CS 101 Algorithms & Programming I - Fall 2021 - Section 1 Quiz 3 - **Week of November 29, 2021**

Design and implement a couple of classes for representing *students* and *departments* that the students are in. Here, a student should have a unique ID (starts with 1 and gets automatically used and incremented during construction), a name (specified during construction but may change over time) and a department (a reference to a department object; must be determined during instantiation and not allowed to change). A department should have a name (e.g., "Computer Engineering") and a two-letter code (e.g., "CS") both determined during construction (and not allowed to change afterwards) and a count of students (all time, regardless of students' graduation status) that gets incremented with each new instance of the student class whose department is this one. In addition, implement

- a `getDeptName()` method for the student class that returns the name of student's department
- a `toString()` method for the department class so that when invoked on a CS department with 2 students, it returns a string of the following format:
  "`Computer Engineering Department (CS) has 2 students`!".

Make sure you pay attention to the principle of information hiding but due to limited space, do not worry as much about style and checking of any invalid values being specified.

```
public class Student {
  private static int count = 0;
  private int ID;
  private String name;
  private Dept dept;
  public Student(String aName, Dept aDept) {
    this.ID = ++Student.count;
    this.name = aName;
    this.dept = aDept;
    aDept.addStudent();
  }
  public int getID() { return this.ID; } // no set method
  public String getName() { return this.name; }
  public void setName(String aName) { this.name = aName; }
  public Dept getDept() { return this.dept; } // no set method
  public String getDeptName() { return this.dept.getName(); }
}
```

```
public class Dept {
  private int count = 0;
  private String name;
  private String code;
  public Dept(String aName, String aCode) {
    this.name = aName;
    this.code = aCode;
  }
  public String getName() { return this.name; } // no set method
  public String getCode() { return this.code; } // no set method
  public int getNoOfStudents() { return this.count; } // no set method
  public void addStudent() { this.count++; }
  public String toString() {
    return this.name + " Department (" + this.code +
      ") has " + this.count + " students!";
  }
}
```

Name: _____ ID: _____ Signature: _____