

**Student Name: Tianle Shu**

**Student Id: 19232619**

**Lecturer Name: Seamus Hill**

## Question-1-a:

### Part-b:

#### Student Class

```
//Student Name: Tianle Shu
//Student Id: 19232619
//Lecturer: Seamus Hill
package nuig.Assignment6;
public class Student {

    private String name;
    private long id;
    private String grade;
    private int NUM_TESTS = 3;
    private int[] test = new int[NUM_TESTS];

    public Student() {
        name = "unassigned";
        id = 0000;
    }

    public Student(String name, long id) {
        this.name = name;
        this.id = id;
    }

    public void setName(String name) {
        this.name = name;
    }

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

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

    public void setTestScore(int num, int score) {
        this.test[num] = score;
    }
}
```

```

    }

    public int getTestScore(int score) {
        return test[score];
    }

    public int getNumTests() {
        return NUM_TESTS;
    }

    public String getName() {
        return name;
    }

    public long getID() {
        return id;
    }

    public String getGrade() {
        return grade;
    }

    @Override
    public String toString() {
        return "Student [name=" + name + ", id=" + id + ",
grade=" + grade + "]";
    }

    //calculateResult method
    public void calculateResult() {
        // declare int variable sum as all the test result
        int sum =0;
        //
        for(int i = 0 ; i < NUM_TESTS; i++) {
            sum += test[i];
        }
        float avg = sum/3;
        System.out.println(getName() + "'s the Average Result of
3 exams is " + avg);
    }
}

```

# UnderGraduate Class

```
//Student Name: Tianle Shu  
//Student Id: 19232619  
//Lecturer: Seamus Hill
```

```
package nuig.Assignment6;
```

```
public class UnderGraduate extends Student {
```

```
    public UnderGraduate() {  
        super();  
    }
```

```
    public UnderGraduate(String name, long id) {  
        // call the parents class(Student.class) setName and  
        setID methos to set name and id number  
        super.setName(name);  
        super.setID(id);  
    }
```

```
    public void calculateResult() {  
        // declare int variable sum as all the test result  
        int sum = 0;  
  
        for (int i = 0; i < getNumTests(); i++) {  
            int testScore = getTestScore(i);  
            sum = sum + testScore;  
        }  
        // average results of 3 test.  
        float average = (float) sum / (float) getNumTests();  
        // Undergraduate Students pass if the average mark of  
        their 3 exam results is  
        // greater than or equal to 40.  
        // grade >= 40 -> Grade = Pass; else Grade = Fail;  
        if (average >= 40) {  
            setGrade("Pass");  
        } else {  
            setGrade("Fail");  
        }  
        System.out.println("=====Graduate  
Student=====");  
    }
```

```

        // call the parents class(Student) calculateResult
        methos to output the average
        super.calculateResult();
    }
}

```

## PostGraduate Class

```

//Student Name: Tianle Shu
//Student Id: 19232619
//Lecturer: Seamus Hill

```

```

package nuig.Assignment6;

```

```

public class PostGraduate extends Student {

```

```

    public PostGraduate() {
        super();
    }

```

```

    public PostGraduate(String name, long id) {
        // call the parents class(Student.class) setName and
        setID methos to set name and id number
        super.setName(name);
        super.setID(id);
    }

```

```

    public void calculateResult() {
        // declare int variable sum as all the test result
        int sum = 0;

        // for-loop
        // for calculate sum for total 3 exam result
        for (int i = 0; i < getNumTests(); i++) {
            int testScore = getTestScore(i);
            sum = sum + testScore;
        } // end for loop

```

```

        // declare float variable average to caculate the
        average of 3 exam result
        float average = (float) sum / (float) getNumTests(); //
        average results of 3 test.

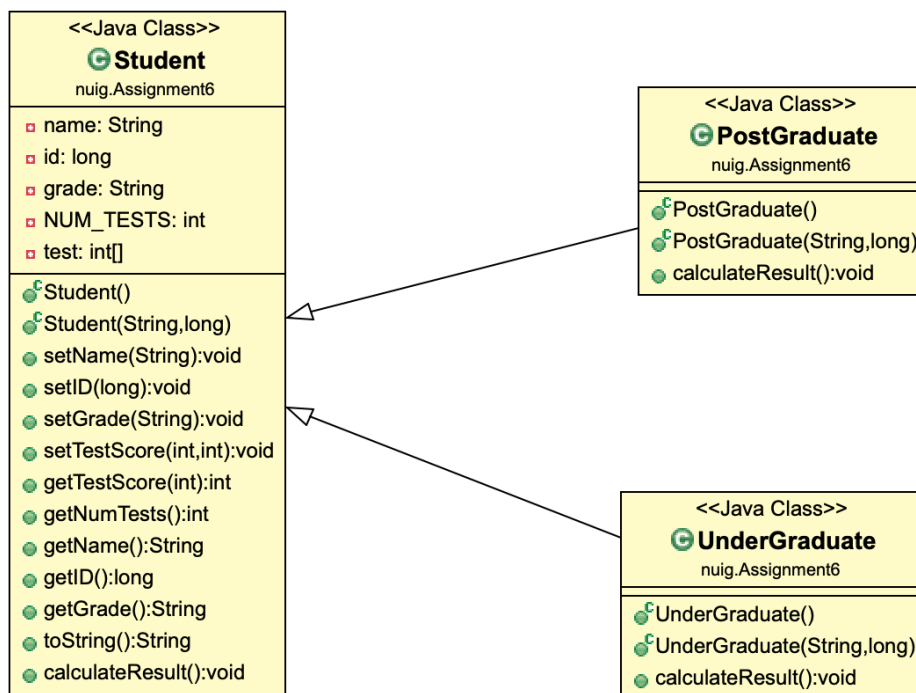
```

```

        // Postgraduate Students pass if the average mark of
their 3 exam results is
        // greater than or equal to 50.
        // grade >= 50 -> Grade = Pass; else Grade = Fail;
        if (average >= 50) {
            setGrade("Pass");
        } else {
            setGrade("Fail");
        }
        System.out.println("=====Graduate
Student=====");
        // call the parents class(Student) calculateResult
methos to output the average
        super.calculateResult();
    }//end calculateResult method
} //end class

