# What is a graph?

A graph is a mathematical construction which captures pairwise relations between objects.

A graph is composed of:
1. Nodes (vertices, points, *nodos*)
2. Edges (paths, links, *arcos, caminos*)
3. $G = (V, E)$

# Graphical representations of Graphs

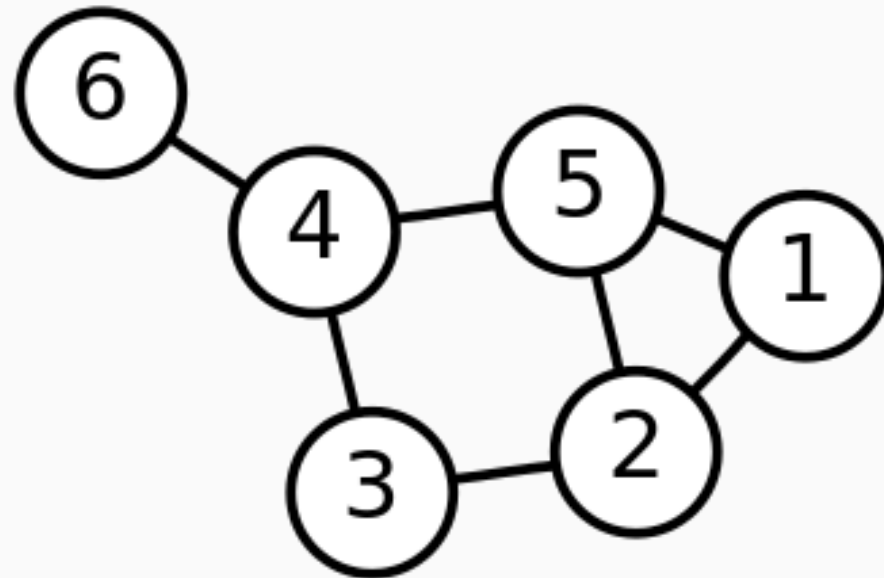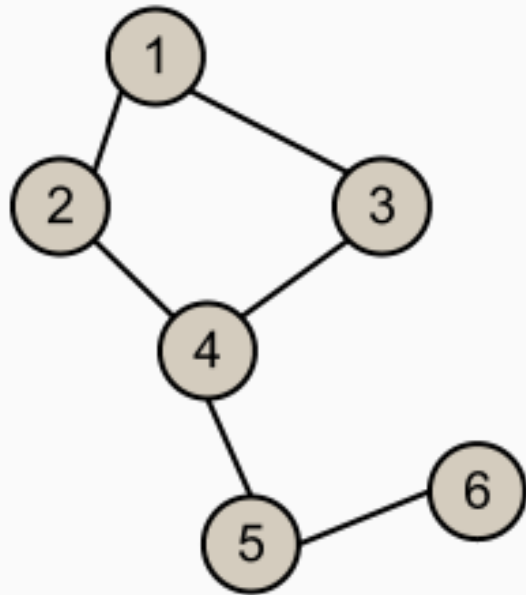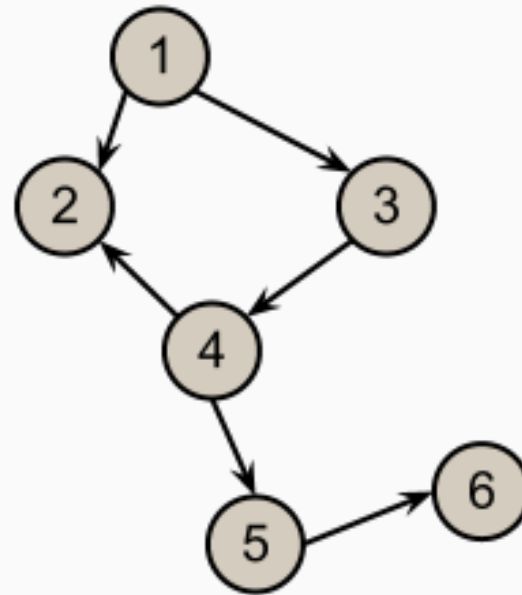Graphs come in all shapes and sizes, a common graphical representation is:



