

Do you use any libraries? What libraries are used in your application?

```
import java.util.ArrayList;
import java.util.Collections;
import java.util.HashMap;
import java.util.Iterator;
import java.util.List;

import processing.core.PApplet;
import processing.core.PFont;
import processing.core.PImage;
import processing.core.PVector;
import processing.data.Table;

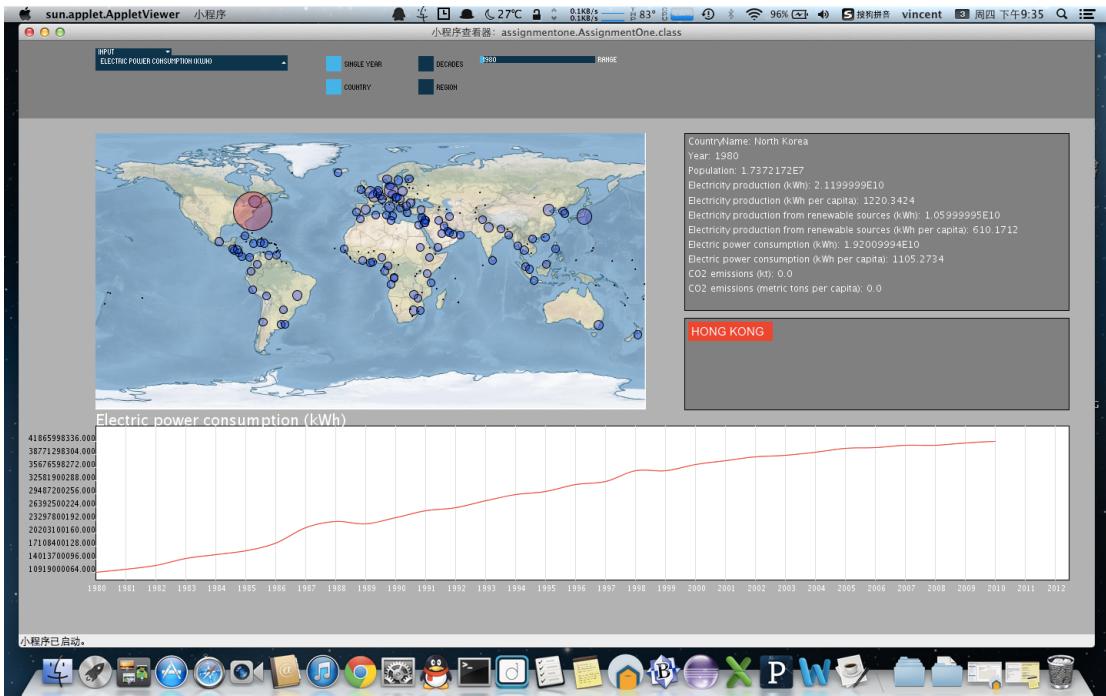
import controlP5.Button;
import controlP5.CheckBox;
import controlP5.ControlEvent;
import controlP5.ControlP5;
import controlP5.DropDownList;
import controlP5.Group;
import controlP5.RadioButtons;
import controlP5.Slider;
```

**Using Java List and Map to process and memory Data.**

**Using processing core to show Data.**

**Using controlP5 to put control.**

b. How to use your application and the things you can do with it?



This is the first view of the application. You can see three parts in it.

### Part One.



In this part, you can choose the Data source and some options.

Include the following data source,

- Electricity production (kWh)
- Electricity production from renewable sources (kWh)
- Electric power consumption (kWh)
- Electric power consumption (kWh per capita)
- CO2 emissions (metric tons per capita)
- CO2 emissions (kt)
- Population, total

Group data into the following regions:

- East Asia & Pacific
- Europe & Central Asia
- Latin America & Caribbean
- Middle East & North Africa
- North America
- South Asia
- Sub-Saharan Africa

