Micro-module E: Data-visualisation Overview

E1- Information Graphics

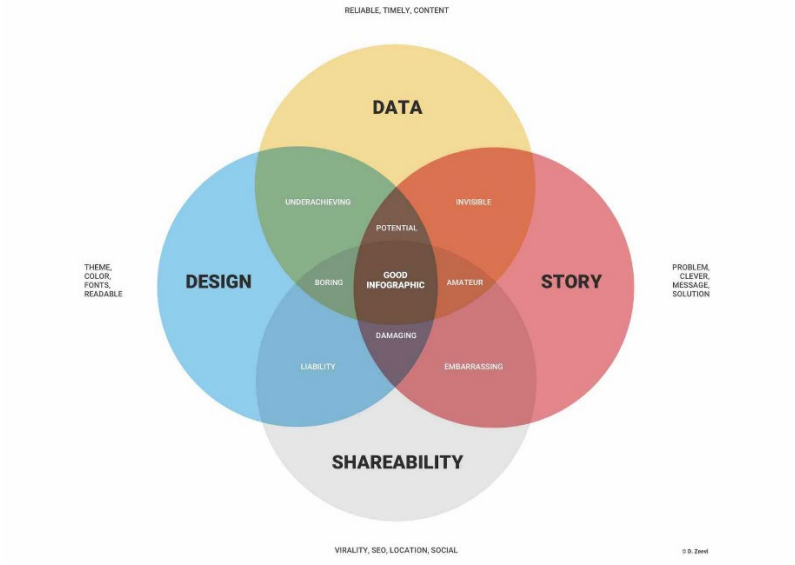
Infographics have the power to present complex data in a concise, highly visual way. They tell data stories effectively by making information easy to digest, educational, and engaging. Infographics have been commonly used in presenting scientific research including quantitative urban analytic areas. In this tutorial, you will learn the basic skills of creating infographics, including the introduction on types and their application in urban research, different sources/platforms for easily making infographics. Also, this tutorial will show how to make a radar chart via Echarts as an example.

1. Introduction of Infographic

1.1 What is Infographic?

The most common definition of Infographic describes it simply as a visual representation of information and data. By combining elements of text image, chart, diagram and, more recently, video, an infographic is an effective tool to present data and explain complex issues in a way that can quickly lead to insight and better understanding.

The term “infographics” has expanded to many industries in the past decade, becoming a powerful communication tool for businesses, governments and educational institutions. There's a whole new audience of professionals interested in presenting data in a more compelling, insightful and engaging way. Infographics have the power to present complex data in a concise, highly visual way. When done right, they tell data stories effectively by making information easy to digest, educational, and engaging.

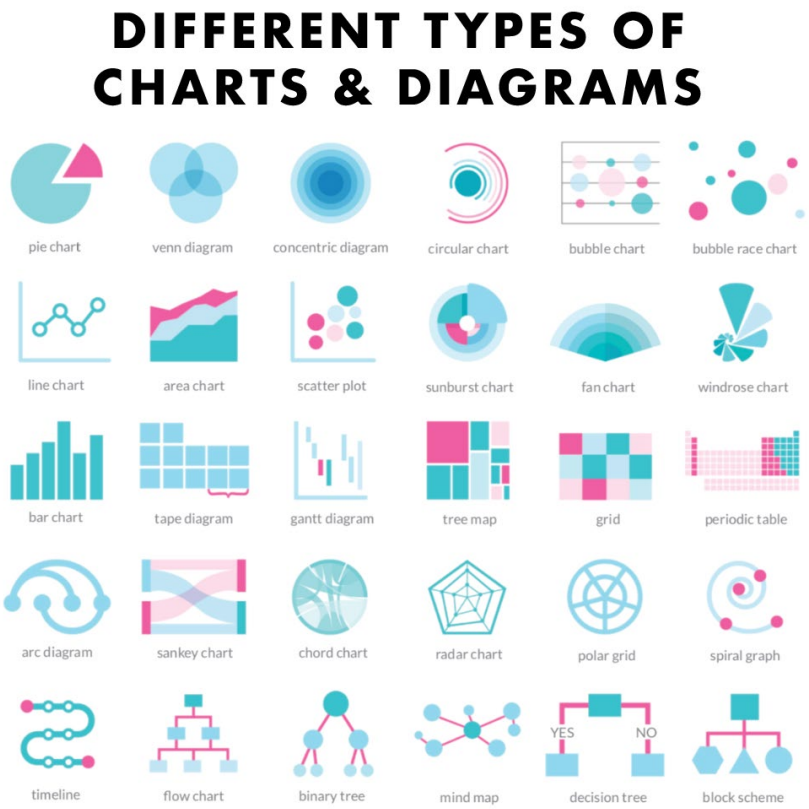


Source: https://infogram.com/page/infographic

1.2 The Types of Infographics

Different industries have different ways of classifying infographics, with advertising, education and other industries preferring a client-driven approach to classifying infographics, which also includes types not often used in urban research, such as Visual Article, Number Port, Useful Bait, etc. In this tutorial, we will categorise infographics

according to the type of information they express, including the distribution of data, links between data, comparisons, trends, the composition of data elements, and the distribution of data characterised by geo-locations.

