EECS 428 / ECE 578
DATA VISUALIZATION
Spring 2016

ASSIGNMENT 4

Due Date: *Friday, May 27th, 2016, 23:59*
(16 Points)

Assignment Submission: *Turn in your assignment by the due date through LMS. Prepare and upload* ***one zip file****. Name the zip file as <your first name>_<your last name>_ assignment4. See the question for what you should return.*

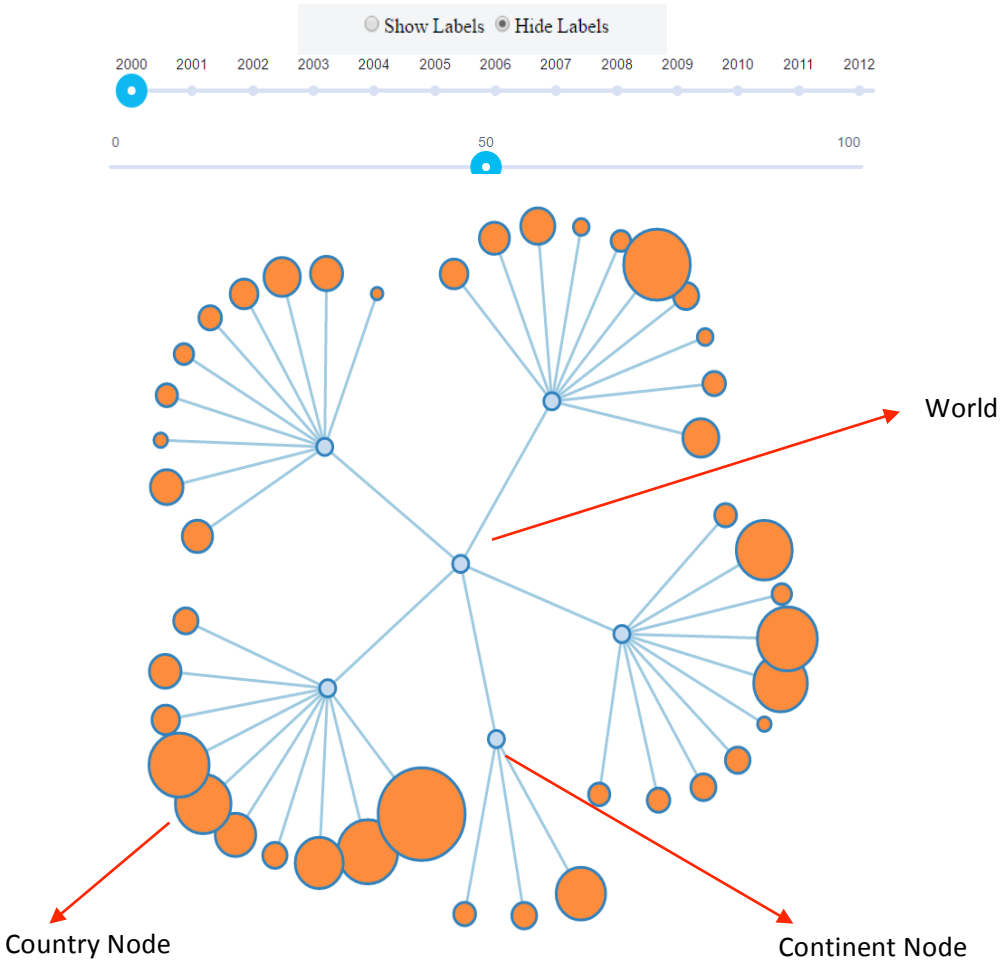
You can discuss JavaScript, D3 and questions with each other. ***However, implementation must be your own; you must neither copy from nor provide assistance to anybody else (including online resources). If you need guidance for any question, talk to the instructor or TA.***

In this assignment, you will use the data of 192 countries that you also used in the previous assignments (*countries.json*). As you remember, the file contains information about the population, GDP, life expectancy, and many other aspects of various countries from 1995 to 2012. You will plot the population information from 2000 to 2012 in a hierarchical representation in this assignment and you will enable exploration of the data through various interactive features that you will develop.