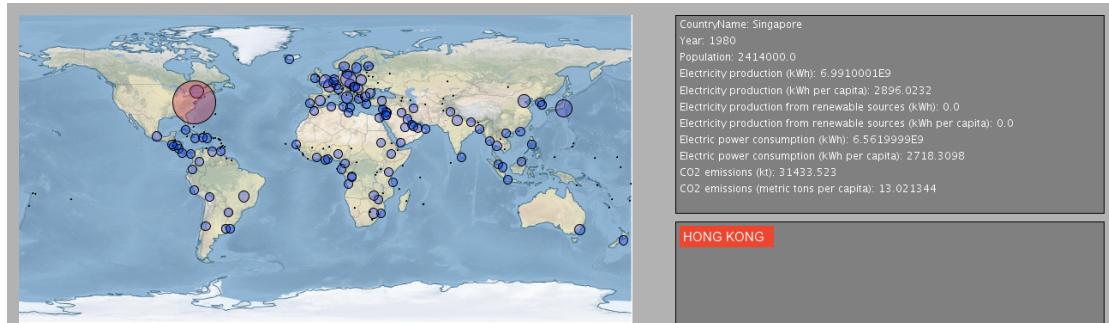
Or you can count data to decades as follow.



And you also can slide the right slider to choose the particular year.

Especially, when you click the “decades”, the year will only show 4 values (1980, 1990, 2000, 2010).

## Part Two.



In this part, you can see the world map on the left and some circles shows on it.

1. I used the location of the capital of country to show circle.
2. The larger the circle is, the value will be bigger, and I also use the color from red to blue to show the data from high to low.
3. Using a simple and direct method compare all countries value.

When you move the mouse over some circle, the textbox on the right will be reproduced in term of the country which your mouse over.

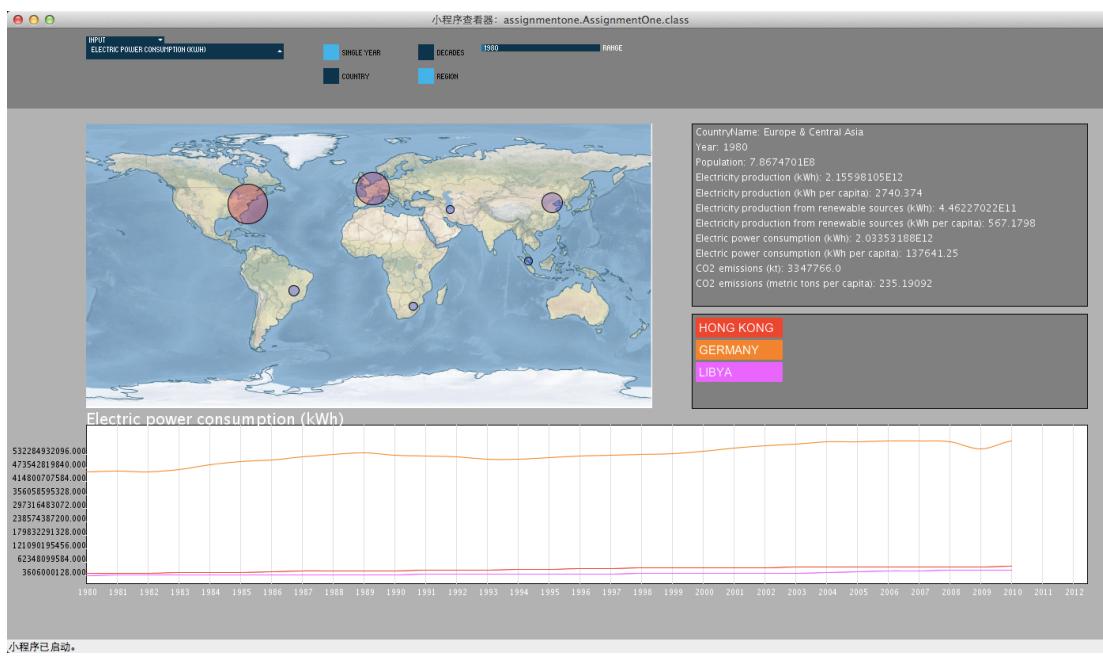
This text is jointed following indicators (both absolute terms and per capital terms):

Country Name  
Year  
Population  
Electricity production (kWh)  
Electricity production (kWh per capita)  
Electricity production from renewable sources (kWh): "  
Electricity production from renewable sources (kWh per capita)  
Electric power consumption (kWh):  
Electric power consumption (kWh per capita)  
CO2 emissions (kt)  
CO2 emissions (metric tons per capita)

When you click another input options in the part one, the world map will also change.

