데이터과학

데이터시각화

목표

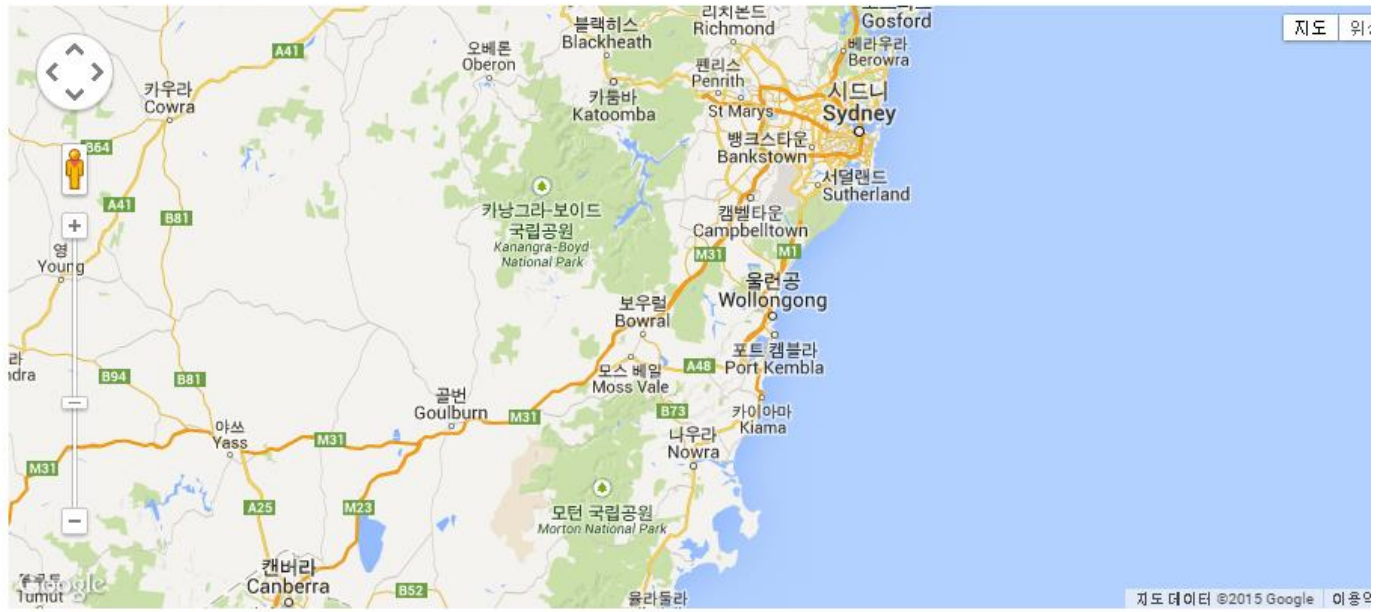
- 데이터분석의 결과를 시각화하는 다양한 프로그램의 학습
  - Google map
  - Google chart
  - D3.js

지도에 표시하기

- Google MAP
  - https://developers.google.com/maps/documentation/javascript/tutorial?hl=ko

- Naver MAP or Daum MAP API 이용가능

Simple Map



View this example full screen.

JavaScript | JavaScript + HTML

```
var map;
function initialize() {
  var mapOptions = {
    zoom: 8,
    center: new google.maps.LatLng(-34.397, 150.644)
  };
  map = new google.maps.Map(document.getElementById('map-canvas'),
      mapOptions);
}

google.maps.event.addDomListener(window, 'load', initialize);
```

Google public data

- Google data
  - http://www.google.com/publicdata/directory
- Google chart
  - https://developers.google.com/chart/

Google Search public data +Youngseok

Public Data

https://youtu.be/XtM8Gp6z2tE

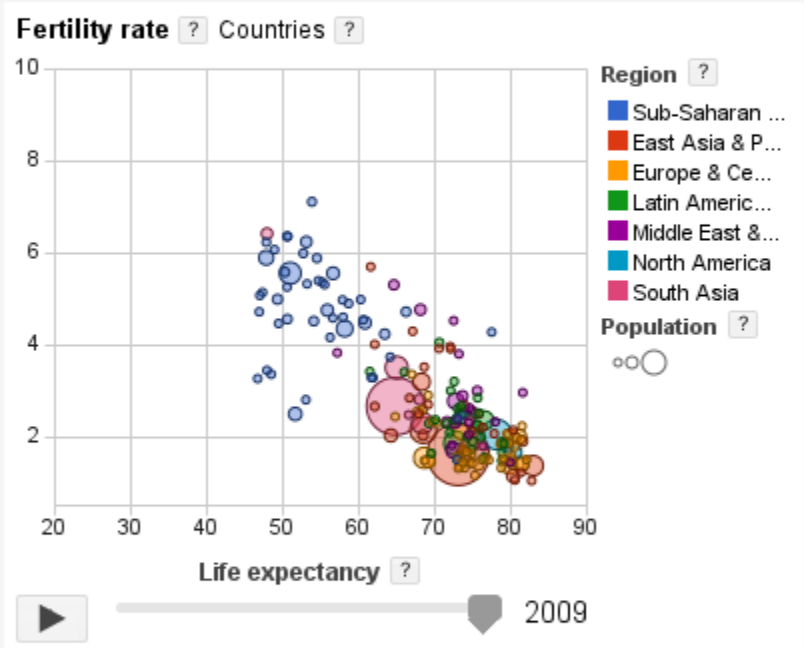
Lang

Datasets

Metrics

Any data provider (136)
Eurostat (10)
Destatis (7)
Statistics Iceland (6)
U.S. Bureau of Labor Statistics (5)
Central Statistics Office, Ireland (5)

