

Exercise Set 1: Testing for Equality

Exercise 1.1 The given code contains the following class definitions:

- `ALibRec` an abstract class of library record
- `Book` a class representing one book
- `CD` a class representing one CD
- `Person` a class representing one person (book author or CD artist)
- `ALoLR` a list of library records
- `EmptyLoLR` empty list of library records
- `ConsLoLR` constructed list of library records
- `TestSuite` collection of sample objects and some tests

The purpose of this exercise is to learn techniques for testing of different forms of equality.

- Draw the UML diagram for this class hierarchy
- Implement `Comparable` interface for the classes `Book` and `CD`, comparing the items by the last name of either the author or the title. You must be able to compare a `CD` with a `Book`, etc.
- Design the methods `sort` and `insert` which together will sort the list of library records. The test suite is provided - just remove the comments.
- Object equality
 - Design the method `eq` which determines whether two library record variables represent the same instance of a library record object. Use a similar definition in the `class Person` as a model.
 - Design the method `equalContents` which determines whether two library objects contain the same information. Use a similar definition in the `class Person` as a model.
- Equality of collections of data.
 - Design the method `equalObjects` which determines whether the variables representing two lists of library records represent a collection of the same instances of library record objects.
 - Design the method `equalSortedObjects` which determines whether the variables representing two lists of library records represent a collection of the same instances of library record objects, appearing in the same order.

- Design the method `equalContents` which determines whether the two lists of library records contain records with the same contents.
 - Design the method `equalSortedContents` which determines whether the two lists of library records contain records with the same contents, appearing in the same order.
- In the TestSuite define a function `EqualArrayObjects` which consumes two arrays of library records and determines whether they contain the same objects. You may assume that both arrays are sorted.
- In the TestSuite define a function `EqualArrayContents` which consumes two arrays of library records and determines whether they contain the same number of elements with the same contents. You may assume that both arrays are sorted.