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1. 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 who is less than 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.

1. Create an interface LibraryUser with the following methods declared,
Method Name
registerAccount
requestBook

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

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

| | |
|----------|--------|
| age | int |
| bookType | String |

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

1. registerAccount : if age < 12, a message displaying "You have successfully registered under a Kids Account" should be displayed in the console.
If (age > 12), 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, "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 < 12, 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, "You are allowed to take only adult Fiction books" should be displayed in the console.

6. Create a class LibraryInterfaceDemo with a main method which performs the below functions,

In the main method, test all the methods.

CODING :

Main.java

```
import java.util.Scanner;

interface LibraryUser {
    void registerAccount();
    void requestBook();
}

class KidUser implements LibraryUser {
    int age;
    String bookType;

    public KidUser(int age, String bookType) {
        this.age = age;
        this.bookType = bookType;
    }

    @Override
    public void registerAccount() {
        if (age < 12) {
            System.out.println("You have successfully registered under a Kids Account");
        } else {
            System.out.println("Sorry, Age must be less than 12 to register as a kid");
        }
    }

    @Override
    public void requestBook() {
        if ("Kids".equalsIgnoreCase(bookType)) {
            System.out.println("Book Issued successfully, please return the book within 10 days");
        } else {
            System.out.println("You are allowed to take only kids books");
        }
    }
}
```

```

class AdultUser implements LibraryUser {
    int age;
    String bookType;

    public AdultUser(int age, String bookType) {
        this.age = age;
        this.bookType = bookType;
    }

    @Override
    public void registerAccount() {
        if (age > 12) {
            System.out.println("You have successfully registered under
an Adult Account");
        } else {
            System.out.println("Sorry, Age must be greater than 12 to
register as an adult");
        }
    }

    @Override
    public void requestBook() {
        if ("Fiction".equalsIgnoreCase(bookType)) {
            System.out.println("Book Issued successfully, please return
the book within 7 days");
        } else {
            System.out.println("You are allowed to take only adult
Fiction books");
        }
    }
}

public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        System.out.println("Enter age for KidUser:");
        int kidAge = scanner.nextInt();
        scanner.nextLine();

        System.out.println("Enter book type for KidUser:");
        String kidBookType = scanner.nextLine();

        KidUser kidUser = new KidUser(kidAge, kidBookType);
    }
}

```

```

        kidUser.registerAccount();
        kidUser.requestBook();

        System.out.println();

        System.out.println("Enter age for AdultUser:");
        int adultAge = scanner.nextInt();
        scanner.nextLine();
        System.out.println("Enter book type for AdultUser:");
        String adultBookType = scanner.nextLine();

        AdultUser adultUser = new AdultUser(adultAge, adultBookType);
        adultUser.registerAccount();
        adultUser.requestBook();

        scanner.close();
    }
}

```

OUTPUT:

```

Enter age for KidUser:
11
Enter book type for KidUser:
Kids
You have successfully registered under a Kids Account
Book Issued successfully, please return the book within 10 days

Enter age for AdultUser:
25
Enter book type for AdultUser:
Fiction
You have successfully registered under an Adult Account
Book Issued successfully, please return the book within 7 days
PS C:\Users\karnish.n\Desktop\Day 13\task 1> 

```

CODING:

Main.java:

```
import java.util.ArrayList;
import java.util.Collections;
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        ArrayList<Integer> list1 = new ArrayList<>();
        ArrayList<Integer> list2 = new ArrayList<>();

        System.out.println("Enter 5 integers for the first list:");
        for (int i = 0; i < 5; i++) {
            list1.add(scanner.nextInt());
        }

        System.out.println("Enter 5 integers for the second list:");
        for (int i = 0; i < 5; i++) {
            list2.add(scanner.nextInt());
        }

        ArrayList<Integer> mergedList = new ArrayList<>();
        mergedList.addAll(list1);
        mergedList.addAll(list2);

        Collections.sort(mergedList);

        ArrayList<Integer> resultList = new ArrayList<>();

        if (mergedList.size() > 2) resultList.add(mergedList.get(2));
        if (mergedList.size() > 6) resultList.add(mergedList.get(6));
        if (mergedList.size() > 8) resultList.add(mergedList.get(8));

        System.out.println("Final Result: " + resultList);

        scanner.close();
    }
}
```

OUTPUT:

```
Enter 5 integers for the first list:
5 2 9 1 7
Enter 5 integers for the second list:
6 3 8 4 0
Final Result: [2, 6, 8]
PS C:\Users\karnish.n\Desktop\Day 13\task 2> █
```

3. Read student details as input. The details would include name, mark in the given order. The datatype for name is string, mark is float. Create a hashmap that contains name as key and mark as value. Get student name as input and display the student grade.

1. If Mark is less than 60, then grade is FAIL.
2. If Mark is greater than or equal to 60, then grade is PASS.

CODING:

Main.java

```
import java.util.HashMap;
import java.util.Scanner;

public class StudentGrades {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        HashMap<String, Float> studentMap = new HashMap<>();

        System.out.print("Enter number of students: ");
        int n = scanner.nextInt();
        scanner.nextLine();

        for (int i = 0; i < n; i++) {
            System.out.print("Enter student name: ");
            String name = scanner.nextLine();

            System.out.print("Enter mark for " + name + ": ");
            float mark = scanner.nextFloat();
            scanner.nextLine();
            studentMap.put(name, mark);
        }
    }
}
```

```

    }

    System.out.print("Enter student name to check grade: ");
    String searchName = scanner.nextLine();

    if (studentMap.containsKey(searchName)) {
        float mark = studentMap.get(searchName);
        if (mark >= 60) {
            System.out.println(searchName + " - Grade: PASS");
        } else {
            System.out.println(searchName + " - Grade: FAIL");
        }
    } else {
        System.out.println("Student not found.");
    }

    scanner.close();
}
}

```

OUTPUT:

```

Enter number of students: 3
Enter student name: karnish
Enter mark for karnish: 80
Enter student name: bharani
Enter mark for bharani: 58
Enter student name: hemnath
Enter mark for hemnath: 90
Enter student name to check grade: bharani
bharani - Grade: FAIL

```

4. Write a program to get integers as input and store in the arraylist. Traverse the input list, if the number is even store in a arraylist called evenNumbersList and oddnumbers in oddNumberList. Print the input list and the lists containing even numbers and odd numbers.

CODING:

Main.java

```
import java.util.ArrayList;
import java.util.Scanner;

public class EvenOddSeparation {
    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        ArrayList<Integer> inputList = new ArrayList<>();
        ArrayList<Integer> evenNumbersList = new ArrayList<>();
        ArrayList<Integer> oddNumbersList = new ArrayList<>();

        System.out.print("Enter number of integers: ");
        int n = scanner.nextInt();

        System.out.println("Enter " + n + " integers:");
        for (int i = 0; i < n; i++) {
            int num = scanner.nextInt();
            inputList.add(num);

            if (num % 2 == 0) {
                evenNumbersList.add(num);
            } else {
                oddNumbersList.add(num);
            }
        }

        System.out.println("Input List: " + inputList);
        System.out.println("Even Numbers List: " + evenNumbersList);
        System.out.println("Odd Numbers List: " + oddNumbersList);
    }
}
```


OUTPUT:

```
, 11 ($?) { java EvenOddSeparation }  
Enter number of integers: 10  
Enter 10 integers:  
2 3 4 3 34 5 1 21 34 32  
Input List: [2, 3, 4, 3, 34, 5, 1, 21, 34, 32]  
Even Numbers List: [2, 4, 34, 34, 32]  
Odd Numbers List: [3, 3, 5, 1, 21]
```