My Datasets



Living longer with fewer children

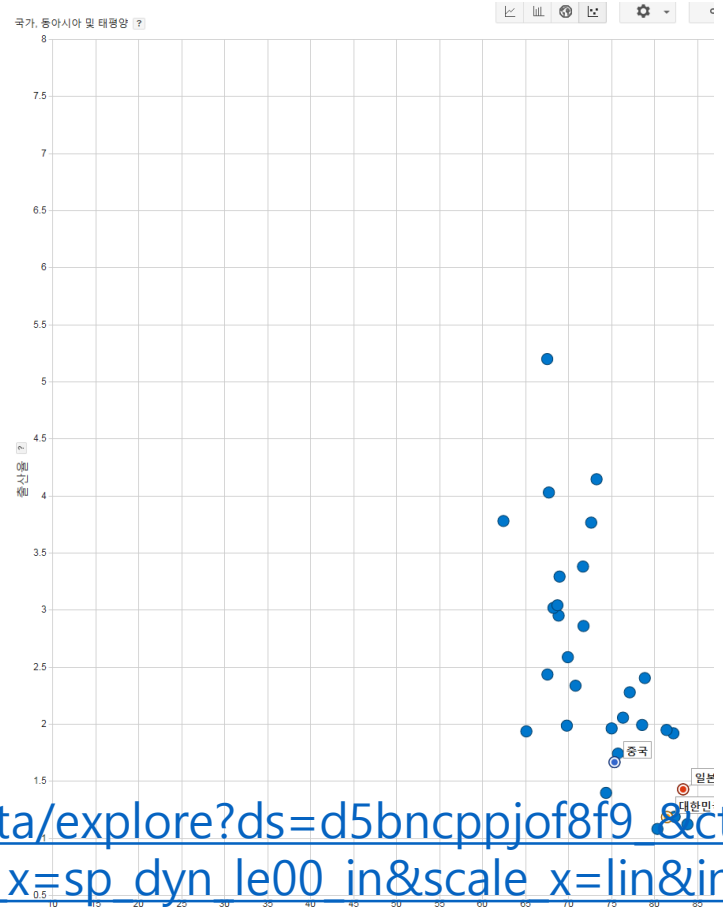
This chart correlates life expectancy and number of children per woman for each country in the world. The bubbles are sized by population and colored by region. Over time, most countries have moved towards the bottom right corner of the chart, corresponding to long lives and low fertility. Note the progression of the bubble for China- in the late 60's and 70's life expectancy rose quickly, then the implementation of the one-child policy caused a drop in the number of children per woman.

Explore the data

Dataset: World Development Indicators
Source: World Bank

World Development Indicators
World Bank
This dataset contains the World Development Indicators (WDI).

Motion Chart



http://www.google.com/publicdata/explore?ds=d5bncppjof8f9_&ctype=b&strail=true&bcs=d&nselm=s&met_x=sp_dyn_le00_in&scale_x=lin&ind_x=false&met_y=sp_dyn_tfrt_in&scale_y=lin&ind_y=false&idim=country:JPN:CHN:KOR:USA:GBR&ifdim=country&tunit=Y&pit=1380466800000&ind=false&icfg=d5bncppjof8f9_%253A1254%253Acountry%26%26JPN:::2013%7Cd5bncppjof8f9_%253A1254%253Acountry%26%26CHN:::2013%7Cd5bncppjof8f9_%253A1254%253Acountry%26%26KOR:::2013%7Cd5bncppjof8f9_%253A1254%253Acountry%26%26USA:::2013%7Cd5bncppjof8f9_%253A1254%253Acountry%26%26GBR:::2013

Google Chart 특징

- 무료
- 웹 기반의 차트로 HTML,CSS,JavaScript 기반
- 다양한 형식의 차트

Google Developers

Google Charts X 검색

yslee1225@gmail.com
로그아웃

제품 > Google Charts

Google Charts

g+1 2,951

- Overview
- Chart Gallery
- Advanced Usage
- Community
- API Reference

Google Chart News

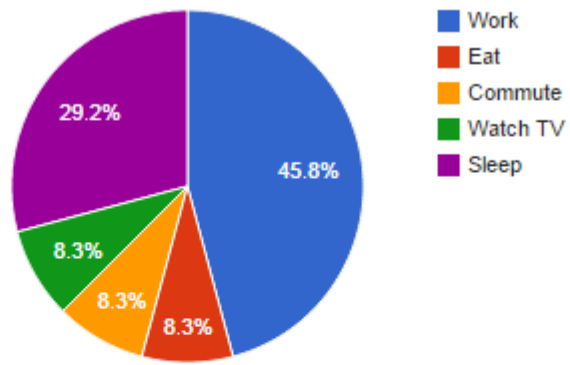
- Related Chart Tools
- Terms and Conditions

Display live data on your site

Google chart tools are powerful, simple to use, and free. Try out our rich gallery of interactive charts and data tools.