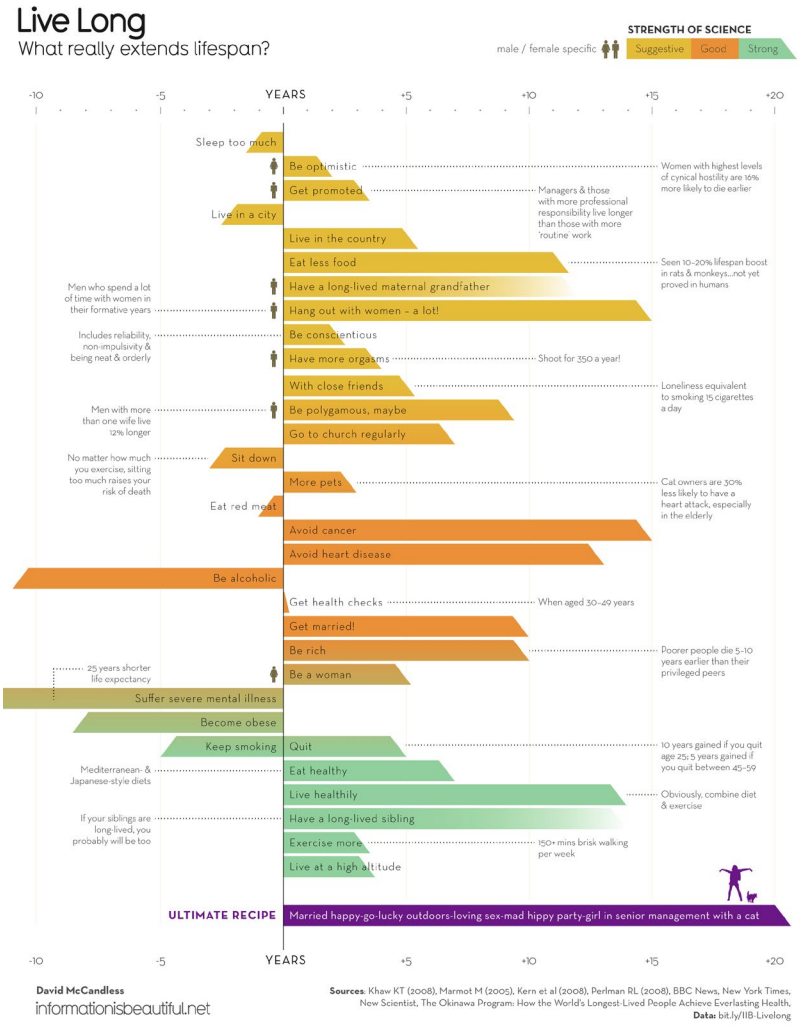


https://theunspokenpitch.com/charts/

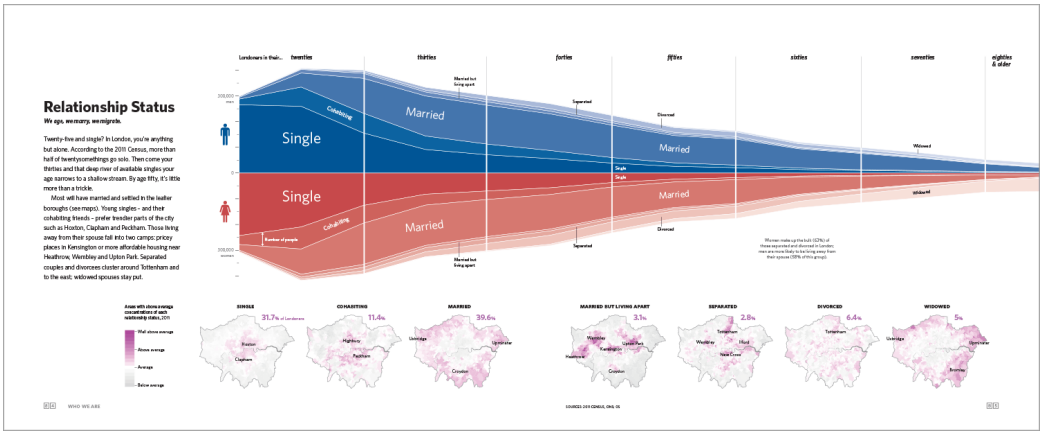
1.3 Applications of Infographics in Urban Research Area