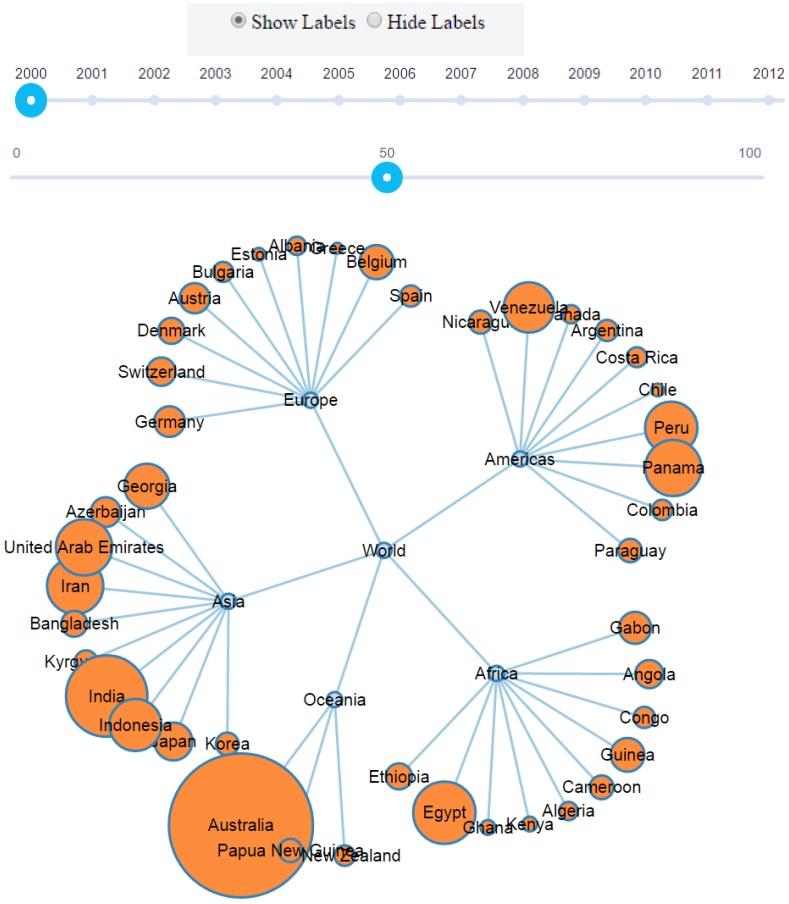
The main visual will be a hierarchical (organized as a tree) collapsible force directed graph. The node at the center of this graph (the root of the tree) represents ***world***. The next level of nodes represents ***continents***. Next and final level (leaf nodes) represents ***countries***. A country node is connected to the corresponding continent node (i.e., the leaf node that represents Germany is connected to the node that represents Europe). The root node (World) should be at a fixed location at the center of graph (user should be able to drag it around to another location if he/she wants to). The rest of the nodes should float around and settle to some locations through a force directed simulation. However, graph should have clearly visible hierarchical structure as you can see in the examples in the figures. Any node can be dragged and it re-starts the force directed simulation. Nodes represent world and continents are same

color and size. However, the size of leaf nodes (countries) should be proportional to the population of the corresponding country (Use a proper scale). Also use a color (for leaf nodes) that is different than world and continents.

Provide a ***slider bar to select a year*** from 2000 to 2012. Based on the selected year, the population information and subsequently the size of the country nodes should be updated.



Provide an option to show/hide a label for each node to specify the country/continent name or World as you can see in the next figure. Use a ***radio button to show/hide the labels***.



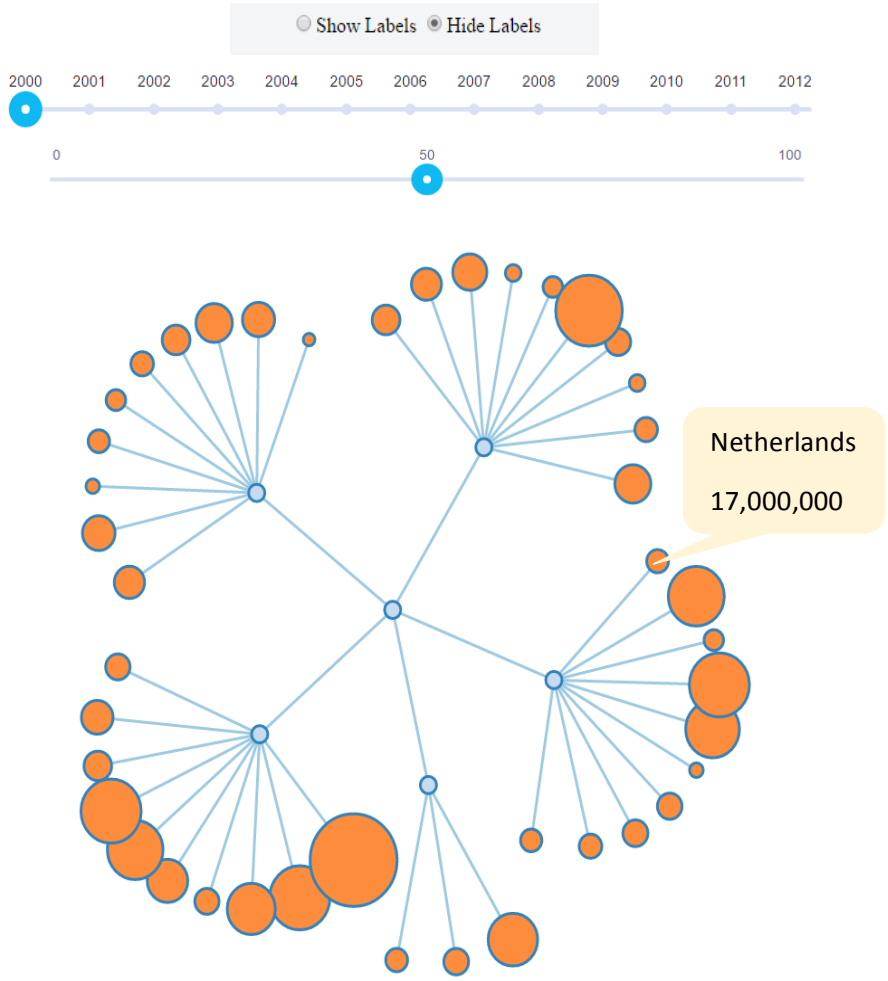
Additionally, provide another ***slider bar to filter (hide) some countries***. The slider bar should have a selection range from 0% to %100 with 1% increments. Let's call the selected percentage ***p***. Default value is 0% at the beginning. Find the ***highest population for the selected year*** (let's call it ***x***) and only show the countries with a population larger than ***p*x.*** For example, if the highest population is 1000 and the selected percentage is 70%, only show the countries with a population higher than 700 (1000*0.70=700). When the selected percentage is 0%, it shows all countries (i.e., do not filter any country) and when it is 100%, it hides all countries (i.e., filters all countries). Please note that when you hide a country node, you should also hide the edge that connects the node to the continent node. Do not hide a continent node even if you hide (filter) all countries of that continent node.