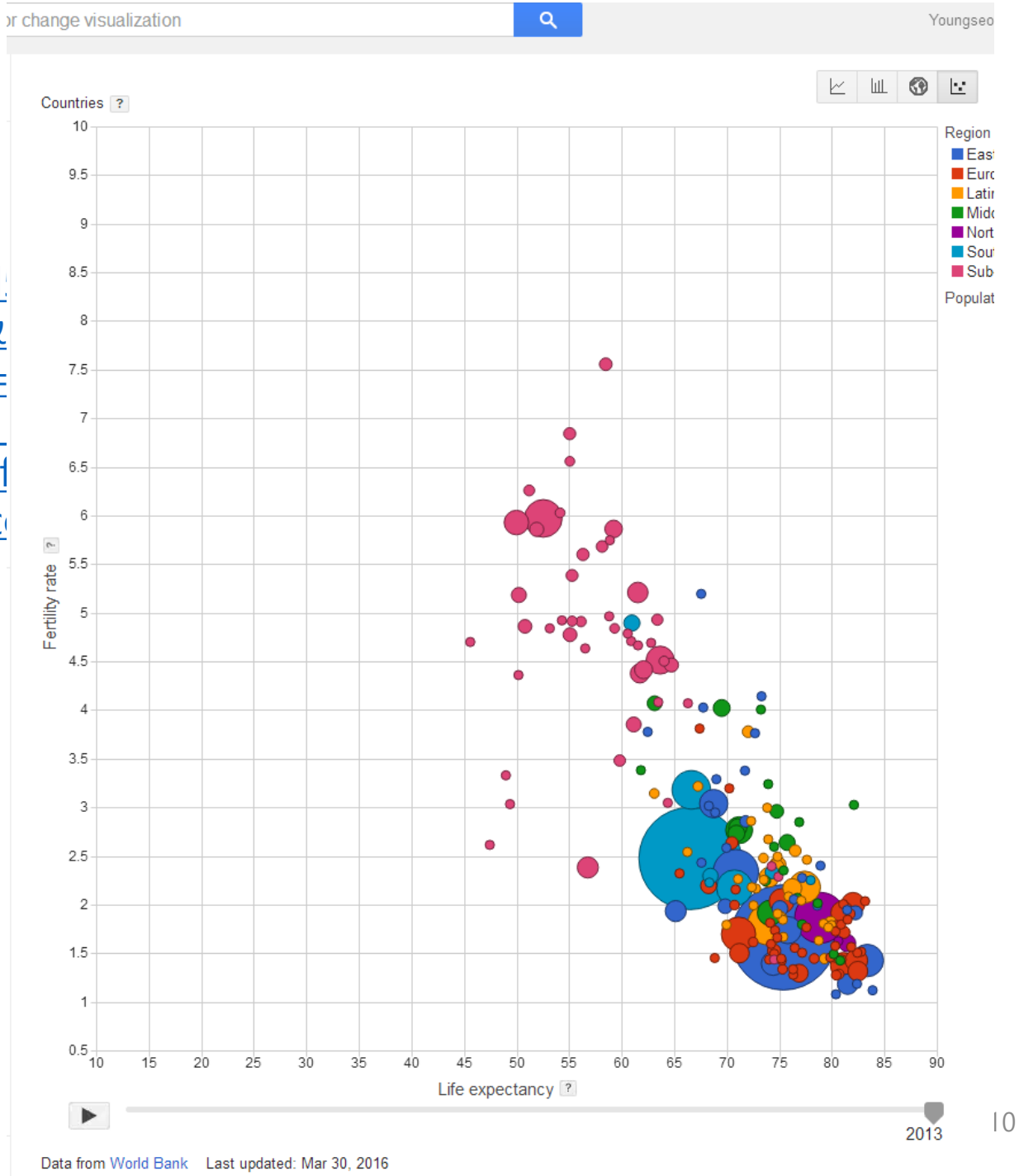
Get Started

Pie Chart - view source

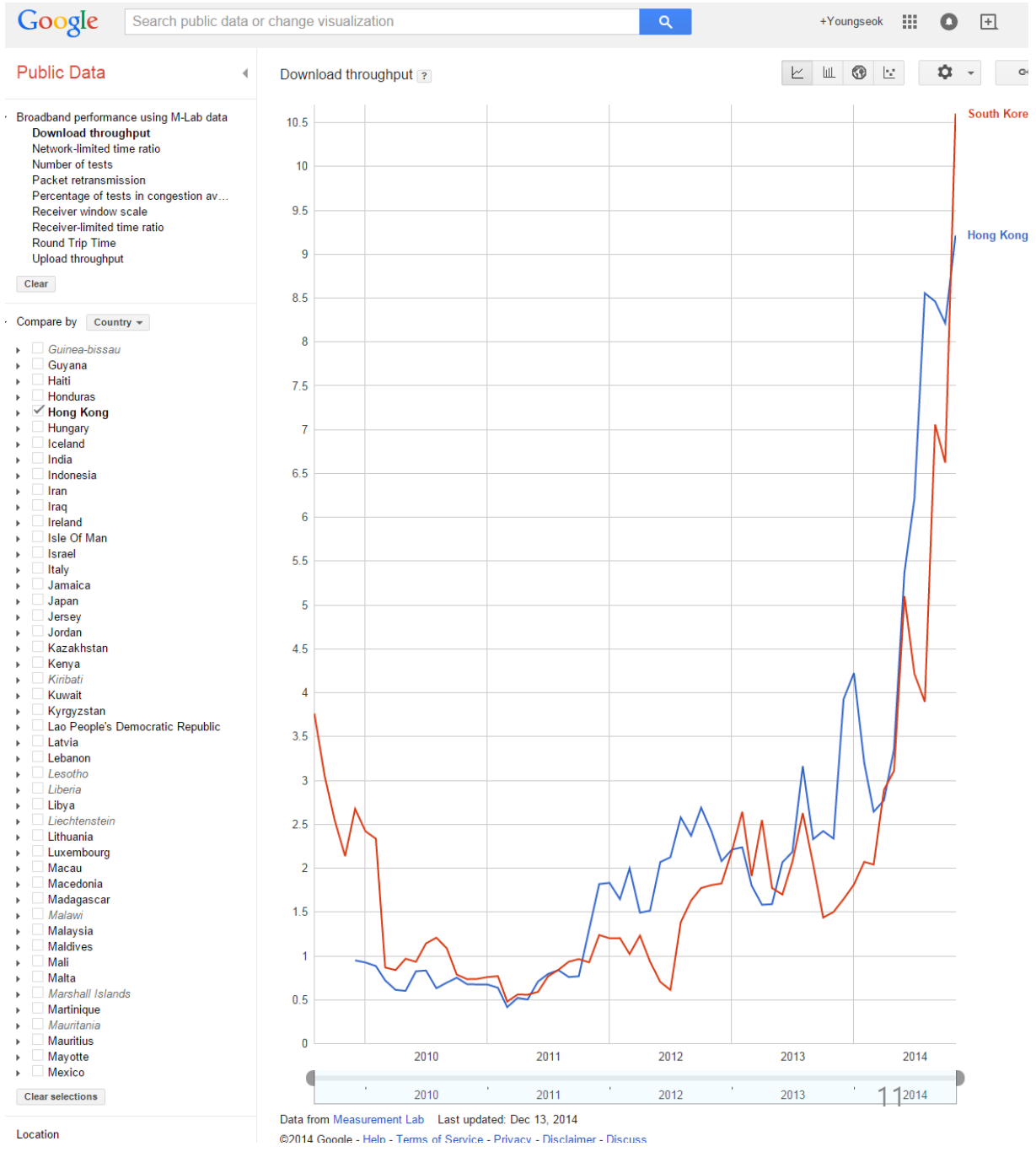


more

http://www.google.com/publicdata/explore?ds=d
jof8f9_&ctype=b&strail=false&bcs=d&nselm=s&
sp_dyn_le00_in&scale_x=lin&ind_x=false&met_y=
_tfrt_in&scale_y=lin&ind_y=false&met_s=sp_pop_
ale_s=lin&ind_s=false&dimp_c=country:region&if
ountry&hl=en_US&dl=en_US&ind=false&icfg&ic
=0.5



- Broadband performance using M-lab data
