

# CPSC 131: Introduction to Computer Programming II

## Program 2: Country Class

### 1 Description of the Program

In this assignment, you will need to design and implement a class `Country` (`Country.java`) that stores the name of the country, its population, and its area. Then write a program (`LargestCountry.java`) that reads countries from a “`countrydata.txt`” and prints

- The country with the largest area.
- The country with the largest population.
- The country with the largest population density (people per square mile).

To make it concrete, the followings are the suggested tasks you need to perform:

#### 1.1 Country Class

In the first file `Country.java`, create a class named `Country` that models a country. It should contain at least the followings (However, you can add any other methods if you like):

- Private instance variables `name`, `population`, and `area`;
- A constructor takes all three inputs (the `name`, `population` and `area`);
- Three `getter` methods to return each of three instance variables (`accessor method`);
- One `getter` method to return country population density (`accessor method`);
- Three `setter` methods to change each of three instance variables (`mutator`);
- A method `printCountry` that prints out the country information.

## 1.2 LargestCountry Class

In the second file `LargestCountry.java`, you are required to write methods for reading country data, and finding required information. The followings are suggested methods that you need to implement:

- Method 1: `readCountry`

```
/**
 * Reads a country in from a file.
 * @return all countries in an arraylist
 */
public static ArrayList<Country> readCountry(String fileName)
    throws FileNotFoundException
{
    // your work here
}
```

- Method 2: `countryWithLargestArea`

```
/** @return the country with the largest area
 */
public static Country countryWithLargestArea(
    ArrayList<Country> countries)
{
    // your work
}
```

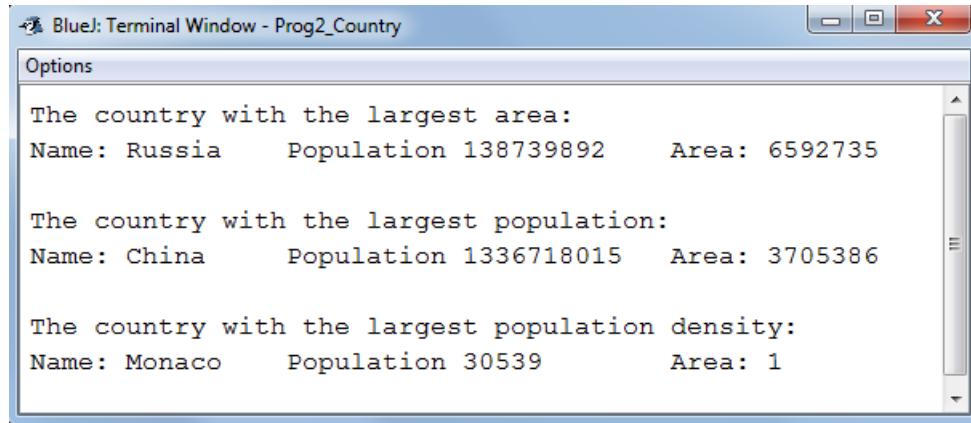
- Method 3: `countryWithLargestPopulation`

```
/** @return the country with the largest population */
public static Country countryWithLargestPopulation(
    ArrayList<Country> countries)
{
    // your work
}
```

- Method 4: `countryWithLargestPopulationDensity`

```
/** @return the country with the largest population density
 */
public static Country countryWithLargestPopulationDensity(
    ArrayList<Country> countries)
{
    // your work
}
```

In your `main()` method in `LargestCountry.java`, you will use the methods you have implemented to do the following: (1) Read the “`countrydata.txt`” in; (2) Print out your findings (See a sample output in Figure 1).



```
BlueJ: Terminal Window - Prog2_Country
Options
The country with the largest area:
Name: Russia      Population 138739892    Area: 6592735

The country with the largest population:
Name: China       Population 1336718015    Area: 3705386

The country with the largest population density:
Name: Monaco      Population 30539         Area: 1
```

Figure 1: A sample program output

## 2 Additional requirements

1. Your program output should be neat (See Figure 1).
2. Your program should have good style (indentation, whitespace, comments, vertical alignment, ...).

## 3 Submission

Upload the following items on D2L dropbox, including:

1. The source code (`Country.java` and `LargestCountry.java`).
2. Screenshot of your program output (Similar to sample output shown in Figure 1).