Assignment5 of Xiaowei Liu

```
Start Input First Student UnderGraduate
please Enter Name:
XiaoweiLiu01
please Enter ID:
001
please Enter No.1 Exam Result:
40
please Enter No.2 Exam Result:
40
please Enter No.3 Exam Result:
41
Start Input Second Student PostGraduate
please Enter Name:
XiaoweiLiu02
please Enter ID:
002
please Enter No.1 Exam Result:
40
please Enter No.2 Exam Result:
40
please Enter No.3 Exam Result:
41
Start Input Third Student PostGraduate
please Enter Name:
XiaoweiLiu03
please Enter ID:
003
please Enter No.1 Exam Result:
50
please Enter No.2 Exam Result:
50
please Enter No.3 Exam Result:
51
name='XiaoweiLiu01, id=1, PASS
name='XiaoweiLiu02, id=2, NOT PASS
name='XiaoweiLiu03, id=3, PASS

Process finished with exit code 0
```

Main.java

```
import java.util.Arrays;
import java.util.Scanner;

public class Main {

    public static void main(String[] args) {
        // Create a new client object to manage student information
        client cLient = new client();

        // Input details for the first student (UnderGraduate)
        System.out.println("Start Input First Student UnderGraduate");
        cLient.array[0] = UserInputTemp(1);

        // Input details for the second and third students (PostGraduate)
        System.out.println("Start Input Second Student PostGraduate");
        cLient.array[1] = UserInputTemp(0);
        System.out.println("Start Input Third Student PostGraduate");
        cLient.array[2] = UserInputTemp(0);

        // Display the information and results for all students
        cLient.show();
    }

    // Function to take user input for a student (UnderGraduate or PostGraduate)
    public static Student UserInputTemp(int typeIndex) {
        Scanner scanner = new Scanner(System.in);

        // Input student details
        System.out.println("please Enter Name:");
        String name = scanner.nextLine();
        System.out.println("please Enter ID:");
        long id = scanner.nextLong();

        // Create a student object based on the type (UnderGraduate or PostGraduate)
        Student student = typeIndex == 1 ? new UnderGraduate(name, id) : new PostGraduate(name, id);

        // Input exam results for the student
        for (int i = 1; i <= 3; i++) {
            System.out.println("please Enter No." + i + " Exam Result:");
            int point = scanner.nextInt();
            student.setTestScore(i, point);
        }

        // Return the created student object
        return student;
    }
}

// Class to manage an array of students
class client {
    Student[] array = new Student[3];

    // Default constructor
```

```
    public client() {
    }

    // Function to display information and results for all students
    public void show() {
        for (Student student : array) {
            // Display student details
            System.out.print(student.toString() + ", ");

            // Calculate and display the result for each student
            student.calculateResult();
        }
    }
}
```

Student.java

```
import java.util.Arrays;

// A class representing a student
class Student {
    String name;
    long id;
    String grade;
    int[] test = {-1, -1, -1};

    int NUM_TESTS = 0;

    // Default constructor
    public Student() {
    }

    // Parameterized constructor to initialize name and id
    public Student(String name, long id) {
        this.name = name;
        this.id = id;
    }

    // Setter methods to set name, id, and grade
    public void setName(String name) {
        this.name = name;
    }

    public void setId(long id) {
        this.id = id;
    }

    public void setGrade(String grade) {
        this.grade = grade;
    }

    // Method to set test scores for a student
    public void setTestScore(int index, int score) {
```

```
        // Check if the index is within the valid range (1 to 3)
        if (index > 3) {
            System.out.println("Only take 3 exams");
        } else {
            // Update the number of tests taken and set the test score
            NUM_TESTS = test[index - 1] >= 0 ? NUM_TESTS : NUM_TESTS + 1;
            //make score valid
            test[index - 1] = score>=100?100:(score<=0?0:score);
        }
    }

    // Method to get the test score for a specific exam
    public int getTestScore(int index) {
        // Check if the index is within the valid range (1 to 3)
        if (index > 3) {
            System.out.println("Only take 3 exams");
        } else {
            // Return the test score for the specified exam
            return test[index - 1];
        }
        return -1; // Return -1 if the index is invalid
    }

    // Getter methods to retrieve name, id, grade, and the number of tests
    public String getName() {
        return name;
    }

    public long getId() {
        return id;
    }

    public String getGrade() {
        return grade;
    }

    public int getNUM_TESTS() {
        return NUM_TESTS;
    }

    // Method to display basic information about the student
    @Override
    public String toString() {
        return "name='" + name + ", id=" + id;
    }

    // Method to calculate and display the result for the student
    public void calculateResult() {
        // This method will be overridden by subclasses (UnderGraduate and PostGraduate)
    }
}

// A subclass representing an undergraduate student
class UnderGraduate extends Student {
    // Default constructor
    public UnderGraduate() {
```

```
    }

    // Parameterized constructor to initialize name and id
    public UnderGraduate(String name, long id) {
        super(name, id);
    }

    // Override the calculateResult method for undergraduates
    @Override
    public void calculateResult() {
        int sum = 0;
        // Calculate the sum of test scores
        for (int i = 0; i < NUM_TESTS; i++) {
            sum += test[i];
        }
        // Check if the average score is greater than or equal to 40
        if (sum / NUM_TESTS >= 40) {
            System.out.println("PASS");
        } else {
            System.out.println("NOT PASS");
        }
    }
}

// A subclass representing a postgraduate student
class PostGraduate extends Student {
    // Default constructor
    public PostGraduate() {
    }

    // Parameterized constructor to initialize name and id
    public PostGraduate(String name, long id) {
        super(name, id);
    }

    // Override the calculateResult method for postgraduates
    @Override
    public void calculateResult() {
        int sum = 0;
        // Calculate the sum of test scores
        for (int i = 0; i < NUM_TESTS; i++) {
            sum += test[i];
        }
        // Check if the average score is greater than or equal to 50
        if (sum / NUM_TESTS >= 50) {
            System.out.println("PASS");
        } else {
            System.out.println("NOT PASS");
        }
    }
}
```