**CSC 1302: PRINCIPLES OF COMPUTER SCIENCE II**

**Lab 5**

**How to Submit**

Please submit your answers to the lab instructor once you have completed.

Failure to submit will result in a **ZERO FOR THIS LAB. NO EXCEPTIONS**.

The class diagram with four classes **Student**, **Graduate**, **Undergraduate**, and **Exchange** is given. Write the classes as described in the class diagram. The fields and methods for each class is given below.

**Student**

**Exchange**

**Graduate**

**Undergraduate**

***Student***:

Fields: major (String)

gpa (double)

creditHours (int)

Methods:

getGpa: returns gpa

getYear: returns “freshman”, “sophomore”, “junior” or “senior” as determined by earned credit hours:

* Freshman: Less than 32 credit hours
* Sophomore: At least 32 credit hours but less than 64 credit hours
* Junior: At least credit hours 64 but less than 96 credit hours
* Senior: At least 96 credit hours

***Graduate***:

Fields: degree (String) (“Masters” or “PhD”)

concentration (String)

years (int) (stores no. of years spent in grad school)

Methods:

getYear: returns years (this is an integer, not like the student…)

getConcentration: returns concentration (ex: Data Science, NeuroScience, Bioinformatics, Cybersecurity, etc.)

***Undergraduate***:

Fields: honors (Boolean)

Methods:

isHonors: returns honors (TRUE or FALSE)

***Exchange***:

Fields: country (String)

year(string) (start date of the exchange program, stores Fall, Spring or Summer followed by the year e.g., Fall 2020)

Methods:

getYear: returns year

getCountry: returns country

* Write a client class, called ***StudentClient***.
* Create an object of class ***Undergraduate*** called Alex whose major is CS, gpa is 3.9, credit hours = 54, and honors = TRUE.
* Create an object of class ***Graduate*** called Mary whose degree is “Masters”, years = 1, gpa is 3.91, major = “Computer Science” and concentration is “Data Science”.
* Print out Alex’s major, gpa, year, and use isHonors method to see if the he is an honors student.
* Print out Mary’s major, concentration, and years spent in graduate school.
* Create an object of class ***Exchange*** called YingShu, for an exchange student with Fall 2020, from Tiawan, and print out their gpa, major, and country.

hint: you can override *toString()* to print things and combine with parent classes.