```

\*student.ucls    Student.java    UnderGraduate.java    PostGraduate.java    Client.java



## Part-b:

### Client Class

```
//Student Name: Tianle Shu
//Student Id: 19232619
//Lecturer: Seamus Hill
package nuig.Assignment6;
import java.util.Scanner;

public class Client {
    @SuppressWarnings("resource")
    public static void main(String[] args) {
        // Scanner class, get user input, and it is found in the
        java.util package.
        Scanner input = new Scanner(System.in);

        // declare a students array. type for Student
        // and set the length is 3
        Student[] students = new Student[3];

        System.out.println("=====");
        System.out.println("I create an array of three
students");
        System.out.println("=====");
        // for loop
        // to get the student informations
        for (int i = 0; i < students.length; i++) {

            System.out.print(
                "Enter 1 for Undergraduate Student\nEnter 2
for Postgraduate Student\nPlease Choose the Number: ");
            // read the next int from the stream (entered from
            the keyboard) and store it in
            // a Int variable named stuType
            int stType = input.nextInt();
            input.nextLine();

            // if user input "1" then the student is
            UnderGraduate student
            if (stType == 1) {

                // tell user enter the student name.
```

```

        System.out.print("Enter Student Name: ");
        // get the student name from console
        String name = input.nextLine();

        // tell user enter the student id number.
        System.out.print("Enter Student ID Number: ");
        // get the student id number from console
        Long id = input.nextLong();

        // create undergraduate object
        students[i] = new UnderGraduate(name, id);
    }

    // if user input "2" then the student is PostGraduate
student
    else if (stType == 2) {

        // tell user enter the student name.
        System.out.print("Enter Student Name: ");
        // get the student name from console
        String name = input.nextLine();

        // tell user enter the student id number.
        System.out.print("Enter Student ID Number: ");
        // get the student id number from console
        Long id = input.nextLong();

        // create postgraduate object
        students[i] = new PostGraduate(name, id);
    }

    // this for loop
    // let user enter the 3 test score
    for (int j = 0; j < students[i].getNumTests(); j++) {

        // tell user enter the score and also show the
student name.
        System.out.print("Enter the " +
students[i].getName() + "'s exam result-" + (j + 1) + " of " +
":");

        // get the score from console and give the type is
int
        int score = input.nextInt();
        // if the score out of the range(0-100)

```



```

        if (score < 0 || score > 100) {
            // call the Score(j) method and get value if
the user enter correct score
            // and also give the return value(from the
Score(j) method) to score
            score = Score(j);
            // call the setTestScore(j,score)
            // "j" means which test
            // "score" , means the j's exam score
            students[i].setTestScore(j, score);
        } else {
            // call the setTestScore(j,score)
            // "j" means which test
            // "score" , means the j's exam score
            students[i].setTestScore(j, score);
        }
    } // end for loop
}

```

```

    // use for() loop iterating through an array(student)
and call calculateResult()
    // method each time
    // use toString() method to output student[i];
    for (int i = 0; i < students.length; i++) {
        students[i].calculateResult();
        System.out.println(students[i].toString() + "\n");
    } // end for loop

```

```

} // end main method

```

```

@SuppressWarnings("resource")
// create the Score method to compare if the single score
is belong to
// (range:0-100)
// And also have a attribute (j) to easy get which test
score is wrong.