Note: You don't need to mimic the figures we provide. For example, for year selection slider bar, you don't need to have tick marks for each year. As long as it provides a selection from 2000 to 2012 with 1-year increments and shows the selected year in any form, it is fine.

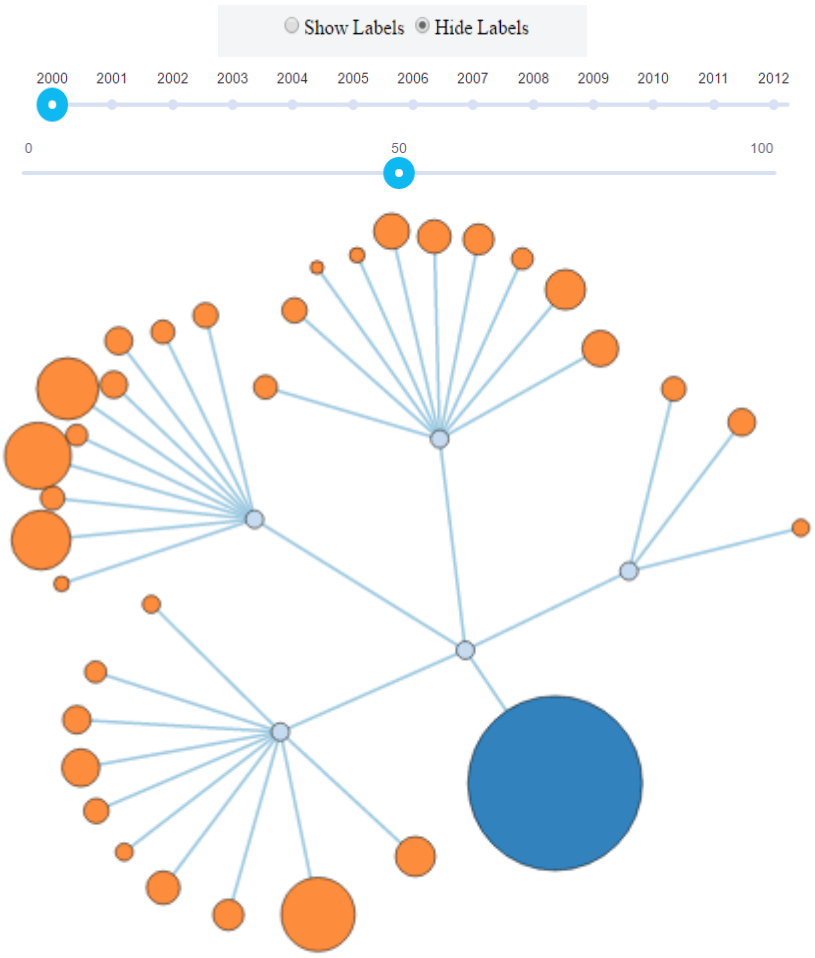
In addition to these main features of your graph, please enable following events.

Events:

MouseOver: When a mouse moves over a node, a tooltip should appear with the name and population information of the country/continent/world. You can create and style the tooltip anyway you prefer. For continents, the population is total population of corresponding countries and, for world, it is total population of all countries. The country filter function (slider bar) does not effect the population information of the continent/world. Even the hidden (filtered) countries' population is included in continent/world population.



Click: When a ***click*** event occurs on ***any continent/world node*** in the graph (a hierarchically organized force directed graph), it should collapse into a single node (hiding all corresponding countries or all continents in case of world), which has a size that is proportional to the total population of all corresponding countries. Please use a color for collapsed nodes that is different than country and uncollapsed continent/world nodes. When you ***click*** again on ***a collapsed node***, it should open up and return to the original form.



When a ***click*** event occurs on a ***country node*** in the graph, a bar chart should appear with the name and population values of the corresponding country for the year 2000 to 2012. You can create and style the tooltip anyway you prefer**.**

Please return in a directory:

- All your HTML, JavaScript and CSS files (you can have sub-directories if you prefer). Your main HTML file should be named as ***index.html***. When we open *index.html* in our web browser (*Chrome* will be used for grading), the visuals should show up in the main page.