  - http://www.google.com/publicdata/explore?ds=e9krd11m38onf_&hl=en_US&dl=en_US#!ctype=l&strail=false&bcs=d&nselm=h&met_y=download_throughput&scale_y=lin&ind_y=false&rdim=country&idim=country:410:344&ifdim=country&hl=en_US&dl=en_US&ind=false



https://developers.google.com/chart/interactive/docs/gallery/motionchart

Visualization: Motion Chart

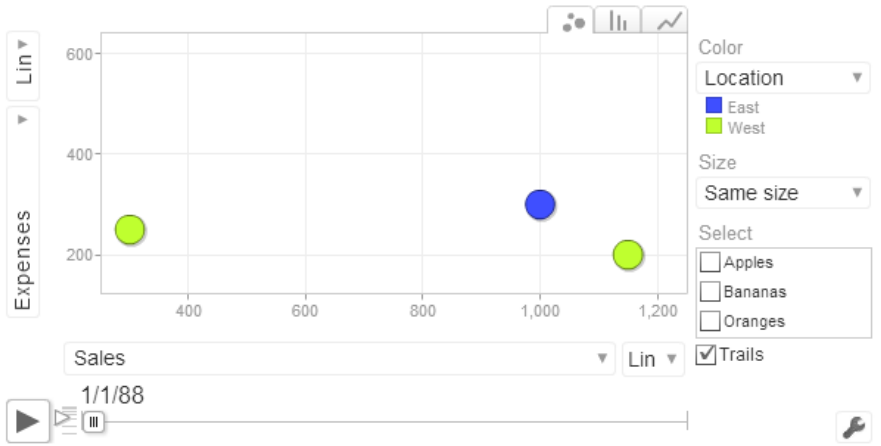
☆☆☆☆☆

Overview

A dynamic chart to explore several indicators over time. The chart is rendered within the browser using Flash.