Image courtesy of Wikipedia
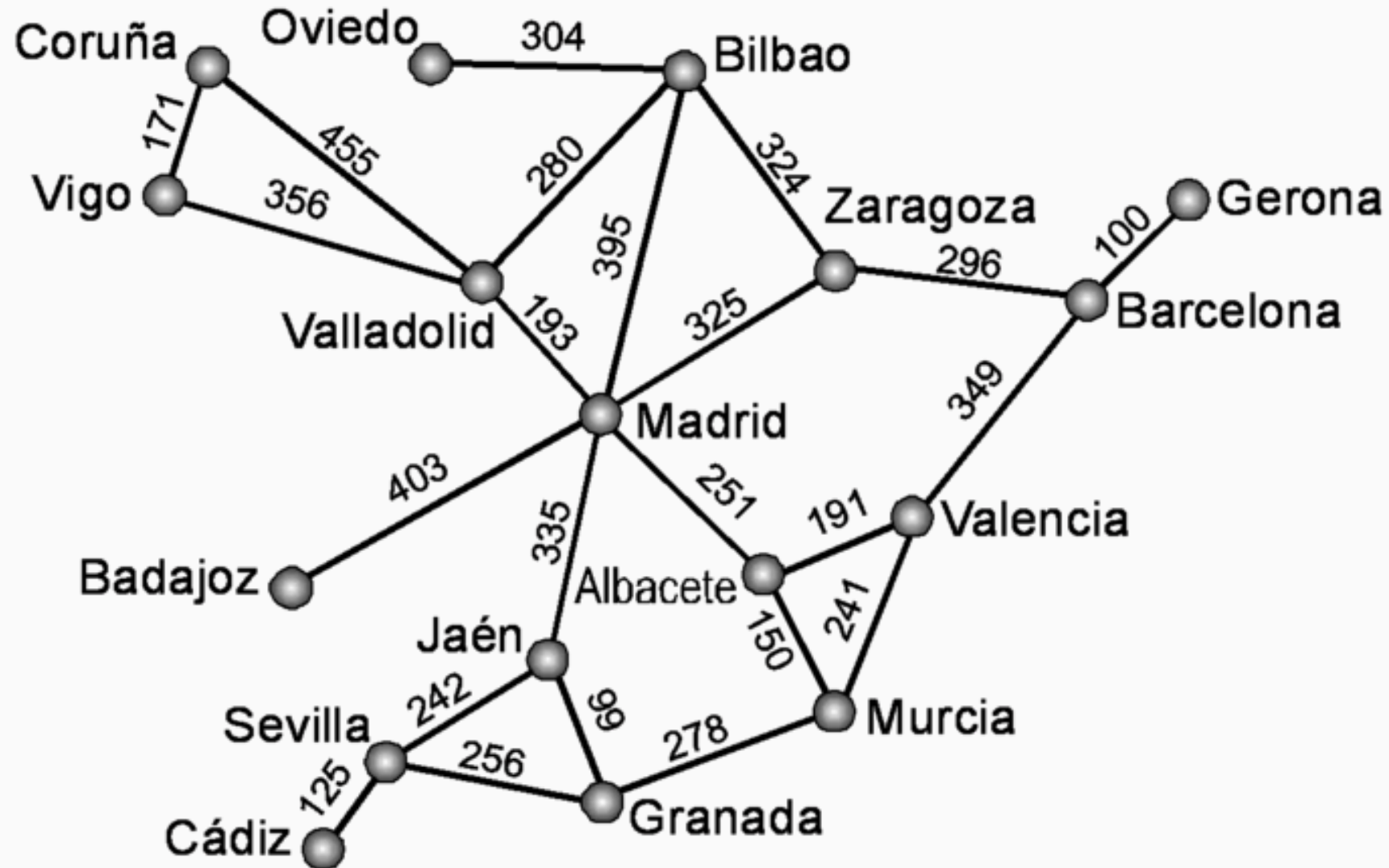
# Graph taxonomy

**Directed Graph**



Undirected

Directed

Image courtesy of Stoimen, http://www.stoimen.com

# Uses

Graphs arise in a great variety of problems and are an excellent way of synthesizing information.

