classes of the Student type hierarchy, makes them *comparable* and then we can sort them in orders. Furthermore, in class Engine, we will declare objects as a TreeSet of Student, in order to do so, according to Java API, collection type TreeSet can only be applied for classes which already have implemented Comparable or Comparator.
* The purpose of using interface Document is to apply method toHtmlDoc() to classes of the Student type hierarchy, so that objects of this type hierarchy can generate a simple HTML document from the current state of itself.

(a) Yes. We can use interface Comparator instead of Comparable.

(b)

* We can create methods toHtmlDoc() manually in class Student then override them in subclasses.
* Under this case, both ways is equal in efficiency
* But we cannot manually creating methods in the case we have a main program that can only apply classes that “have the ability” to generate HTML Docs from Student hierarchy objects.

7.2.

TreeSet is a member of the Java Collections Framework. It will perform all element (which are Student objects) comparisons, using its compareTo() method. And it has a few useful properties:

* It keeps sorted data, maintain objects in sorted order, and provides us methods such as search, insert and delete, which are really beneficial for managing Student objects.
* Different from most other types of Set or Collection, TreeSet does not allow null Object and throw NullPointerException, make sense since we do not allow null Student objects.
* TreeSet does not allow duplicated elements, which is the same as we do not allow duplicated Student objects.
* If the TreeSet is accessed by multiple threads concurrently, and at least one of the thread modifies the set (such as addDoc()), it will be synchronized externally.

//Todo

7.3.

* Interface Document along with the method toHtmlDoc() is the key factor that makes it possible to search for Student objects using keywords.
* It generate somewhat of simple HTML Documents from the state of the Student objects, and use those document to search and return objects that matches.