Lab 7: Equality

Software provided:

- Interfaces ISelector, IComparer, IRange

- Classes that implement lists of objects.

- Classes that represent three different kinds of audio recordings; interfaces that describe two slightly different kinds of stacks; and two different implementations of each kind of stack.

File Lab7.java

The goals are

- Learn how to override the equals method that is defined in the Object class

- Learn how to implement an equals method that can compare two entirely different implementations of an abstract data type

- Learn how iterators make it easier to work with different implementations of an abstract data type

Details

- **Overriding the equals method**
  - Open the file Lab7.java.
  - Read the definitions of the ATune, MIDI, MP3, and WAV classes.
  - Add a public boolean equals (Object x) method to each of the MIDI, MP3, and WAV classes. Your methods will need to compare the bits arrays as well as the title and artist fields.

- **Comparing two different implementations**
  - Classes ListStack0 and ArrayStack0 both implement the IStack0 interface. Study their code.
- Two stacks are equal if they contain the same elements in the same order. This means that two instances of two different implementations of the IStack0 interface may be equal. Think about the problem of comparing an instance of one of these classes to an instance of the other.

- Hint: the equals method will need to cast its argument to a local variable of type IStack0, and use only the methods whose existence is guaranteed by the IStack0 interface. Since the state of that stack will be changed by the only methods that allow its entire state to be examined, the equals method will have to keep track of enough information to restore the original state of that stack at the end of the comparison.

- Add a public boolean equals (Object x) method to both the ListStack0 and the ArrayStack0 classes, making sure that an instance of one of these classes can compare itself to any object that implements the IStack0 interface.

**Using iterators to test for equality**

- Study the code for the equals method that appears within the AList class in AList.java.

- Back in Lab7.java, observe how the IStack interface extends the IStack0 interface by adding an iterator method, and how the ListStack and ArrayStack classes extend ListStack0 and ArrayStack0 by adding this method.

- Add a public boolean equals (Object x) method to both the ListStack and the ArrayStack classes, making sure that an instance of one of these classes can compare itself to any object that implements the IStack interface. (Hint: use iterators!)