# Geographical Relationships

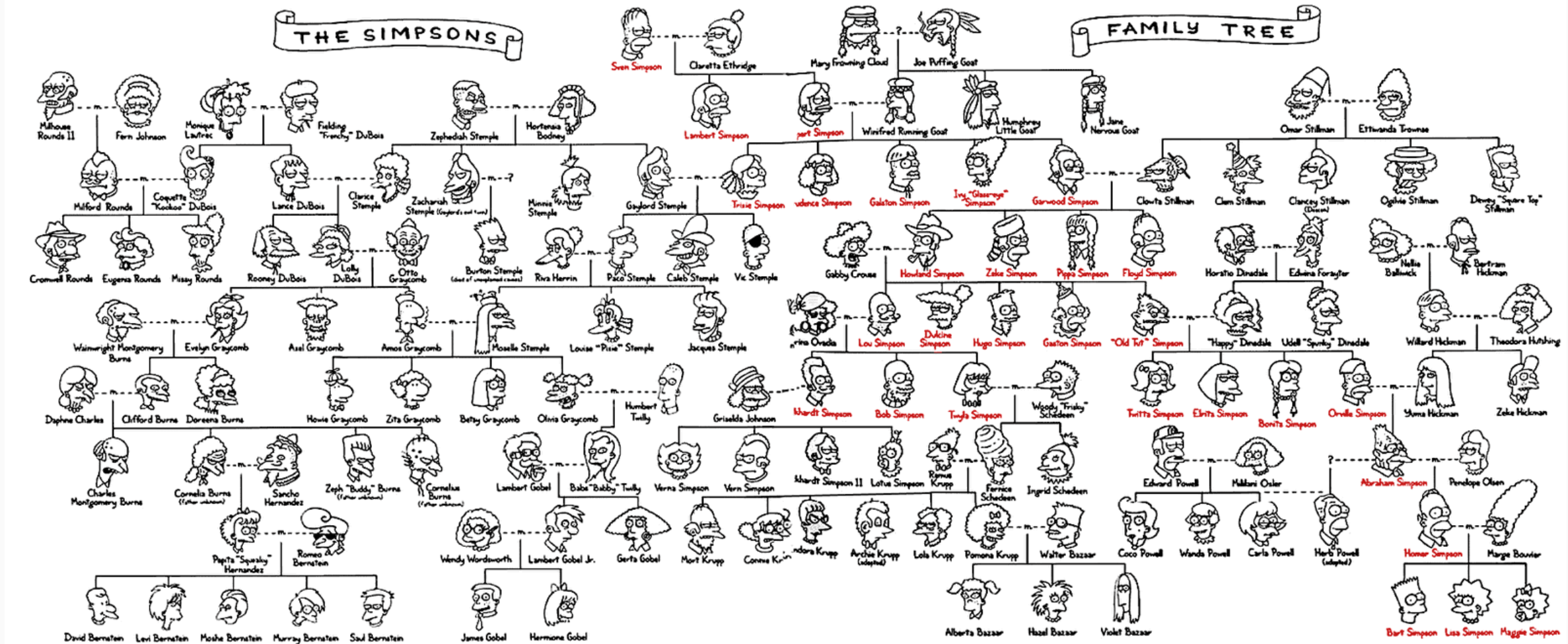