Distribution of Data： Scatterplot

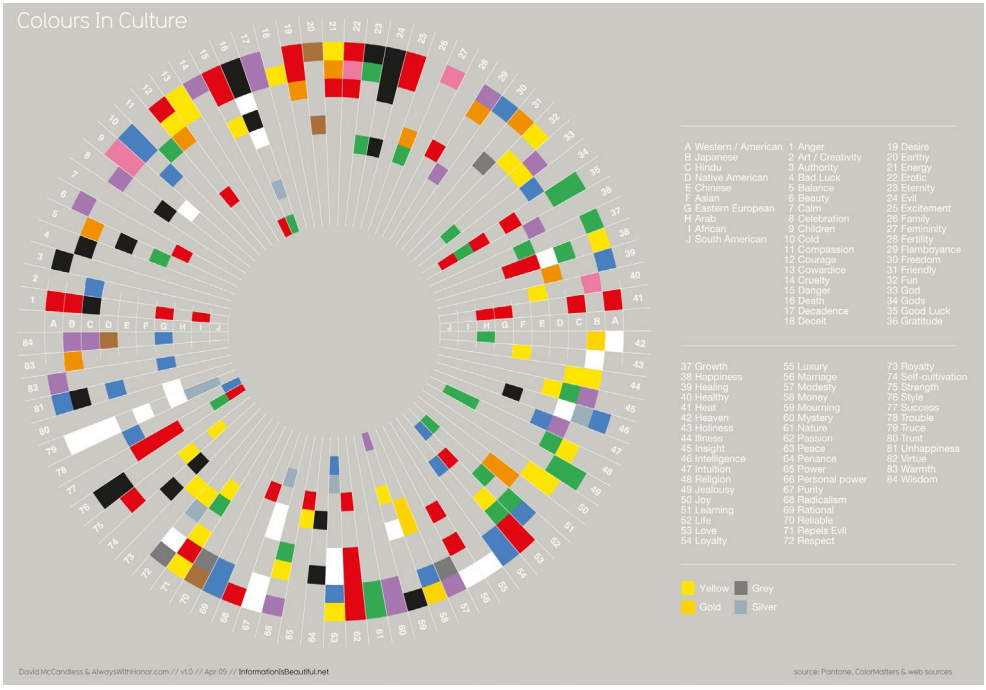
To show comparisons： bar chart

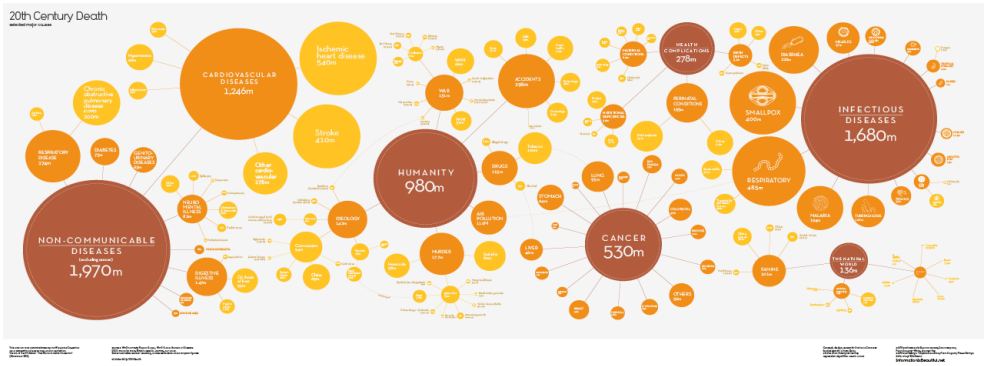


To show the trend of data changes: Area chart and line grah

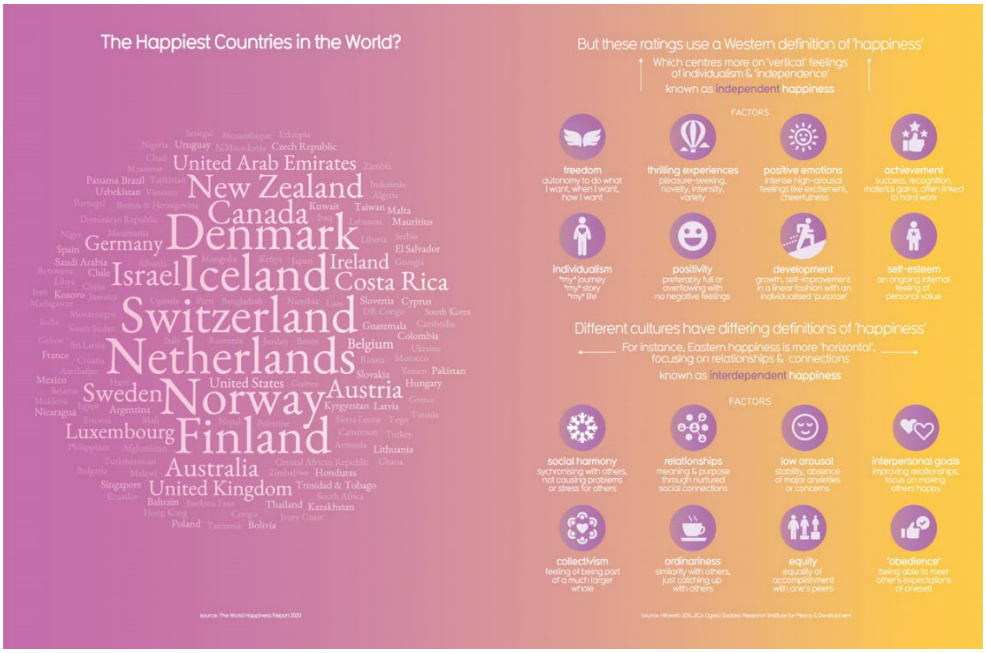


To show the links between data: Sunburst and Graph

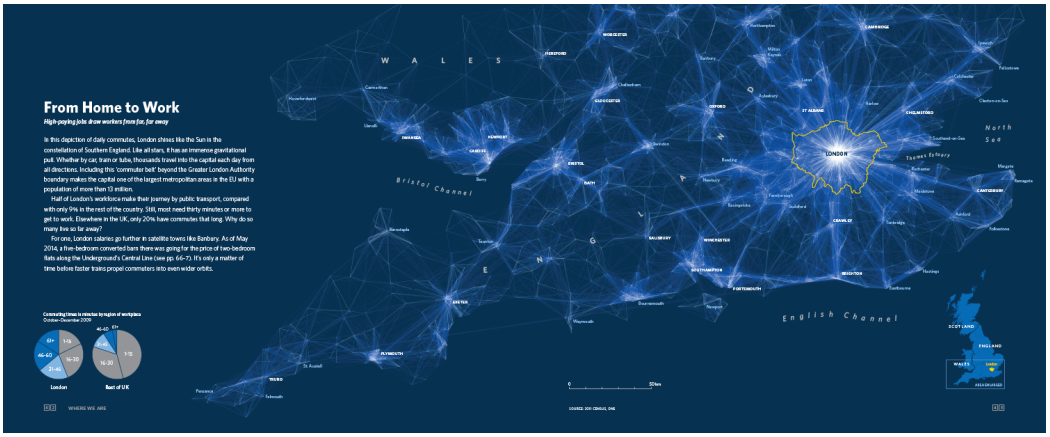