```

```

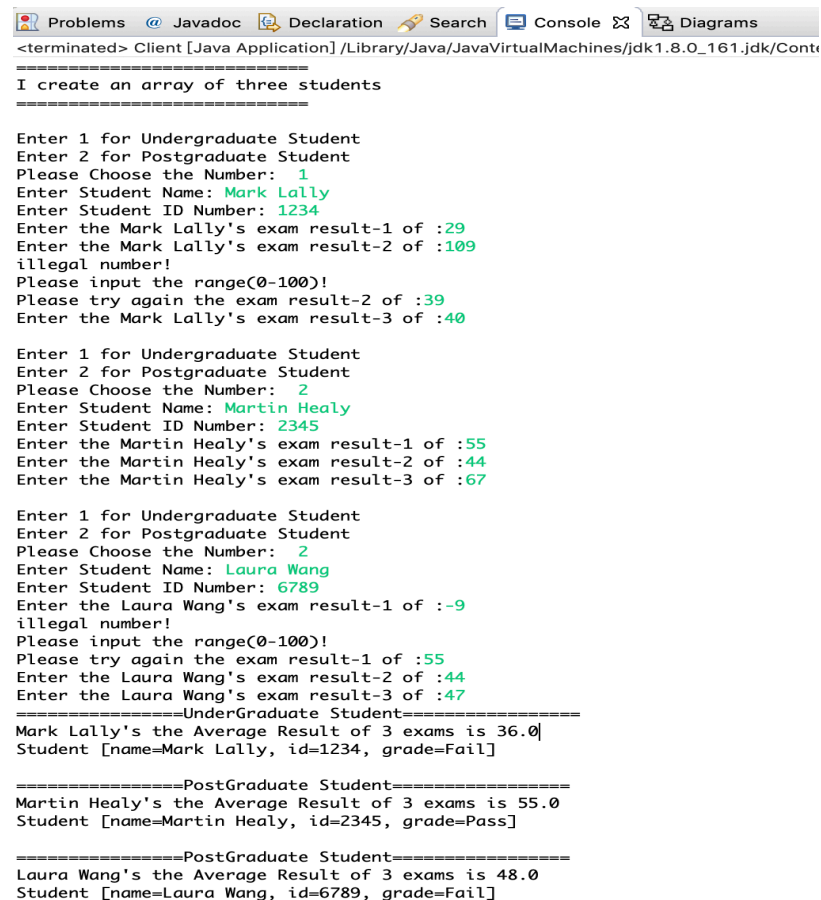
    private static int Score(int j) {
        // infinite loop to compare the score
        // if the score out of the range(0-100), it will let
people try again
        while (true) {
            // tell user try again because they enter the wrong
score
            // (out of the range 0-100)

```

```

        System.out.println("illegal number!\nPlease input the
range(0-100)!");
        // Scanner class, get user input, and it is found in
the java.util package.
        Scanner input = new Scanner(System.in);
        // tell people enter again and also tell them which
exam result is wrong
        System.out.print("Please try again the exam result-"
+ (j + 1) + " of " + ":");
        // get the score from console and give the type is
int
        int score = input.nextInt();
        // if the score in range(0-100)
        if (score > 0 && score < 100) {
            // return the score
            return score;
        }
    } // end while loop
} // end Score(j) method
} // end class

```



```

Problems @ Javadoc Declaration Search Console Diagrams
<terminated> Client [Java Application] /Library/Java/JavaVirtualMachines/jdk1.8.0_161.jdk/Cont
=====
I create an array of three students
=====

Enter 1 for Undergraduate Student
Enter 2 for Postgraduate Student
Please Choose the Number: 1
Enter Student Name: Mark Lally
Enter Student ID Number: 1234
Enter the Mark Lally's exam result-1 of :29
Enter the Mark Lally's exam result-2 of :109
illegal number!
Please input the range(0-100)!
Please try again the exam result-2 of :39
Enter the Mark Lally's exam result-3 of :40

Enter 1 for Undergraduate Student
Enter 2 for Postgraduate Student
Please Choose the Number: 2
Enter Student Name: Martin Healy
Enter Student ID Number: 2345
Enter the Martin Healy's exam result-1 of :55
Enter the Martin Healy's exam result-2 of :44
Enter the Martin Healy's exam result-3 of :67

Enter 1 for Undergraduate Student
Enter 2 for Postgraduate Student
Please Choose the Number: 2
Enter Student Name: Laura Wang
Enter Student ID Number: 6789
Enter the Laura Wang's exam result-1 of :-9
illegal number!
Please input the range(0-100)!
Please try again the exam result-1 of :55
Enter the Laura Wang's exam result-2 of :44
Enter the Laura Wang's exam result-3 of :47
=====UnderGraduate Student=====
Mark Lally's the Average Result of 3 exams is 36.0
Student [name=Mark Lally, id=1234, grade=Fail]

=====PostGraduate Student=====
Martin Healy's the Average Result of 3 exams is 55.0
Student [name=Martin Healy, id=2345, grade=Pass]

=====PostGraduate Student=====
Laura Wang's the Average Result of 3 exams is 48.0
Student [name=Laura Wang, id=6789, grade=Fail]

```