CPS 181 - Chapter 1 Assignment: Model the World in Java

The goal of this assignment is to help you see how everything in the world can be thought of as an object or a class. You will design your own classes in Java and practice using constructors, methods, setters/getters, static fields, and ArrayLists.

# Instructions

Pick a real-life object (e.g., Student, Dog, Car, PizzaOrder). Follow each part below to gradually build your class. Remember:   
- Nouns (things it has) become fields (variables).  
- Verbs (things it can do) become methods.

## Part 1: Classes & Objects

Define a class with at least 2 fields and 1 method.

Example:

class Student {  
 String name;  
 int id;  
  
 void study() {  
 System.out.println(name + " is studying.");  
 }  
}  
  
Student s1 = new Student();

## Part 2: Constructors

Add a constructor to your class that sets the fields when you create an object.

Example:

public Student(String n, int i) {  
 name = n;  
 id = i;  
}

## Part 3: Constructor Overloading

Add a second constructor with a different parameter list to give another way of creating your object.

Example:

public Student(String n) {  
 name = n;  
 id = -1;  
}

## Part 4: Mutators (Setters) & Accessors (Getters)

Add at least one setter and one getter to your class.

Example:

public void setName(String n) {  
 name = n;  
}  
  
public int getId() {  
 return id;  
}

## Part 5: Static Fields

Add a static field to track how many objects have been created. Update it in the constructor.

Example:

static int totalStudents = 0;  
  
public Student(String n, int i) {  
 name = n;  
 id = i;  
 totalStudents++;  
}

## Part 6: ArrayList of Objects

In your main method, create an ArrayList of your class and add at least 3 objects to it.

Example:

ArrayList<Student> students = new ArrayList<>();  
students.add(new Student("Alice", 1));  
students.add(new Student("Bob", 2));  
students.add(new Student("Charlie", 3));

## Optional Challenge: Inheritance

Create a subclass that extends your class and adds one new field or method.

Example:

class GraduateStudent extends Student {  
 String thesisTitle;  
  
 public GraduateStudent(String n, int i, String t) {  
 super(n, i);  
 thesisTitle = t;  
 }  
}

Deliverable: Submit your Java file(s) with all parts completed. Be ready to explain how your class models a real-world object.