# PA 303.10.3 - Practice Assignment - Polymorphism and Interface

## Lab Objective

After completing the hands-on practice assignment, you will be able to:

- Implement interfaces in your program.
- Apply polymorphism concept using the interface

### Requirements

**Scenario:** A library needs to develop an online application for two types of users/roles: adults and children. Both of these users should be able to register an account. Any user under **12 years** of age will be registered as a child, and they can borrow a "Kids" category book for 10 days, whereas an adult can borrow "Fiction" category books, which need to be returned within 7 days.

**Note:** In the future, more users/roles might be added to the library where similar rules will be enforced. Develop interfaces and classes for the categories mentioned above.

### Problem Statement 1:

1. Create an interface *LibraryUser* with the following methods declared,

| Method Name |
|---|
| registerAccount |
| requestBook |

2. Create 2 classes "*KidUser*" and "*AdultUser*" which implement the *LibraryUser* interface.

3. Both the classes should have two instance variables as specified below.

| Instance variables | Data type |
|---|---|
| age | int |
| bookType | String |

4. The methods in the *KidUser* class should perform the following logic.

    1. **registerAccount**: If age <= 11, a message displaying "You have successfully registered under a Kids Account" should be displayed in the console.

        If (age > 11), a message displaying, **"Sorry, age must be less than 12 to register as a kid."** should be displayed in the console.

    2. **requestBook**: If bookType is "**Kids,**" a message displaying "Book issued successfully, please return the book within 10 days" should be displayed in the console.

        Else, a message displaying, "**Oops, you are allowed to take only kids books.**" should be displayed in the console.

5. The methods in the *AdultUser* class should perform the following logic.

    1. **registerAccount** : If age >= 12, a message displaying "**You have successfully registered under an Adult Account.**" should be displayed in the console.

        If age <= 11, a message displaying, "**Sorry, age must be greater than 12 to register as an adult.**" should be displayed in the console.

    2. **requestBook** : If bookType is "**Fiction,**" a message displaying "**Book Issued successfully, please return the book within 7 days.**" should be displayed in the console.

        Else, a message displaying, "**Oops, you are allowed to take only adult Fiction books.**" should be displayed in the console.

6. Create a class "*LibraryInterfaceDemo.java*" with a **main()** method that performs the below functions,
**Test case #1:**

- Create an instance of the *KidUser* class.
- Set the age as specified in the below table and invoke the **registerAccount()** method of the KidUser object.

| Age |
|-----|
| 10 |
| 18 |

- Set the bookType as specified in the below table and invoke the **requestBook()** method of the KidUser object.

| BookType |
|----------|
| "Kids" |
| "Fiction" |

**Test case #2:**

- Create an instance of the **AdultUser** class.

- Set the age as specified in the below table and invoke the **registerAccount()** method of the AdultUser object.

| Age |
|-----|
| 5 |
| 23 |

- Set the bookType as specified in the below table and invoke the **requestBook()** method of the AdultUser object.

| BookType |
|----------|
| "Kids" |
| "Fiction" |

---

## Submission Instructions:

Include the following deliverables in your submission -

- Submit your source code using the Start Assignment button in the top-right corner of the assignment page in Canvas.

## CANVAS STAFF USE ONLY: Canvas Submission Guideline:

| Instructions for Canvas Assignment Creation |
|---|
| **Assignment Name:** PA 303.10.3 - Practice Assignment - Polymorphism and Interface <br><br> **Points:** 100 <br> **Assignment Group:** Module 303: Java SE Review (Not Graded) <br> **Display Grade As:** Complete/Incomplete <br> **Do not count this assignment towards the final grade:** Checked <br> **Submission Types:** File uploads <br> **Everything else is the default.** |