Lab8

March 9, 2004

1   Goals

1.1   Familiarize students with

- Reading and writing Javadoc

- The proper way to write toString()

- The standard Vector and Collection classes

- Linear and binary search

- The Java Power Tools testing framework

1.2   Provided files

Lab8.zip[1], which includes

- Lab8.java[2]

- jpt.jar

- jpfalt.jar

2   Instructions

2.1   Getting started

Open Eclipse and create a new project, File → Import → Zip File → Next, select Lab8.zip, enter the destination folder and click Finish. If an overwrite dialog comes up, select 'Yes To All'.

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[1] http://www.ccs.neu.edu/ aubineth/Lab8.zip
[2] http://www.ccs.neu.edu/ aubineth/Lab8.java

2.2 Javadoc

Every object in Java has a toString() method. Look up the documentation of toString in the Sun Java API Specification[3].

Following the toString() method in Publisher, add a toString() method to the Book.

The Java community uses Javadoc as their standard method for documenting classes. Lookup the standard java Comparator interface and implement a class which compares the names of two authors. Add Javadoc comments with a purpose statement and with tags describing the parameters and return value. A how-to[4] and reference guide[5] is available online. Before running Javadoc on the computers in the lab or on your home machine, you must set the location of the Javadoc executable. Click through 'Window → Preferences → Java → Javadoc →' and then browse to 'C:\j2sdk1.4.2_01\bin\Javadoc'. Select 'Project → Generate Javadoc' to create the HTML from your comments.

2.3 Searching

Lookup the Vector class in the Sun Java API reference. What are the differences with between an array and a Vector? What interfaces does the Vector class implement?

In LinearSearcher, complete the contains() method. What methods from Vector are useful? Add two test methods to the Lab8 class which 1) search for a book present in the vector 2) search for a book not present in the vector. Use the expected() and actual() methods to check your results.

In BinarySearcher, complete the contains() method and its helper method searchIn. Add 3 methods to Lab8 to test 1) searching for a Book in the center of the vector 2) a Book in the left half of the vector and 3) a Book in the right half of the vector. Why would you want to use a binary search instead of a linear search? When can you use a binary search instead of a linear search?

3 Sorting

Lookup the Collection interface in the Sun Java API reference and implement the insertionSort method which takes a given collection and returns a Vector which is sorted in ascending order and its helper method insert. Add two test methods for both the insert and insertionSort method to the Lab8 class.

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[3]http://java.sun.com/j2se/1.4.2/docs/api/
[4]http://java.sun.com/j2se/javadoc/writingdoccomments/
[5]http://java.sun.com/j2se/1.4.2/docs/tooldocs/solaris/javadoc.html