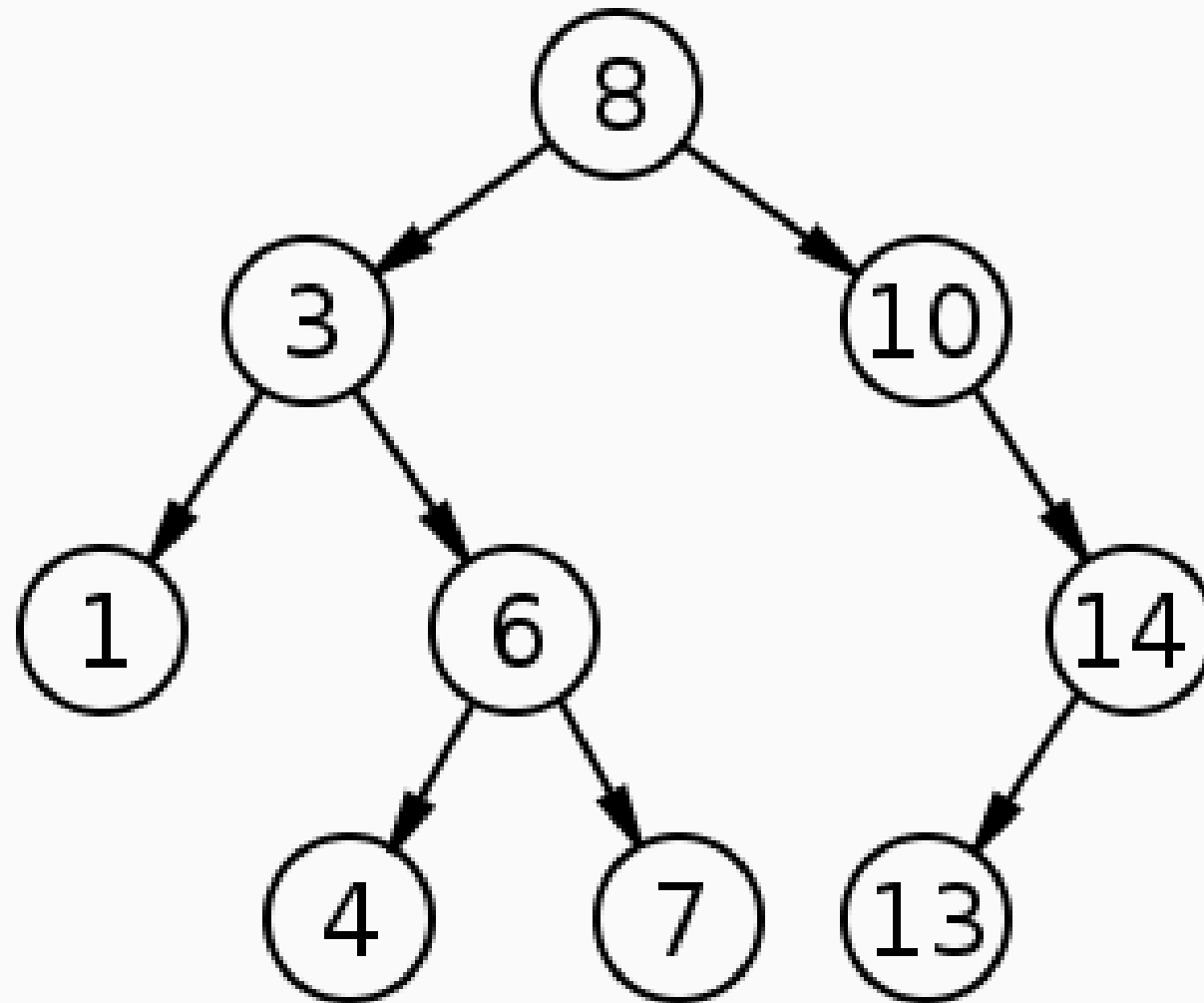