

## CSE1322L - Lab 5

### **Concept Summary:**

1. Object Oriented programming concepts
2. Abstract classes
3. Polymorphism

### **Objective:**

In this Lab you will need to create three classes and a driver program. The first class, the parent, should be an abstract class called Item. The other two classes, the children, should inherit from the parent class and be called Book and Periodicals. Finally, create a test class called myCollection.

Using IntelliJ/Visual Studio create a **UML diagram** for this Lab.

### **Item abstract class**

Create an abstract class called Item. It must have:

title - A private attribute of type string.

A getter/setter for title

A constructor that takes no arguments and sets title to empty string

A constructor which takes a title and sets the title attribute.

getListing() is an abstract method that returns a string and is implemented in classes Book and Periodicals.

An override of toString/ToString which returns the title.

### **Book child class**

Create a Book class which inherits from Item. It must have:

isbn\_number - A private attribute which holds an ISBN number (13 digits) to identify the book

author - A private attribute which holds the authors name (string)

getters/setters for the attributes in this class.

A constructor which takes no arguments

An overloaded constructor which sets all the attributes in the Book class as well as the Item class.

A concrete version of the getListing() method which should return a string that contains the following:

Book Name - Title  
Author - Author  
ISBN # - ISBN number

### **Periodical child class**

Create a Periodical class which inherits from Item. It must have:

issueNum - A private attribute which holds the issue number (e.g. 103)

getter/setter for issueNum

A constructor which takes no arguments

An overloaded constructor which sets all the attributes in the Periodical class as well as the Item class.

A concrete version of the getListing() method which should return a string that contains the following:

Periodical Title - Title

Issue # - Issue number

### **myCollection Driver Program**

Write the driver program which will prompt the user exactly 5 times to add Books and Periodicals to an array.

The array should be of type Item since it can hold either Books or Periodicals. This is polymorphism!

Ask the user to "Please enter B for Book or P for Periodical"

If they choose Book, prompt for Title, Author and ISBN number. Store the results in the next cell of the array.

If they choose Periodical, prompt for Title and IssueNumber. Store the result in the next cell of the array.

Once the user has entered 5 items which could be any combination of Books and Periodicals, show the user their collection.

See sample output below.

## **Sample Output:**

Please enter B for Book or P for Periodical

**B**

Please enter the name of the Book

**Lord of the Rings**

Please enter the author of the Book

**Tolkien**

Please enter the ISBN of the Book

**34**

Please enter B for Book or P for Periodical

**P**

Please enter the name of Periodical

**Times**

Please enter the issue number

**1234**

Please enter B for Book or P for Periodical

**B**

Please enter the name of the Book

**War and Peace**

Please enter the author of the Book

**Tolstoy**

Please enter the ISBN of the Book

**4567**

Please enter B for Book or P for Periodical

**B**

Please enter the name of the Book

**Alice in Wonderland**

Please enter the author of the Book

**Lewis Carroll**

Please enter the ISBN of the Book

**7890**

Please enter B for Book or P for Periodical

**P**

Please enter the name of Periodical

**New Yorker**

Please enter the issue number

**45**

Your Items:

Book Name - Lord of the Rings

Author - Tolkien

ISBN# - 34

Periodical Title - Times

Issue # - 1234

Book Name - War and Peace

Author - Tolstoy

ISBN# - 4567