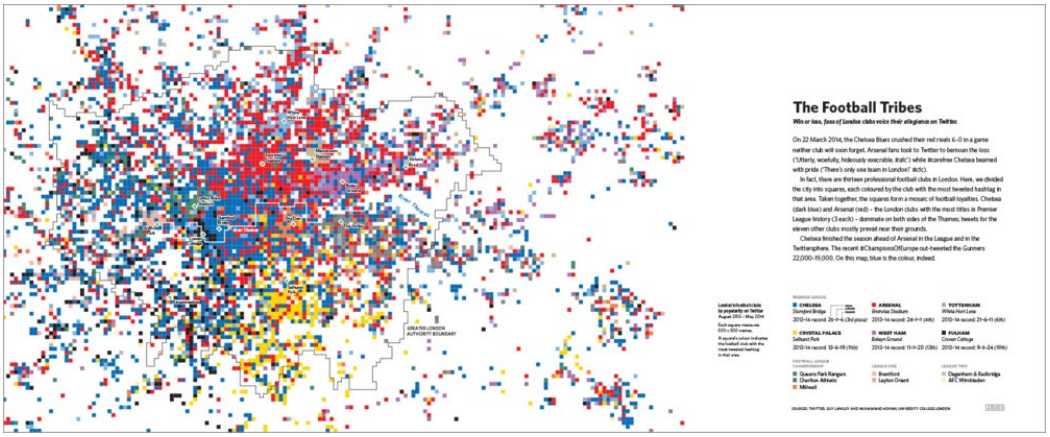


To show the composition of data elements: Wordcloud



To showthe distribution of data characterised by geo-locations: Maps





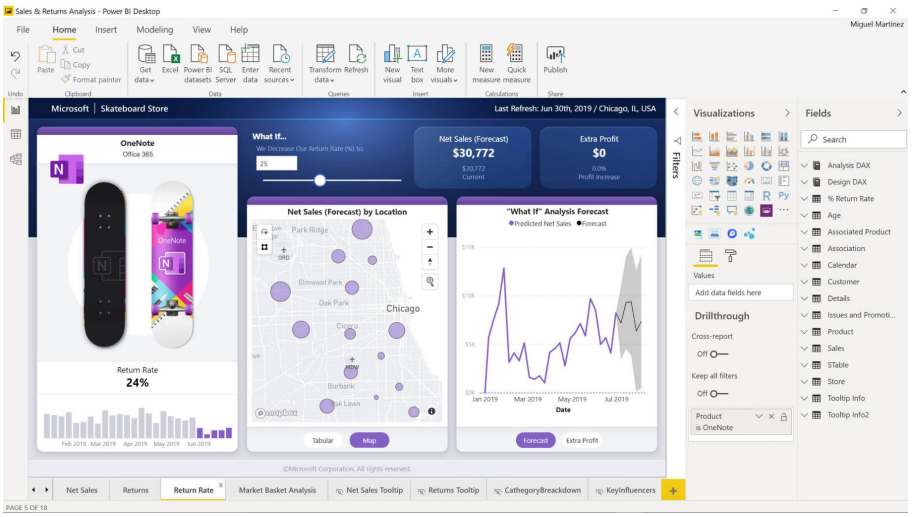
It is worth noting that in urban research we often need to combine several types of infographics in order to better represent the data.

