This project is not a team project. Everyone must do his or her own programming.

Construct a Student class that matches the specifications below. Write the code for the constructor and for all of the methods. Do not change the names of any of the data fields, the method, or the modifiers, public or private.

```java
public class Student {
    private String lastName;
    private String firstName;
    private int studentID;
    private int units; // units taken
    private int gradePoints;

    public Student(String lname, String fname, int id, int uts, int gpts) {}

    public double gpa() {}

    public void addGrade(int u, char grade) {
        // Adds u to the units variable and adds the grade points corresponding to letter grade to gradePoints; prints an error message if u <= 0 or if grade is not an A, B, C, D, or F and in that case does not make the changes
    }

    public String toString() {
        return "Austen, Ann (1000) Units: 55 Grade Points: 56 GPA: 1.01";
    }

    // getters
    public String getLastName() {}
    public String getFirstName() {}
    public int getStudentID() {}
    public int getUnits() {}
    public int getGradePoints() {}
}
```

See next page for project details.
Lab Project 8 Details

1. Write a main program (Student.java) that tests all methods in your Student class and also tests the error checking capabilities of the addGrade method. **Label your output so that it is easy to see what you are testing.** Print the source code and output.

2. Place the Student.java program and the TestStudentClass.java program (see next page) in the same directory (not same file). Compile both and run the TestStudentClass.java program with several different random seeds. Check that everything works together properly. [Don't print anything out yet!]

3. Complete Part A and Part B on the instructor’s TestStudentClass.java. Compile and run the TestStudentClass.java with random seed = 12345678. Print the source code and output. If you do not get Part A or Part B to work, print out the output of Step 2 with seed = 12345678.

Hand in source code and output for Step 1 and Step 3 above.
Label all your work so that it can be read without having to hunt & pick & guess.
Projects that are not labeled, will not be graded.
import java.util.Random;

public class TestStudentClass
{
    public static void main( String[] args)
    {
        long seed = 12345678;
        Random random1 = new Random(seed);
        String[] firstnames = {"John", "Ann", "Betsy", "Ron", "David",
        String[] lastnames = {"Twain", "Hawthorne", "Austen", "Wordsworth",
        char[] lettergrades = {'A', 'B', 'C', 'D', 'F'};

        Student[] myStudents = new Student[8];

        System.out.println( "Creating Students Using Random Number Seed : " + seed);
        for( int k = 0; k < myStudents.length; k++)
        {
            int a = random1.nextInt(10);
            int b = random1.nextInt(10);
            int unitsEarned = random1.nextInt(100);
            int gradePointsEarned =
                (int)( unitsEarned* ( 1.0 + random1.nextDouble()*3.0 ));
            myStudents[k] = new Student(lastnames[a], firstnames[b], 1000+k,
                                         unitsEarned, gradePointsEarned);
            System.out.println(myStudents[k]);
        }

        System.out.println("\n\nAdding Grades");
        for(int k = 0; k < myStudents.length; k++)
        {
            int a = random1.nextInt(5);
            int b = 1 + random1.nextInt(4);
            myStudents[k].addGrade(b, lettergrades[a]);
            System.out.println("Added " + b + " units of " + lettergrades[a] + " to \" + myStudents[k]);
        }

        /* Part A Write code to find and print students in myStudents array
           with gpas >=3.0 . Label output */
        /*Part B Write code to find and print student in myStudents array
           with highest gpa . Label output */
    }
}