★ **Note for Developers:** Because of Flash security settings, this (and all Flash-based visualizations) might not work correctly when accessed from a file location in the browser (e.g., file:///c:/webhost/myhost/myviz.html) rather than from a web server URL (e.g., http://www.myhost.com/myviz.html). This is typically a testing issue only. You can overcome this issue as described on the Adobe web site.

Example



R에서 Google Chart를 써보자!

- https://code.google.com/p/google-motion-charts-with-r/
- https://cran.r-project.org/web/packages/googleVis/vignettes/googleVis_examples.html

```
library(googleVis)
demo(WorldBank)
```

Gapminder

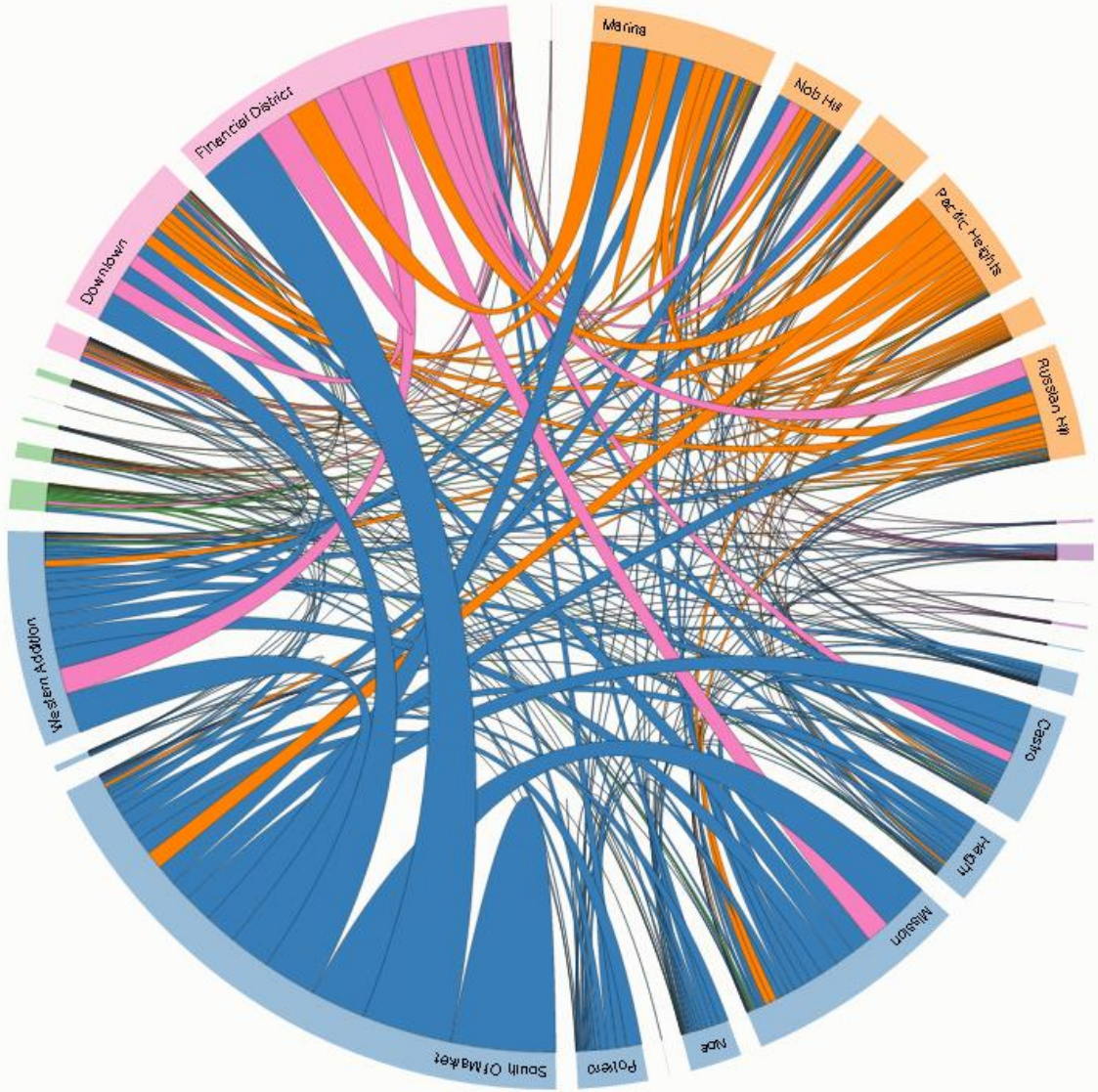
- http://www.nyu.edu/mph/discover/visualizing_data.html
- Prof. Hans Rosling
  - https://www.youtube.com/watch?v=hVimVzgtD6w

https://www.gapminder.org/tools/bubbles#_state_time_value=1804&playing:true;&entities_select@_geo=kor&trailStartTime=1840