2. Tools/ Platforms for Making Infographics

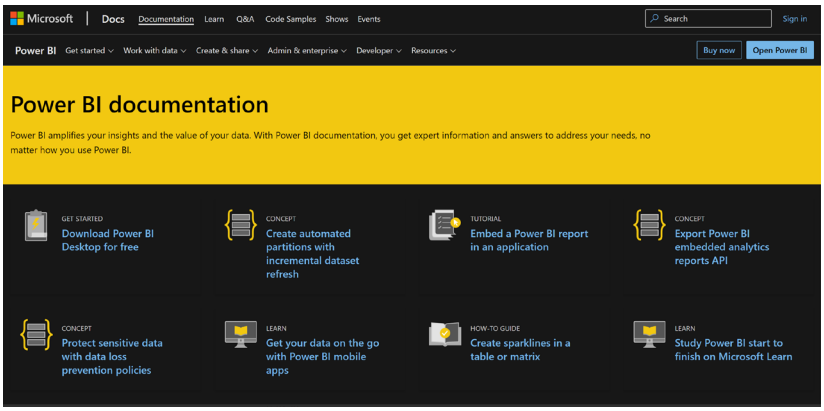
2.1 Power BI

Power BI Desktop is a free application you install on your local computer that lets you connect to, transform, and visualize your data. With Power BI Desktop, you can connect to multiple different sources of data, and combine them (often called modeling) into a data model. This data model lets you build visuals, and collections of visuals you can share as reports, with other people inside your organization.

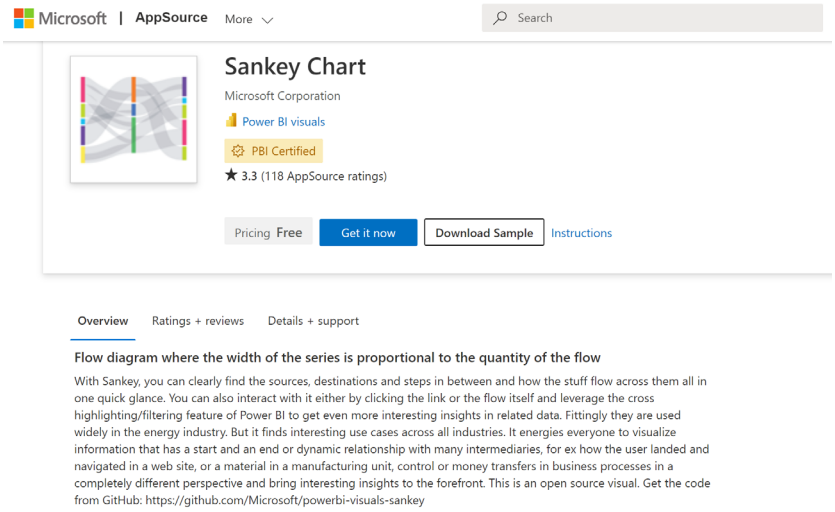
Power BI provides different types of documentation and tutorials for beginners, the visual plugins such as Sankey chart and word cloud can be downloaded on Microsoft Store.



https://powerbi.microsoft.com/en-us/desktop/



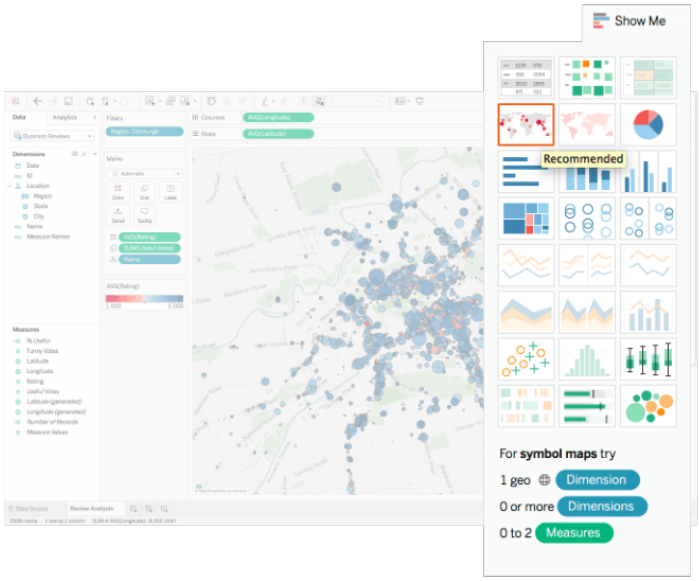
https://docs.microsoft.com/en-us/power-bi/



https://appsource.microsoft.com/en-us/product/office/WA104380777?src=office&corrid=9db8166c-0f97-d42d-9d80-55ca3b95d797&omexanonuid=&referralurl=