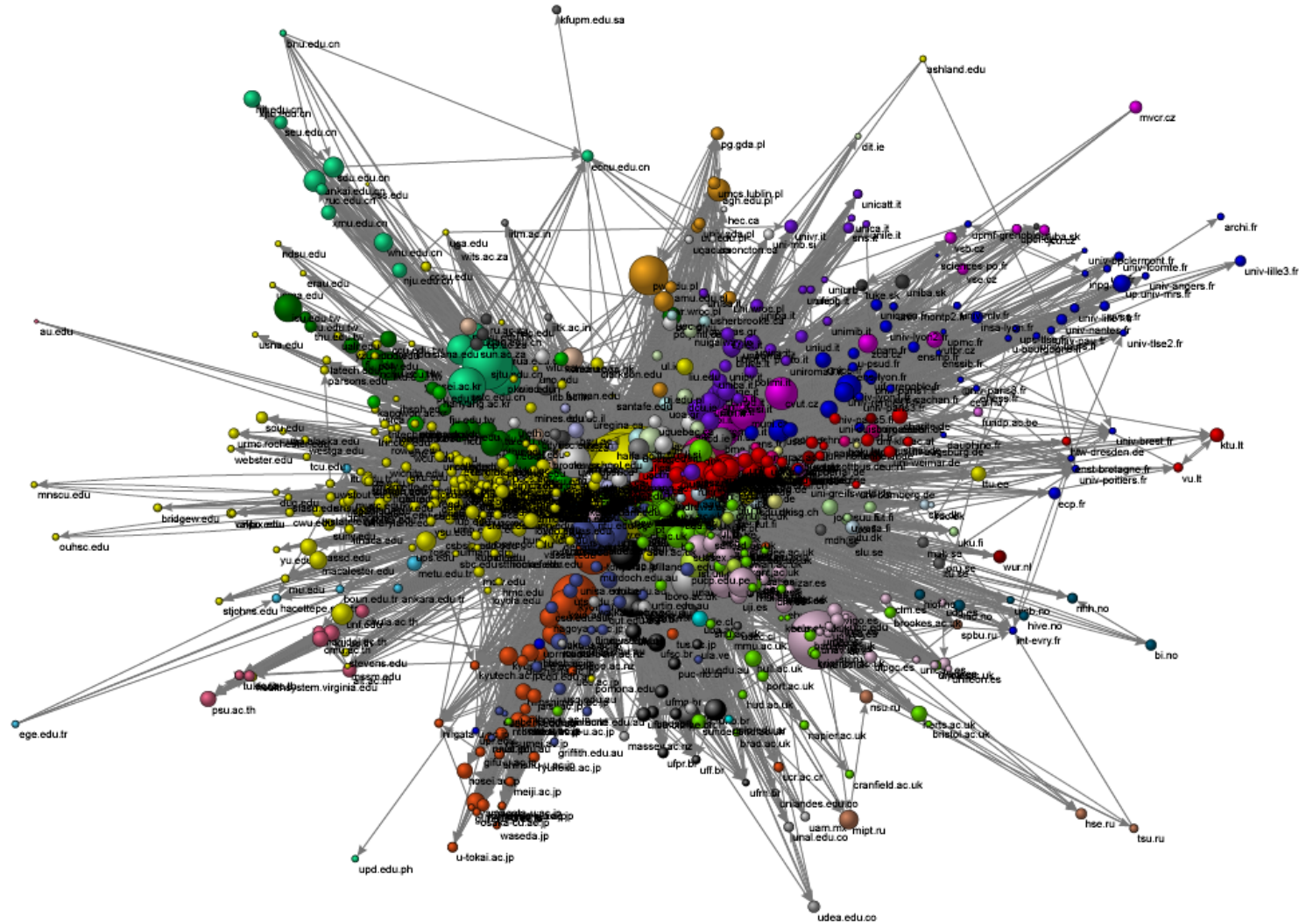# Maps