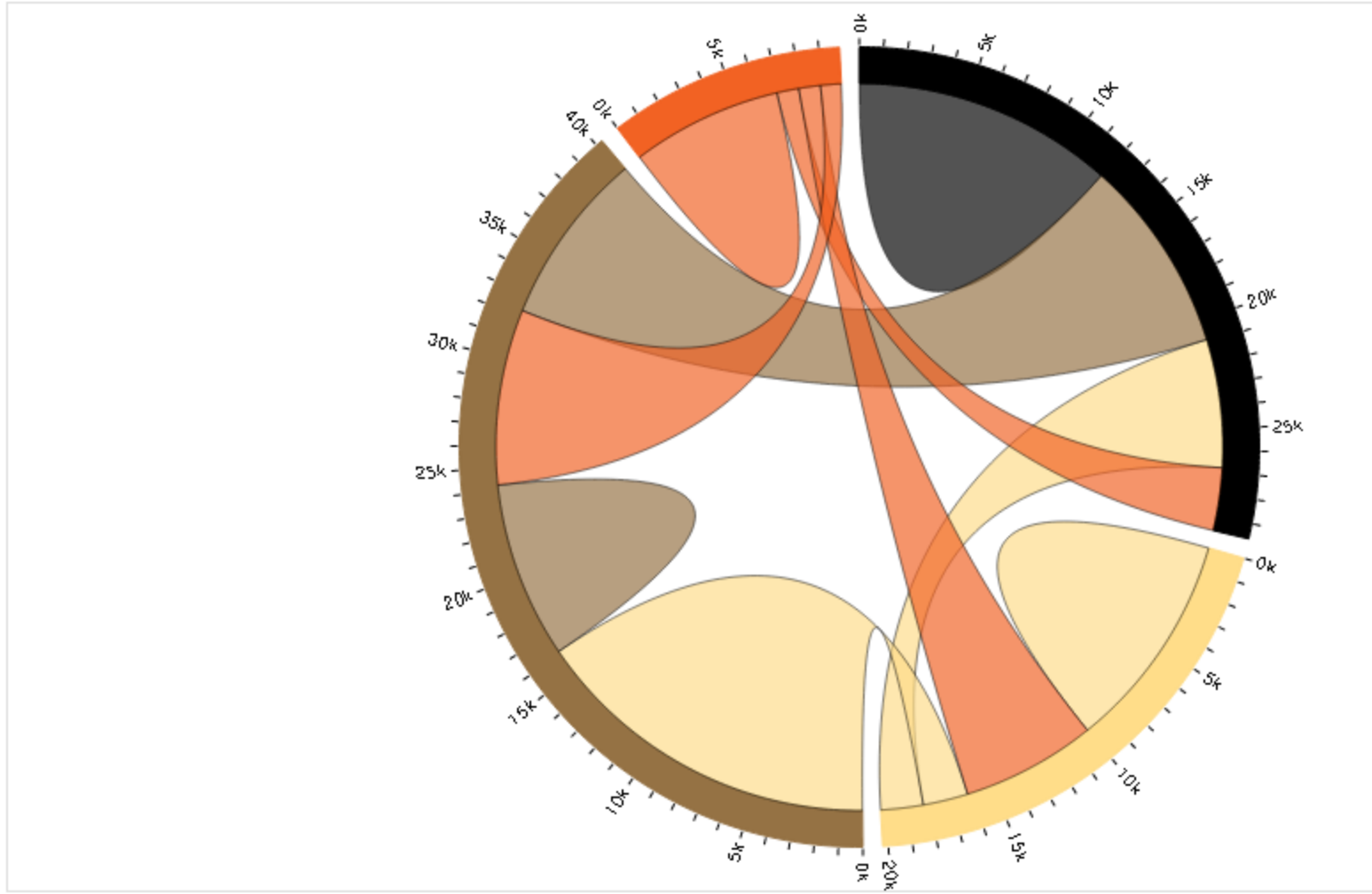
D3.js
http://d3js.org/

- 우버 데이터 시각화: Chord
  - http://bost.ocks.org/mike/uberdata/
- D3.js Chord source code
  - https://github.com/mbostock/d3/wiki/Chord-Layout
  - http://bl.ocks.org/mbostock/4062006
- 타슈데이터 시각화: Chord
  - http://networks.cnu.ac.kr/chord/
- 생물학 시각화
  - http://mkweb.bcgsc.ca/
- Bart ridership
  - http://vudlab.com/bart/
- Mike Bostock
  - http://bost.ocks.org/mike/d3/workshop/#0
- http://mobicon.tistory.com/275