2.2 Tableau

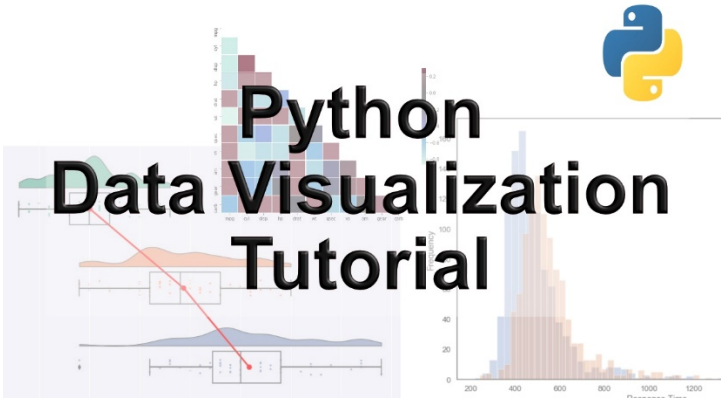
Tableau is the most used solution for very large sets of data. It mixes a classic but modern graphic style and a superbly powerful data motor.



https://www.tableau.com/

2.3 Python Visualization

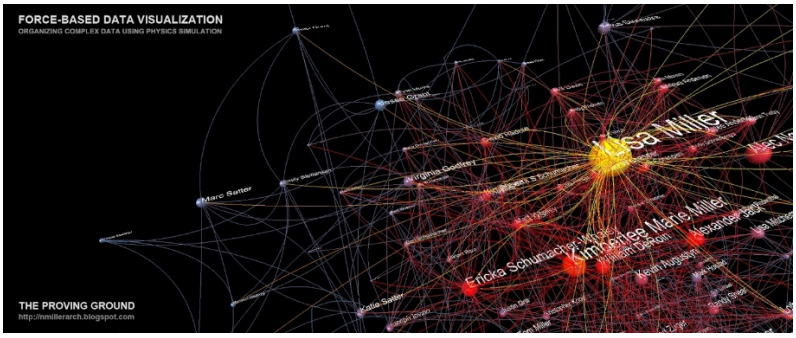
Python can quickly process and filter data, it could also help us to visualize huge amount of data. Using Python, we can learn how to create data visualizations and present data in Python using the Seaborn package. However, this requires a certain level of coding skills.



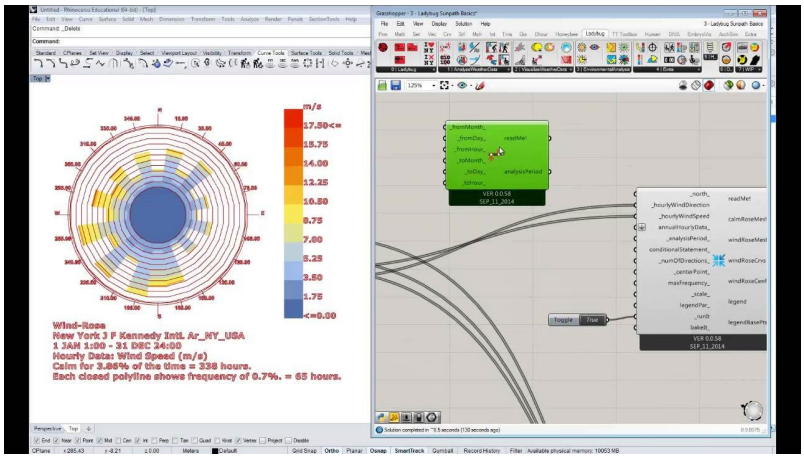
https://www.marsja.se/python-data-visualization-techniques-you-should-learn-seaborn/

2.4 Grasshopper in Rhino

Using the different plug-ins in grasshopper many complex graphical representations can be realised, e.g. graphing the connections between tens of thousands of twits. In addition to this, climate analysis, which is often used in urban analysis, such as wind roses, can also be quickly plotted in ladybug.



