



**Computer Science Department/College of Engineering
and Computer Science**

CSc 020: Programming Concepts and Methodology II

Lab 5 (Spring 2018)

Objective:

In this lab, you will work with Object Oriented Programming (OOP) concepts. You are given with 3 Java class files. The first is the `CsusStudent` class with provided attributes and methods. The second class, `Csc20Student`, will be derived from the `CsusStudent`. The third is a class, `Lab5Tester`, which has a main method for testing of the first 2 classes.

Preparation: (at home)

Define a class named **Student**. A Student object represents a university student that, for simplicity, just has a name, ID number, and number of units earned towards graduation. Each Student object should have the following public behavior:

- `new Student(name, id)`
Constructor that initializes a new Student object storing the given name and ID number, with 0 units.
- `s.getName()`
`s.getID()`
`s.getUnits()`
Returns the name, ID, or unit count of the student, respectively.
- `s.incrementUnits(units);`
Adds the given number of units to this student's unit count.
- `s.hasEnoughUnits()`
Returns whether the student has enough units (180) to graduate.
- `s.toString()`
Returns the student's string representation, e.g. "Nick (#42342)".

Test your work with the following website:

<https://www.codestepbystep.com/problem/view/java/classes/Student>

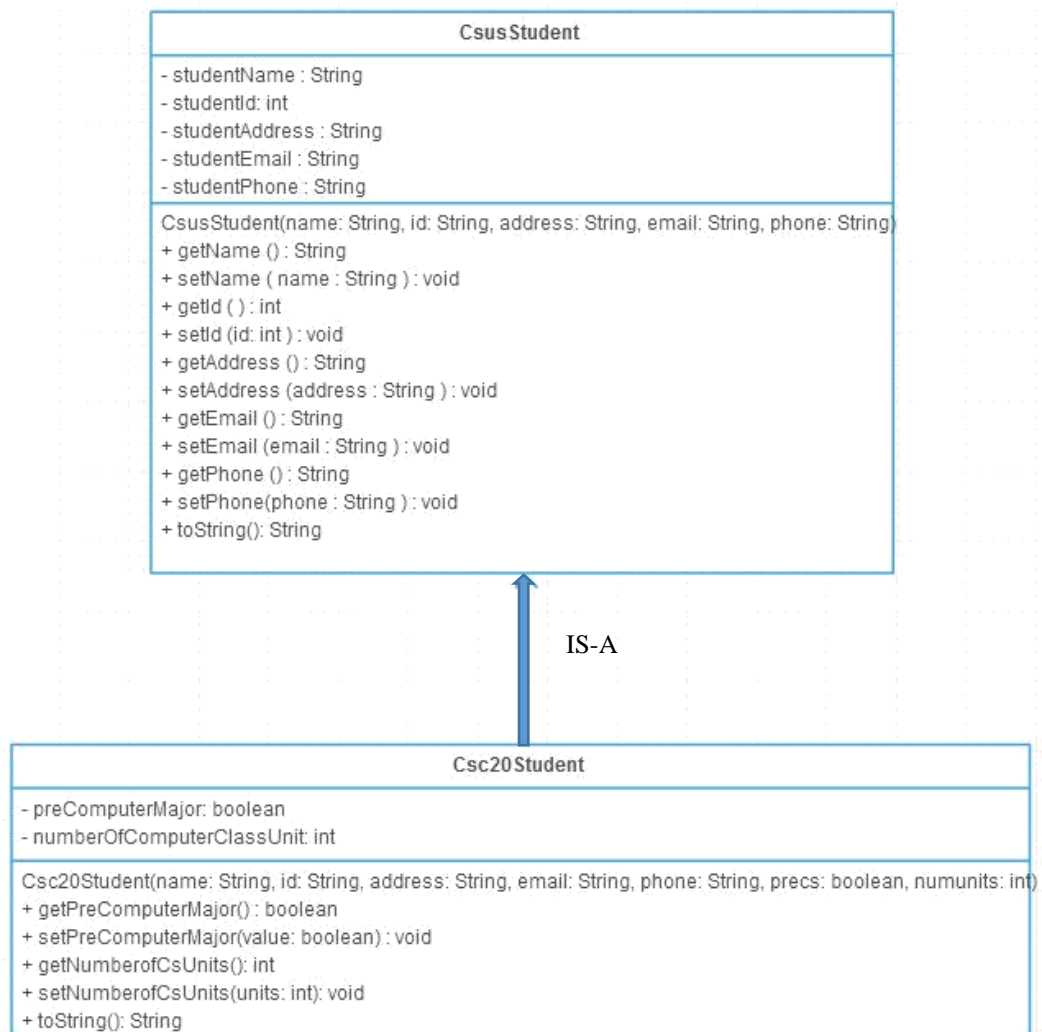
Lab work (in school laboratory):

This lab's objective is to practice building new classes:

- a. To define constructors.
- b. To define getter and setter methods.
- c. To build a new class from a super class.

We also will learn how to use **junit** to perform automatic unit testing.

The two classes CsusStudent and Csc20Student specification (in UML notation – to be discussed in the lecture) are given below:



Activities:

1. Copy instructor's classes from Canvas into your working directory.
2. Develop your program according the pseudo code given in these classes.
3. Test your program by running the main method in Lab5Tester.
4. Run a sample of your instructor's Junit test to validate your work.

Deliverables:

(1) Demonstrate your preparation work from the website <https://www.codestepbystep.com/problem/view/java/classes/Student> to your instructor.

(2) Please demonstrate your CsusStudent.java, Csc20Student.java, Lab5Tester.java programs to the instructor and obtained a signed off work.

(3) Please answer the following question:

From the Lab5Tester, when the following lines of code are executed, name the methods (of your program) are invoked?

```
System.out.println(student + "\n");  
System.out.println(csc20Student + "\n");
```

What would be the expected result if the named methods are not available?

(4) Turn in your java programs, answer to question (3), and output file (including Junit test result) in PDF format to Canvas.

Note on installing Junit:

1. Add a **new folder** to your CSc 20 Jcrasp directory (where you stored your previous lab assignments). Named **junit**.
2. Download junit (from <https://sourceforge.net/projects/junit/files/junit/4.10/>) and save the **junit-4.10.jar Basic jar** file into this new **junit** folder
 1. A jar file is a Java Archive file containing multiple Java files in one zipped file. You do **not** need to extract the individual files.
 2. Add the junit jar file to your jGRASP:
 - In jGRASP, Click the Tools -> Junit -> Configure
 3. Browse to your **junit directory**, click OK

Note: You only need to set up **jUnit** one time.