Uber Rides by Neighborhood

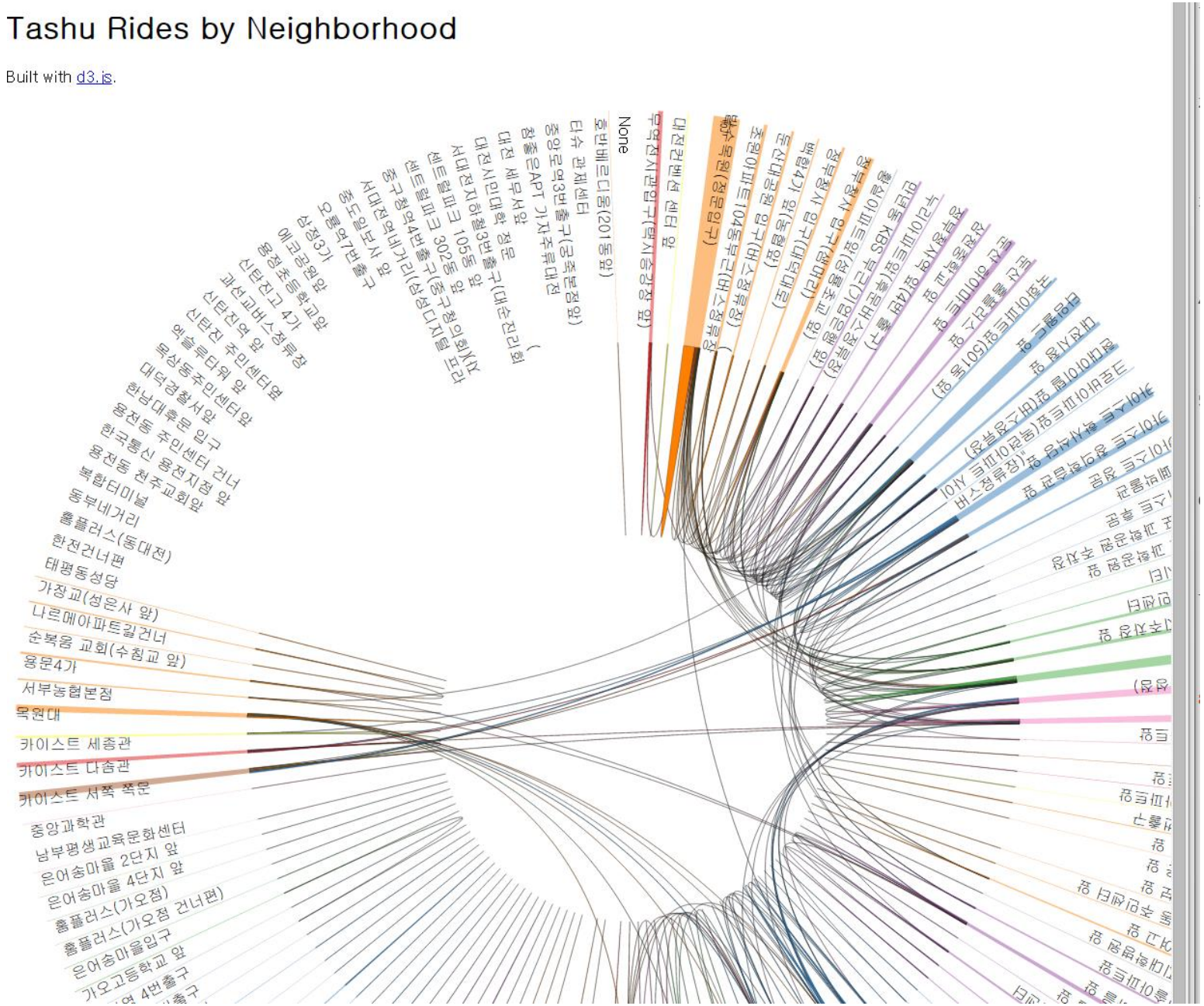


Chord Diagram



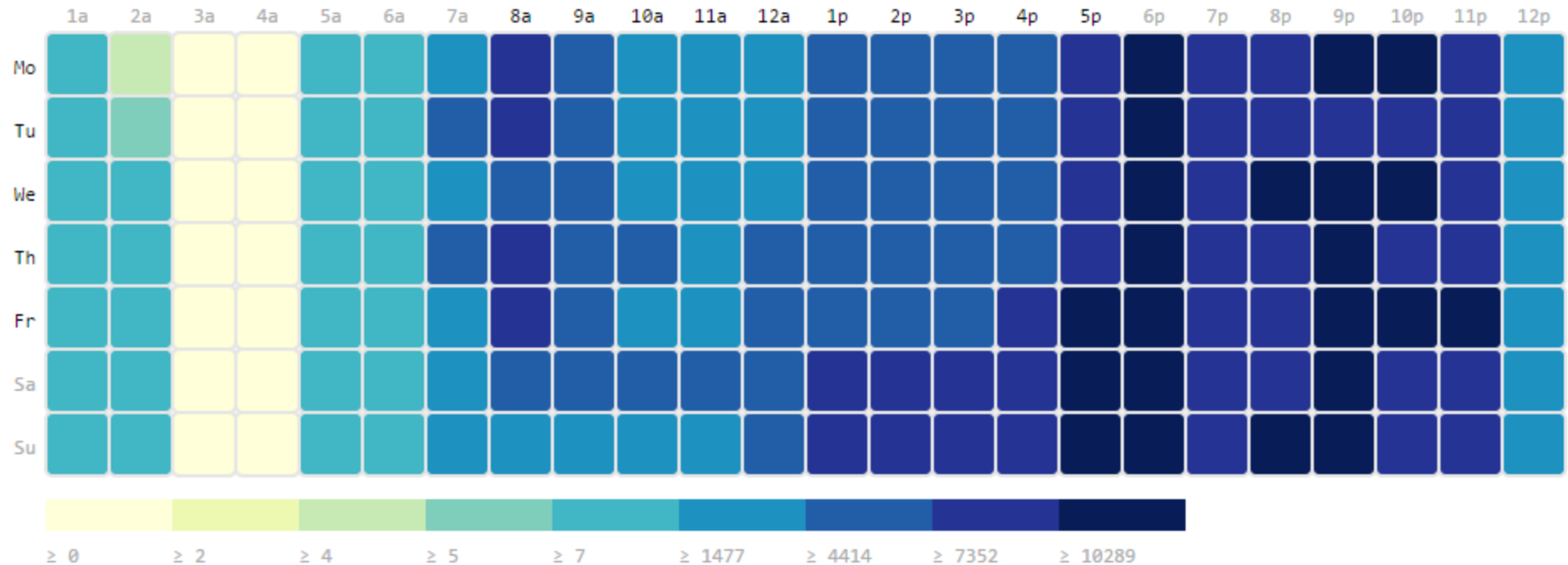
index.html

```
<!DOCTYPE html>
<meta charset="utf-8">
<style>

body {
  font: 10px sans-serif;
}

.chord path {
  fill-opacity: .67;
  stroke: #000;
  stroke-width: .5px;
}

</style>
<body>
<script src="http://d3js.org/d3.v3.min.js"></script>
<script>

// From http://mkweb.bcgsc.ca/circos/guide/tables/
var matrix = [
  [11975,  5871, 8916, 2868],
  [ 1951, 10048, 2060, 6171],
  [ 8010, 16145, 8090, 8045],
  [ 1013,   990,  940, 6907]
];

var chord = d3.layout.chord()
    .padding(.05)
    .sortSubgroups(d3.descending)
    .matrix(matrix);

var width = 960,
    height = 500,
    innerRadius = Math.min(width, height) * .41,
    outerRadius = innerRadius * 1.1;

var fill = d3.scale.ordinal()
    .domain(d3.range(4))
    .range(["#000000", "#FFDD89", "#957244", "#F26223"]);

var svg = d3.select("body").append("svg")
    .attr("width", width)
    .attr("height", height)
  .append("g")
    .attr("transform", "translate(" + width / 2 + "," + height / 2 + ")");