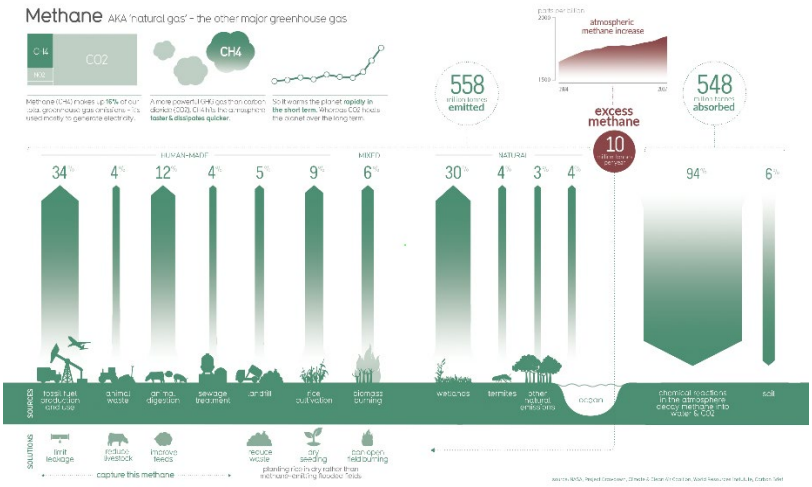
http://www.theprovingground.org/2011/09/force-based-data-visualization.html



https://www.food4rhino.com/en/app/ladybug-tools

2.5 Adobe Illustrator

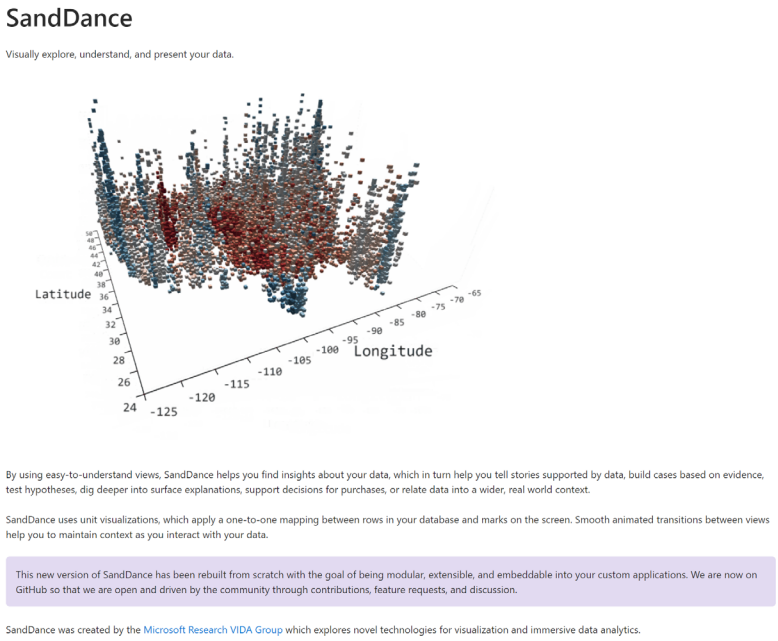
We often need to style and combine vector data in Adobe Illustrator, which allows us to keep our data editable.



2.6 Online Tools

-SandDance

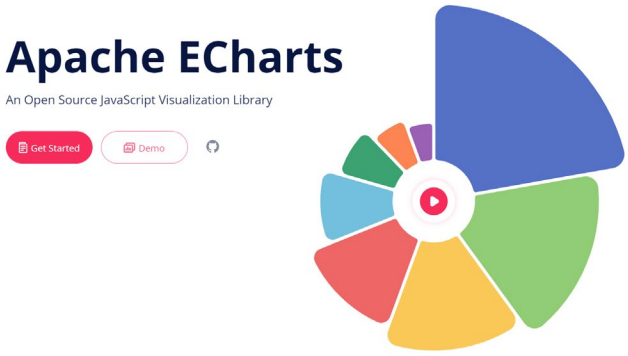
SandDance is a visual solution based HTML 5. It provides 2d and 3d visuals for selection. We can basically use it online, but it could also serves as visuals plugin in Power BI. In the GitHub homepage, there're many online tutorials for starting SandDance, and for the advanced functions, you could also check the research outcomes. Let's try on SandDance web, for the pre-uploaded data, the right window shows the visual result, we can choose different legend to filter the data. It also provide a black background visuals. When you upload data, SandDance will pre-choose the suitable chart type for your data, but you can change the type on the right, and also re-identify the color ramp.