# Hierarchical relationships /Trees

# Hierarchical relationships /Binary Trees

Wikipedia article name surrounded by regular phrases
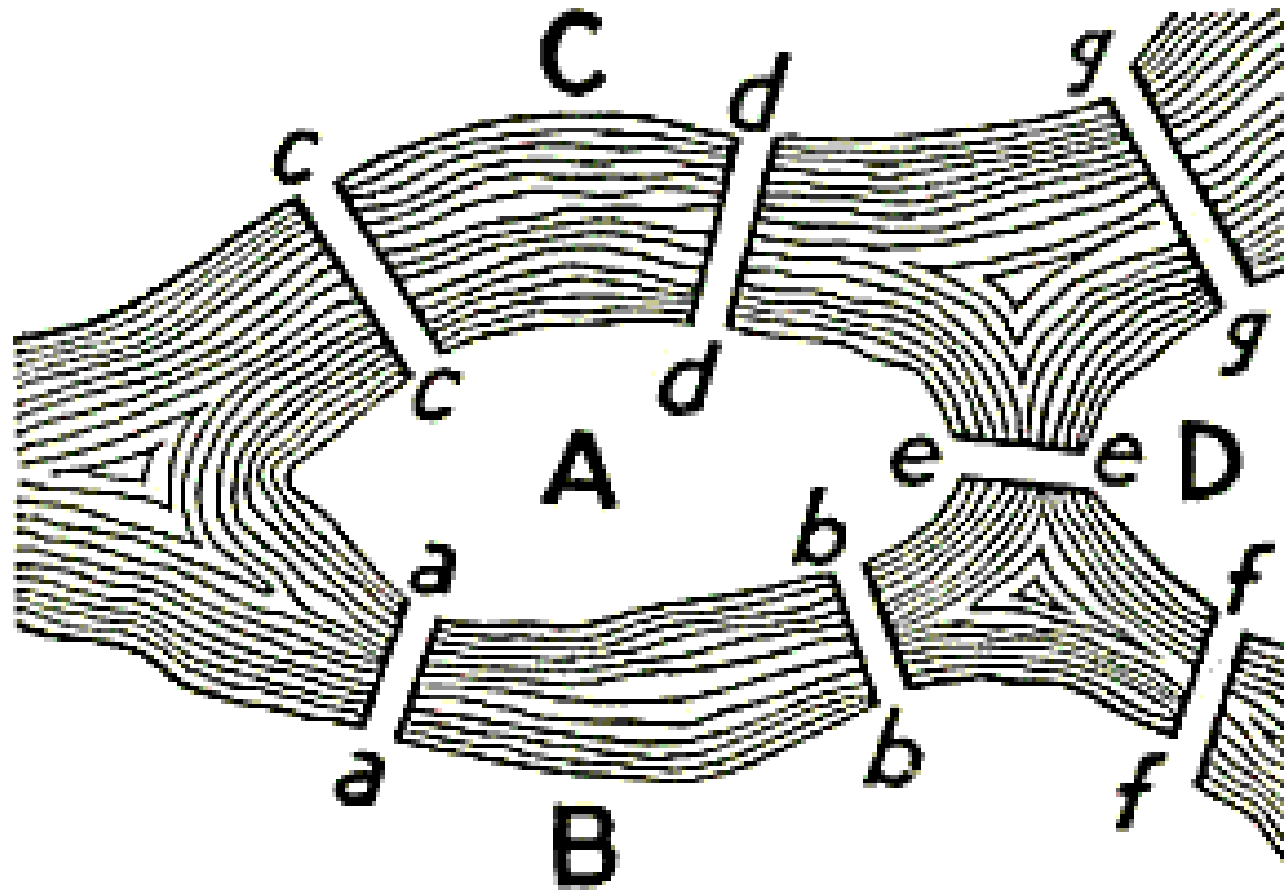that are shared by the content of many different articles [1]

# Networks

# Bridges!



FIGURE 98. Geographic Map:
The Königsberg Bridges.

23