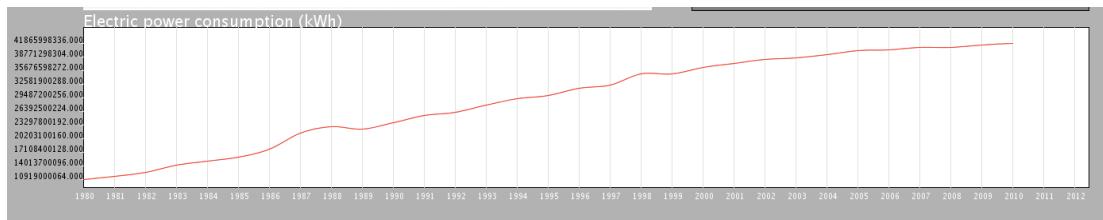
For example,

When you check from “country” to “region”, the world map will change as following picture.



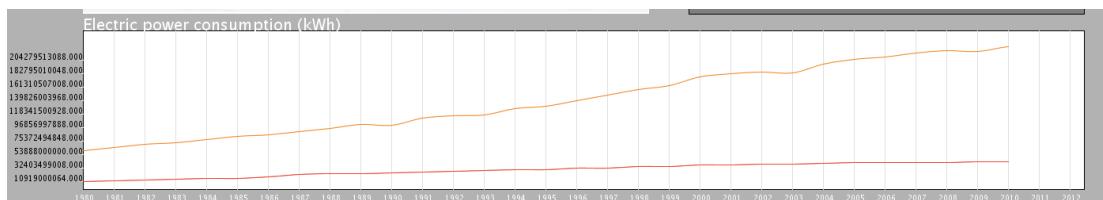
I chose one city of each region to locate their regions.

### Part three



In this part, the chart shows trends in the seven data sources.

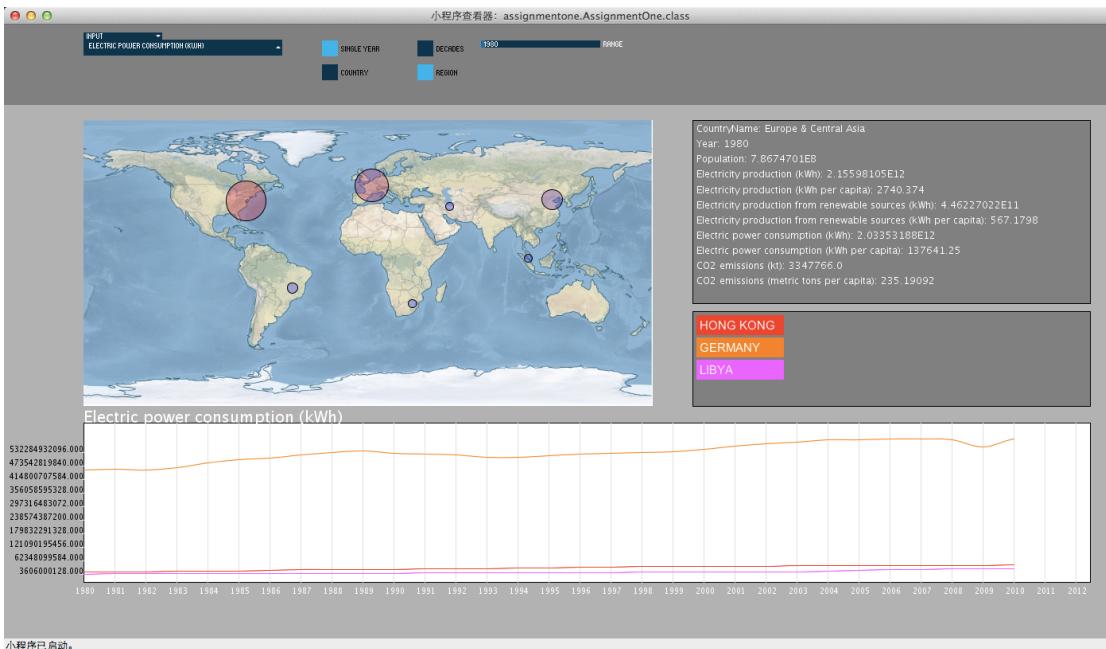
And when you click the circle (not only move over), the country will be added into the chart and we will compare data in this method.



At same time, there will be showed the color of the country in the lower right of part two. You can distinguish different country through the color easily.



Certainly, when the input changes, the chart will change.



