SE116 – LAB#6 2021-2022 SPRING

Aim: Sample class applications.

TO DO @ LAB:

1. Implement a program to simulate a sample Student Information System. Your project should contain the following three classes: `Student`, `Lecture` and `Test`.

The class `Student` will have the following `private` data members: `int ID`, `String fullName` and `double grade`. As always, please do not forget to implement appropriate set/get methods. Add non-parameterized and parameterized constructors. Moreover, implement a method to print out the information of a `Student` object.

The class `Lecture` will have the following `private` data members: `int lectureID`, `String lectureName` and `ArrayList<Student> studentList`. The data member `studentList` refers to an `ArrayList` that will store `Student` instances. The **"has-a" relationship** between the class `Lecture` and the class `Student` may be explained in the following manner: "An instance of class `Lecture` **has a** `studentList`". As always, please do not forget to implement appropriate set/get methods. Add non-parameterized and parameterized constructors. Moreover, implement a method to print out the information of a `Lecture` object.

The class `Test` will only contain the `main` method. In your `main`, use 2 lectures each with 5 students. You are free in your design to fill the information of the objects (i.e., you may either use constant data coded in the program or read data from the user). Then, for each lecture, print out the information of students passed (the criterion to pass: `grade>=60.0`).

2. Modify your project implemented in Question#**1** in the following manner:

Modify your class `Lecture` to add the following data member: `static int numberOfLectures`. The class member `numberOfLectures` will count the total number of lectures instantiated in the program. Do not forget to modify the constructors to be able to increment the corresponding number of lectures automatically when a new `lecture` object is instantiated. Also, add an appropriate get method to return the number of lectures.

Modify the method `main` of class `Test` in the following manner: Use a few lectures and assign some students to them. Meanwhile, print out the total number of lectures a few times in the program. Then, for each lecture, print out the information of students passed.

TO DO @ HOME:

3. Modify your project implemented in Question#**2** in the following manner:

Modify the method `main` of class `Test`. In `main`, use an `ArrayList<Lecture>` reference named as `lectureList`. Add new lectures with students into `lectureList`. Then, for each lecture in `lectureList`, print out the information of (1) the students who passed, (2) the student with the highest grade, (3) the student with the lowest grade. If there are duplicate grades for the students in the list, the first one found may be used as the result of the search algorithms. Finally, print out the average grade value of the students of each lecture.