CS164: Abstract Class and Interface Worksheet
Name(s):____

1. Consider the abstract class Teacher presented below to implement what is being asked in FullTimeTeacher and PartTimeTeacher classes.

```
public abstract class Teacher {
    private static int idGenerator = 1;
    private int id;
    private String subject;
    private int totalHoursWeek;
    public Teacher(){
        this("", 0);
    }
    public Teacher(String subject, int hours){
        setSubject(subject);
        setTotalHoursWeek(hours);
        id = idGenerator;
        idGenerator++;
    }
    public void setSubject(String subject){
        this.subject = subject;
    }
    public String getSubject(){
        return subject;
    }
    public void setTotalHoursWeek(int hours){
        totalHoursWeek = hours;
    }
    public int getTotalHoursWeek(){
        return totalHoursWeek;
    }
    public abstract double getSalary();

    public String toString(){
        return String.format("ID: %d Subject: %s Total Hours of Week: %d", id, 
subject, totalHoursWeek);
    }
}

public class PartTimeTeacher extends Teacher{
    private double hourSalary;
    public PartTimeTeacher(){
        this("",0, 0);
    }
    public PartTimeTeacher(String subject, int hours, double hourSalary){
        //implements this constructor


    }
    public void setHourSalary(double value){
        hourSalary = value;
    }
    public double getHourSalary() {
        return hourSalary;
    }
    public double getSalary(){
        //implement this method


    }
    public String toString(){
        return super.toString() + "Hours salary: " + hourSalary;
    }
}
```

```
public class FullTimeTeacher extends Teacher {
    private double salary;
    public FullTimeTeacher(){
        this("", 0, 0);
    }
    public FullTimeTeacher(String subject, int hours, double salary){
        //implements this method


    }
    public void setSalary(double salary){
        this.salary = salary;
    }
    public double getSalary(){
        //implements this method
    }
    public String toString(){
        return super.toString() + "Salary: " + salary;
    }
}
```

2. Analyze the classes below and implement what is being asked.

```
import java.io.File;
import java.io.FileNotFoundException;
import java.util.ArrayList;
import java.util.Collections;
import java.util.Scanner;
public class ListCountry {
    ArrayList<Country> countries = new ArrayList<Country>();

    public void readCountries(String filename) {
        try {
            Scanner scnr = new Scanner(new File(filename));
            while (scnr.hasNextLine()) {
                String name = scnr.next();
                double area = scnr.nextInt();
                countries.add(new Country(name, area));
            }
        } catch (FileNotFoundException e) {
            e.printStackTrace();
        }
    }

    public void sortList(String check) {
        if(check.equals("name"))
            Country.compareData = true;
        else Country.compareData = false;
        Collections.sort(countries);
    }
    public String toString() {
        StringBuilder s = new StringBuilder();
        for(Country c : countries) {
            s.append(c);
            s.append('\n');
        }
        return s.toString();
    }
    public static void main(String args[]){
        ListCountry listCountry = new ListCountry();
        listCountry.readCountries("countries.txt");
        listCountry.sortList("name");
        System.out.println(listCountry);
        listCountry.sortList("area");
        System.out.println(listCountry);
    }
}

public class Country implements Comparable<Country> {
    private String name;
    private double area;
    public static boolean compareData;

    public Country(String name, double area) {
        this.name = name;
        this.area = area;
    }

    public double getArea() {
        return area;
    }

    public String getName() {
        return name;
    }

    @Override
    /**
     * if compareData is true - compare Country by names
     * if compareData is false - compare Country by area
     */
    public int compareTo(Country o) {
        //implement this method



    }

    @Override
    public boolean equals(Object obj) {
        if(this == obj) return true;
        //finalize the implementation of this method





    }

    public String toString() {
        return "name: " + name + " area: " + area;
    }
}
```

Assume that countries.txt has this content:

```
Brazil 3288000
USA 3797000
Portugal 35603
India 1269000
```