### TIPS:

**The key of 'l' and 'J' can used to adjust the indicator of "year".**

**The key of UP and DOWN can used to adjust the indicator of "data source".**

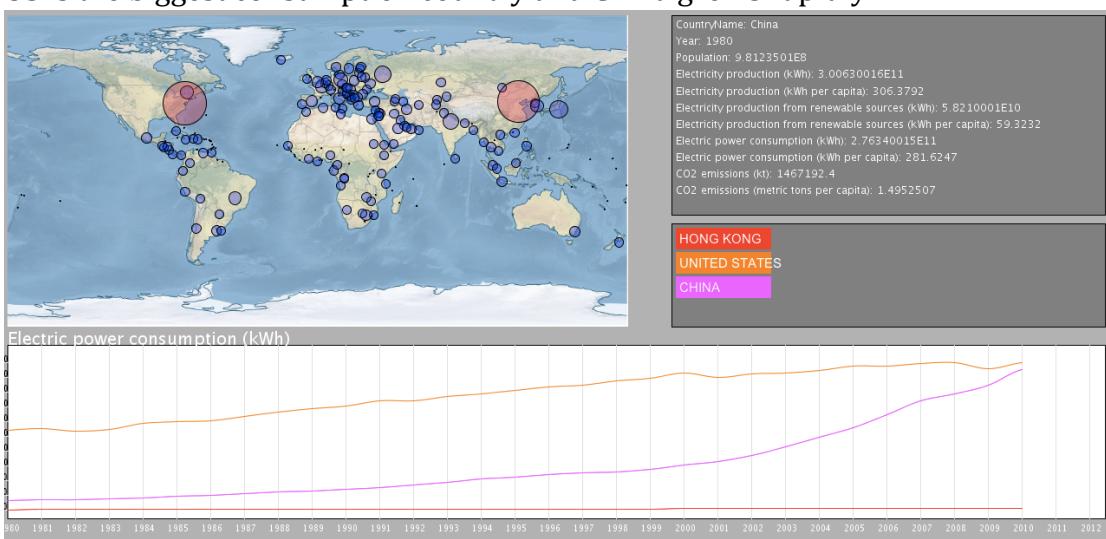
**When you press the key, the showing data will change.**

**Specially, when you remain press the 'J', the circle on the map will be bigger continuously, if there is increasing data.**

c. What interesting things you found using your application?

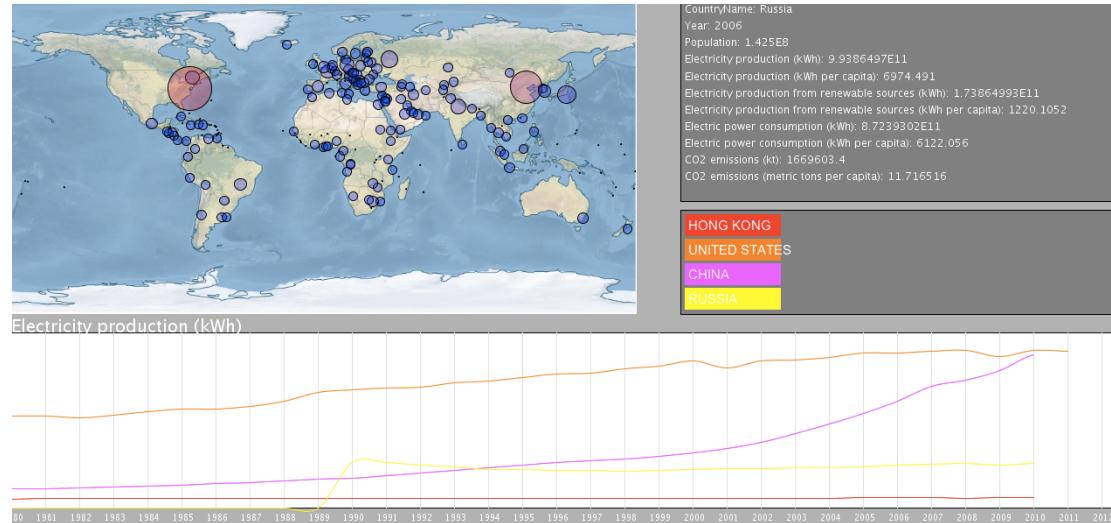
Electric power consumption:

US is the biggest consumption country and China grows rapidly.