https://microsoft.github.io/SandDance/app/

-Echarts

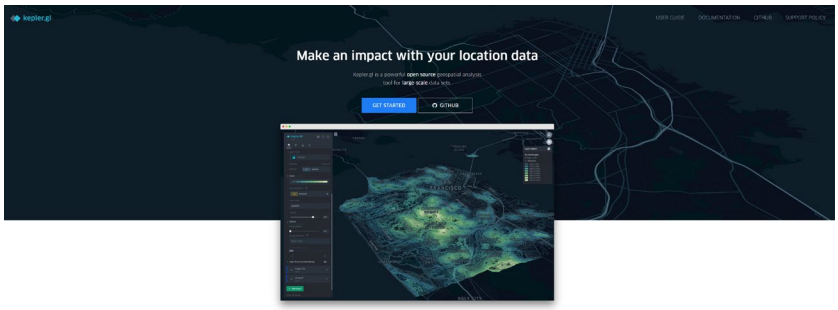
The second online tool is echarts, echarts is based on java script. We can edit the existing examples and download the specific script, which could apply to other platforms or convert to phython script. We can enter the gallery, which provide us varied open sourse examples, that can include almost all common charts. Also, in the resoures bar, we can check charts with different theme inserted. Echarts community will hold seminars every year, you can learn adavanced skills from people all over the world.



https://echarts.apache.org/en/index.html

-Kepler

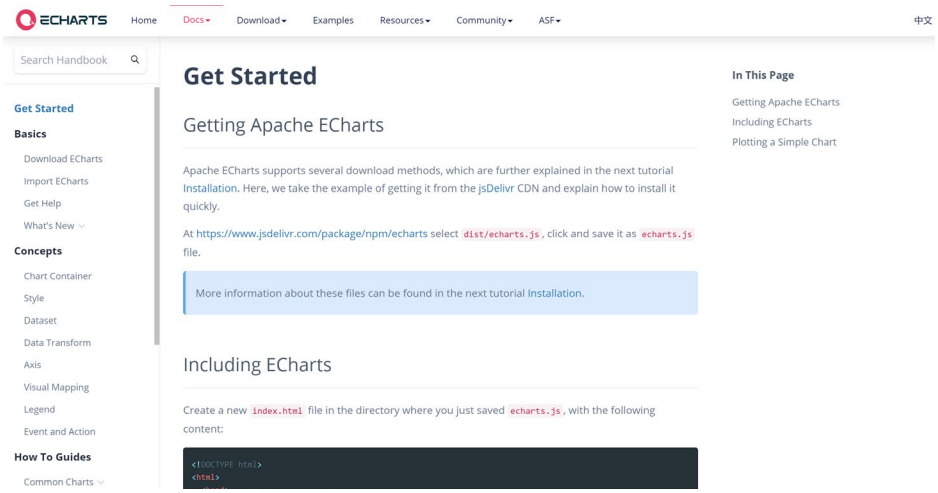
Kepler can help us easily make nice map, such as point map and heatmap. It's a open source, free online platform.



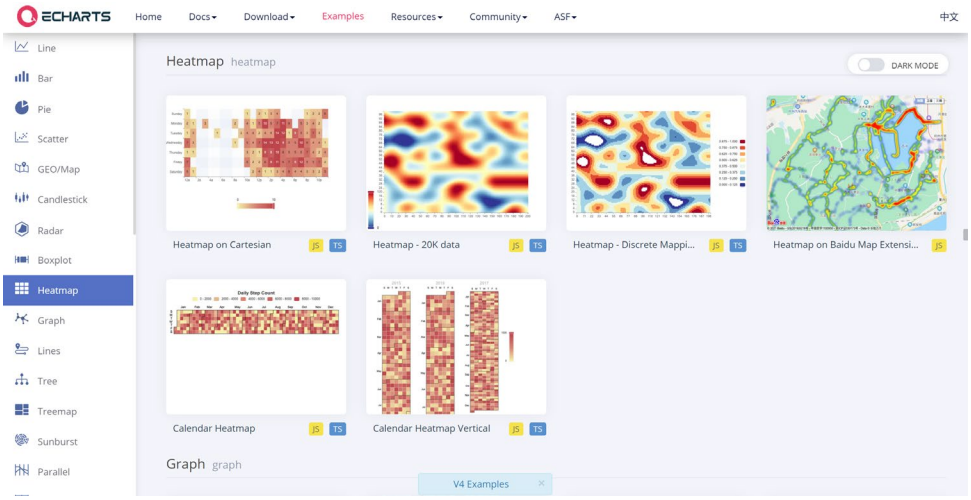
https://kepler.gl/

3. Making a Radar Chart

Echart is based on Java and HTML 5. With the simplified API, we can more easily modify the results of data visualisation by modifying specific parameters.



You can learn the basic concepts in the official user manual provided by Echarts, including Chart Container, Style, Dataset, Data Transform, Visual Mapping, and Legend. The visualisation results can be exported as a vector SVG file.



Echarts provides a large number of examples, including almost all types of commonly used visual charts. We can browse the gallery and find the example we need, go to the

details page to see the code and import our own data.

Taking radar chart as an example, when entering the dashboard of this chart, on the left you will see the script bar, you can change the values of different elements in the first box, and you can see the full coding in Java in the second box, also, you could check the visual preview in the last box. When you edit the codes, the chart will change to show you the visualization result. After your edits, you can download the javascript or do a screenshot to save the chart.