svg.append("g").selectAll("path")
    .data(chord.groups)
  .enter().append("path")
    .style("fill", function(d) { return fill(d.index); })
    .style("stroke", function(d) { return fill(d.index); })
    .attr("d", d3.svg.arc().innerRadius(innerRadius).outerRadius(outerRadius))
    .on("mouseover", fade(.1))
    .on("mouseout", fade(1));

var ticks = svg.append("g").selectAll("g")
    .data(chord.groups)
```


Tashu Rides by Neighborhood
Built with d3.js.
None
호반베르디움(201동앞)
타슈 관제센터
중앙로역3번출구(궁촌본점앞)
한빛은APT 가자주유대전
대전 세무서앞
대전시민대학 정문
서대전지하철3번출구(대순진리회
셀트랄파크 105동 앞
중구청역4번출구(삼성디지털프라
서대전역네거리
중도일보사 앞
오룡역7번출구
삼정3기
에코로원앞
목원초등학교앞
신탄진고 4기
과선교버스정류장
신탄진 주민센터앞
신탄진역 앞
역촌루터워 앞
목상동주민센터앞
대덕경찰서앞
한남대후문 입구
용전동 주민센터 건너
한국통신 용전지점 앞
용전동 천주교회앞
복합터미널
동부네거리
홈플러스(동대전)
한전건너편
태평동성당
가장교(성은사 앞)
나르메아파트길건너
순복음 교회(수침교 앞)
용문4가
서부농협본점
목원대
카이스트 세종관
카이스트 다솜관
카이스트 서쪽 쪽문
중앙과학관
남부평생교육문화센터
은어송마을 2단지 앞
은어송마을 4단지 앞
홈플러스(가오점)
홈플러스(가오점 건너편)
은어송마을입구
가오고등학교 앞

Tashu 2013 Heatmap

by yslee, 2013-8-25



관련 스터디 링크

- http://opendata.cnu.ac.kr/~luha-dnlab/tashu/
- http://mobicon.tistory.com/275

실습

- D3.js로 chord 와 heatmap 타슈데이터 시각화

- Google classroom으로 제출