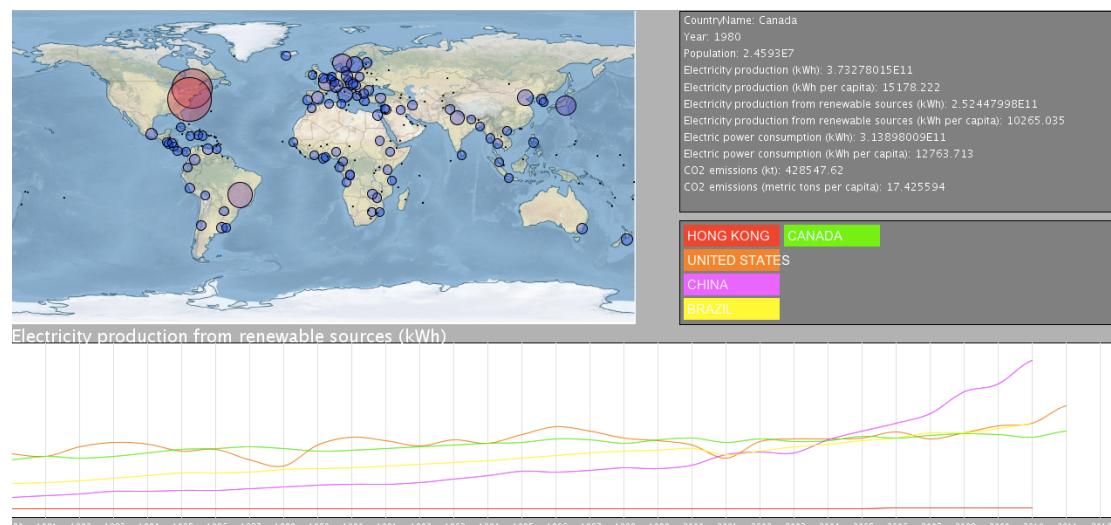
## Electricity production:

US produced most electricity and China grows rapidly, while Russia fell back since 1980s. Actually, its all index fell down except population.



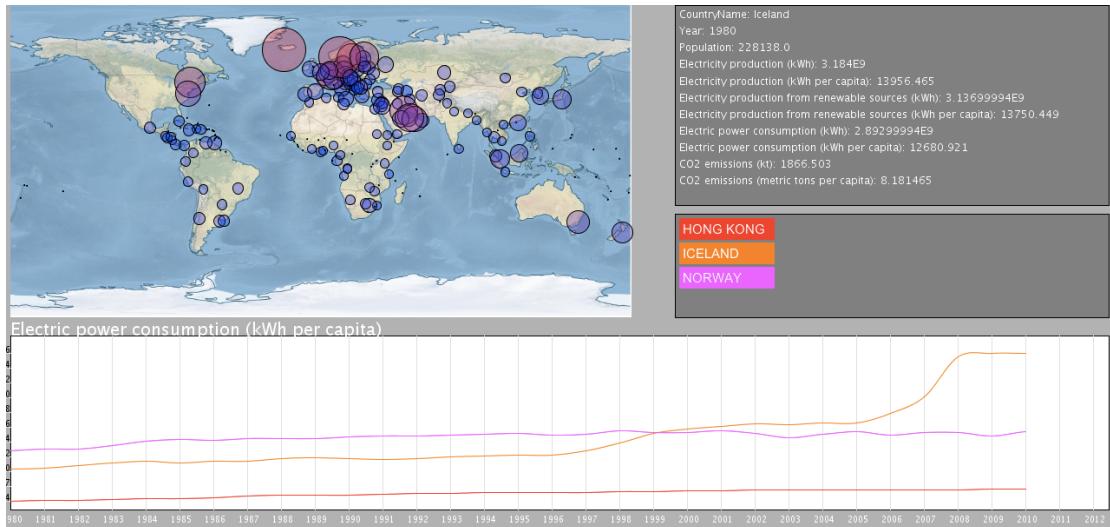
## Electricity production from renewable sources:

US and Canada produced most electricity from renewable sources and China became the leader since 2004.

