SECTION 9 PRACTICE

```
import java.util.ArrayList;
import java.util.Scanner;

class Dorm {
    private String name;
    private int population;
    private double x, y;

    public Dorm(String name, double x, double y, int population) {
        this.name = name;
        this.population = population;
        this.x = x;
        this.y = y;
    }

    public double getX() {
        return x;
    }

    public double getY() {
        return y;
    }
```

```
    public int getPopulation() {
        return population;
    }

    public void setPopulation(int population) {
        this.population = population;
    }

    public void setLocation(double x, double y) {
        this.x = x;
        this.y = y;
    }

    public String getName() {
        return name;
    }
}

class Student {
    private Dorm dorm;

    public Student(Dorm dorm) {
        this.dorm = dorm;
    }

    public double getX() {
```

```
        return dorm.getX();
    }

    public double getY() {
        return dorm.getY();
    }
}

public class CampusMap {
    private static ArrayList<Dorm> dorms = new ArrayList<>();
    private static ArrayList<Student> studyGroup = new ArrayList<>();

    public static void main(String[] args) {
        Scanner scanner = new Scanner(System.in);

        // Adding dorms
        dorms.add(new Dorm("Dorm A", 100, 200, 100));
        dorms.add(new Dorm("Dorm B", 500, 300, 150));
        dorms.add(new Dorm("Dorm C", 300, 500, 200));

        // Adding students to the study group
        studyGroup.add(new Student(dorms.get(0)));
        studyGroup.add(new Student(dorms.get(1)));
        studyGroup.add(new Student(dorms.get(2)));

        while (true) {
            System.out.println("Current Dorm Populations:");
```

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        for (Dorm dorm : dorms) {
            System.out.println(dorm.getName() + ": " + dorm.getPopulation());
        }

        System.out.println("Enter dorm name to update population (or 'exit' to finish):");
        String dormName = scanner.nextLine();
        if (dormName.equals("exit")) break;

        System.out.println("Enter new population:");
        int newPopulation = Integer.parseInt(scanner.nextLine());

        for (Dorm dorm : dorms) {
            if (dorm.getName().equals(dormName)) {
                dorm.setPopulation(newPopulation);
            }
        }

        updateCenters();
    }

    scanner.close();
}

private static void updateCenters() {
    double allX = 0, allY = 0, totalPopulation = 0;
    for (Dorm dorm : dorms) {
        allX += dorm.getX() * dorm.getPopulation();
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            allY += dorm.getY() * dorm.getPopulation();
            totalPopulation += dorm.getPopulation();
        }
        double centerX = allX / totalPopulation;
        double centerY = allY / totalPopulation;

        System.out.println(String.format("Center of All Students: (%.2f, %.2f)", centerX, centerY));

        // Update the study group center
        double studyX = 0, studyY = 0;
        for (Student student : studyGroup) {
            studyX += student.getX();
            studyY += student.getY();
        }
        double studyCenterX = studyX / studyGroup.size();
        double studyCenterY = studyY / studyGroup.size();

        System.out.println(String.format("Center of Study Group: (%.2f, %.2f)", studyCenterX,
studyCenterY));
    }
}
```