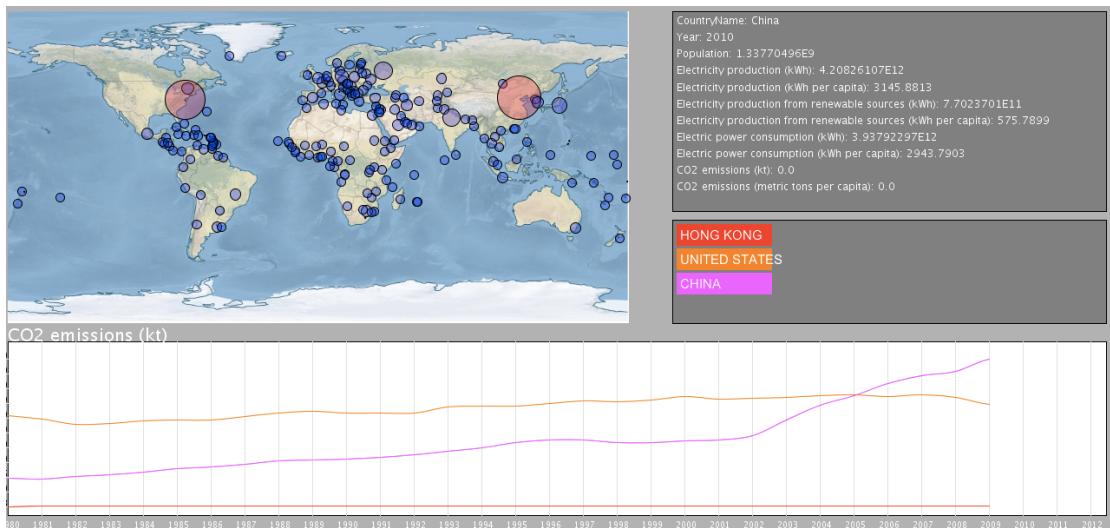


## Electric power consumption (kWh per capita):

Iceland surpassed Norway in 1999.

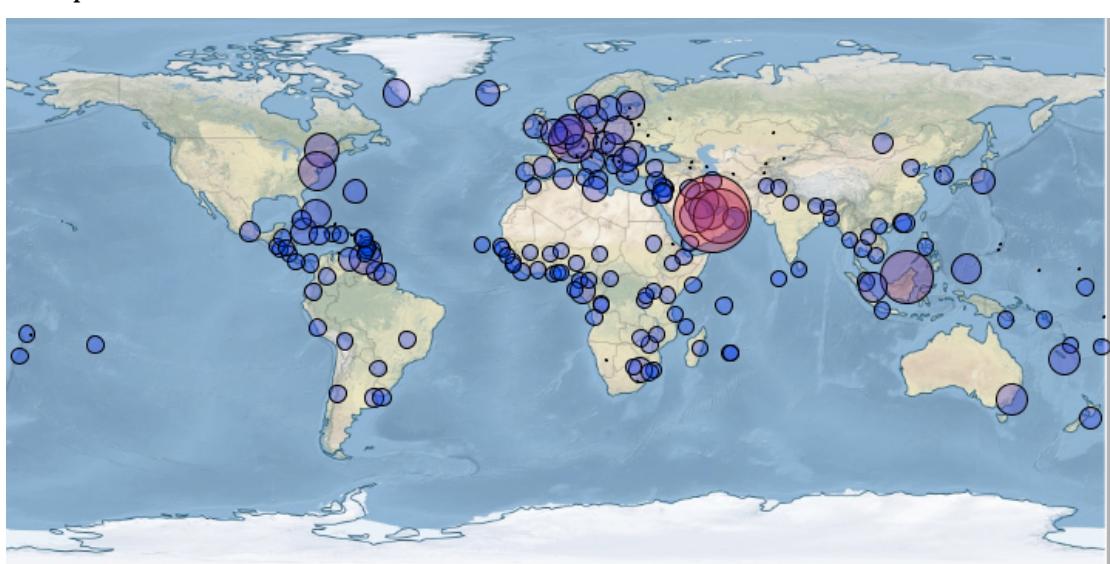


### CO2 emissions (kt): US and China!

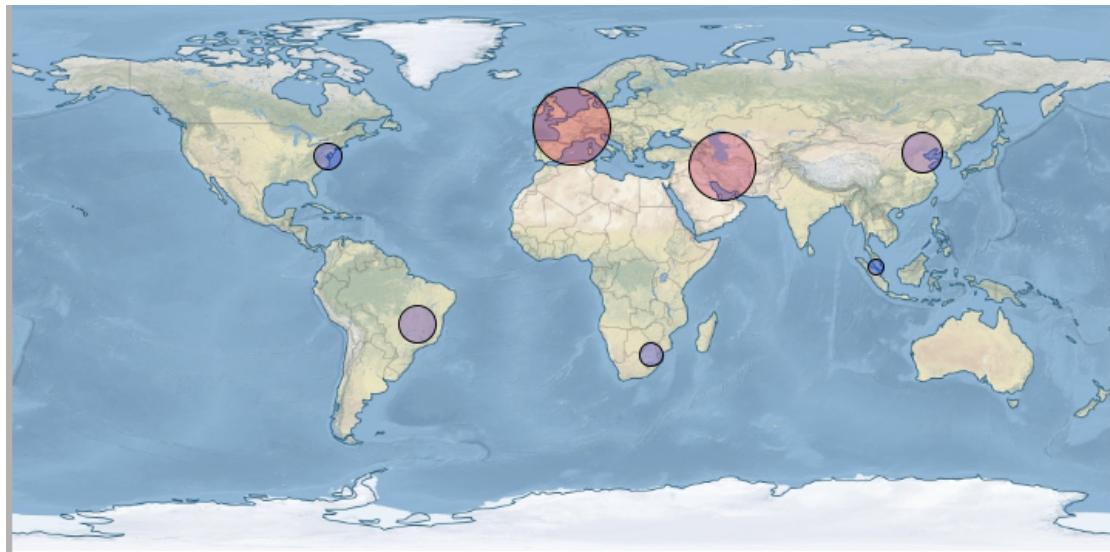


### CO2 emissions (metric tons per capita):

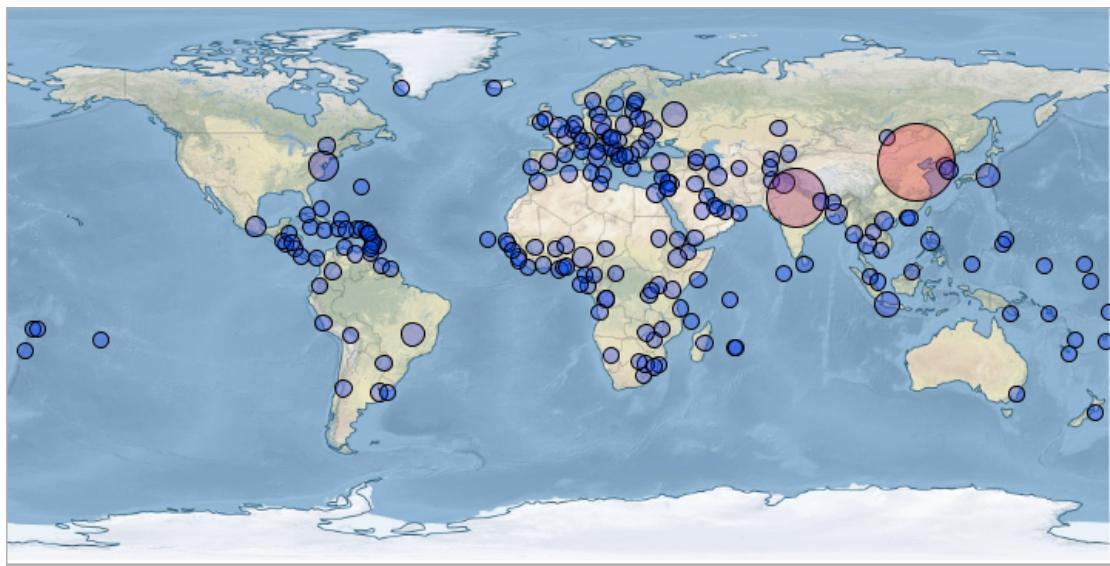
Europe and Middle East!



The view of regions:



Population, total:  
No surprise, China and India.



d. More functions and bugs?

#### 1. More countries on the map.

I had intended using the SVG file to location the world map but I couldn't find the SVG file that contain the information of country.

So I decided to use the checkbox to show the different country name as the input. But I still can't find a proper checkbox that contains scrolling in term of about 200 countries.

In the end, I had to put all countries data on the map. The data is in a mess.

And I had coded the checkbox of regions, but I finally decided to cut this function in term of what I mention above.



#### 2. Global variable

I use a global variable "countryName" to store the temp data, which means when mouse leave the circle, the variable still store the country name and I click it wherever, application will add this name of country to the part three.

#### 3.I can't clear the part three.

This is a big problem. When user wants to re-compare the data, the line has been painted. How to remove that? There must be a solution?

#### 4.High CPU index

I found the CPU index remained at 70% level, its too high. So I refactored program and it is still not work. Maybe I used too many iterators.

I also noticed that the Processing use the polling way to draw. I think it's bad solution, if I have so much data to process when in interaction.