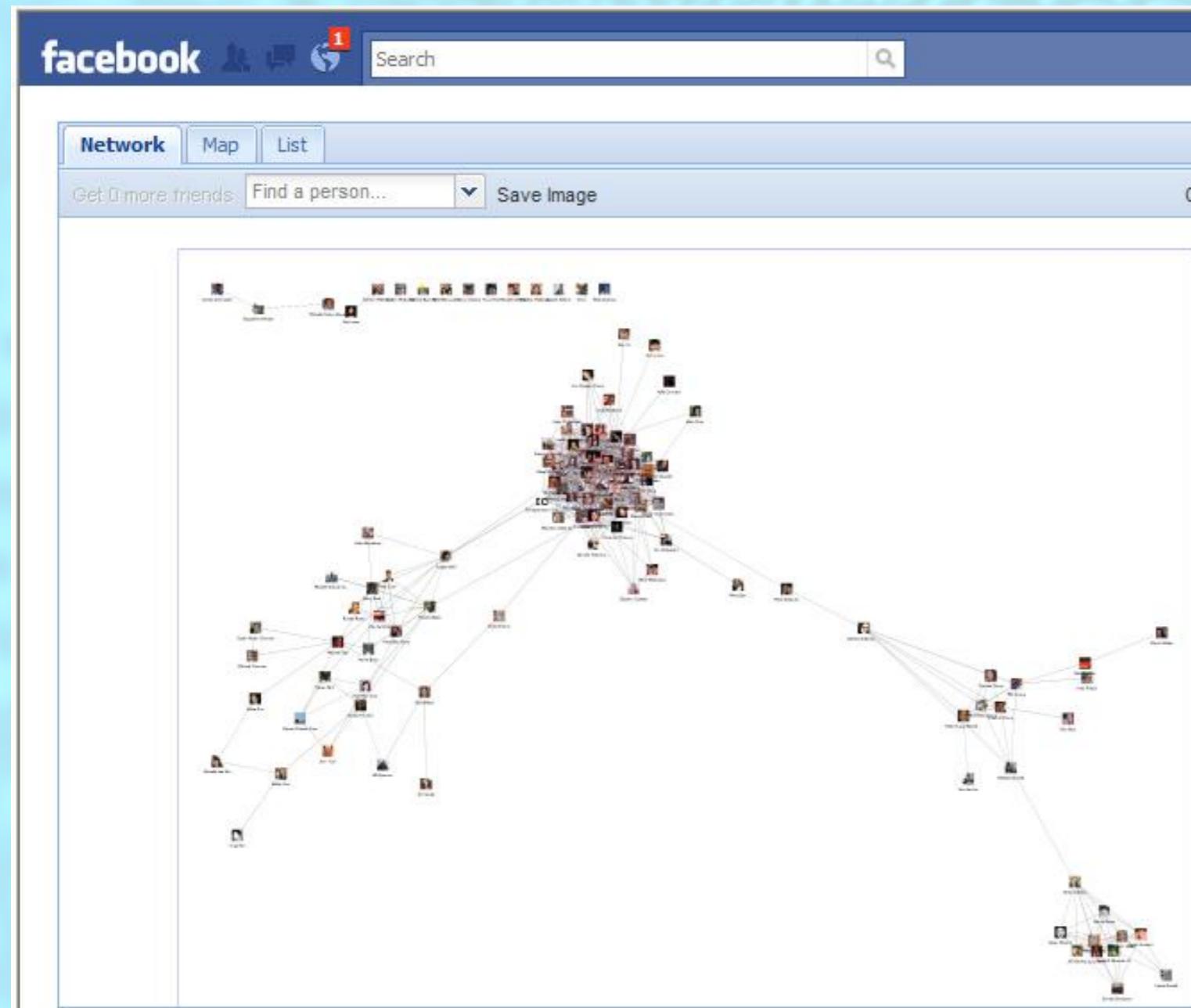




DATA Analysis con PYTHON

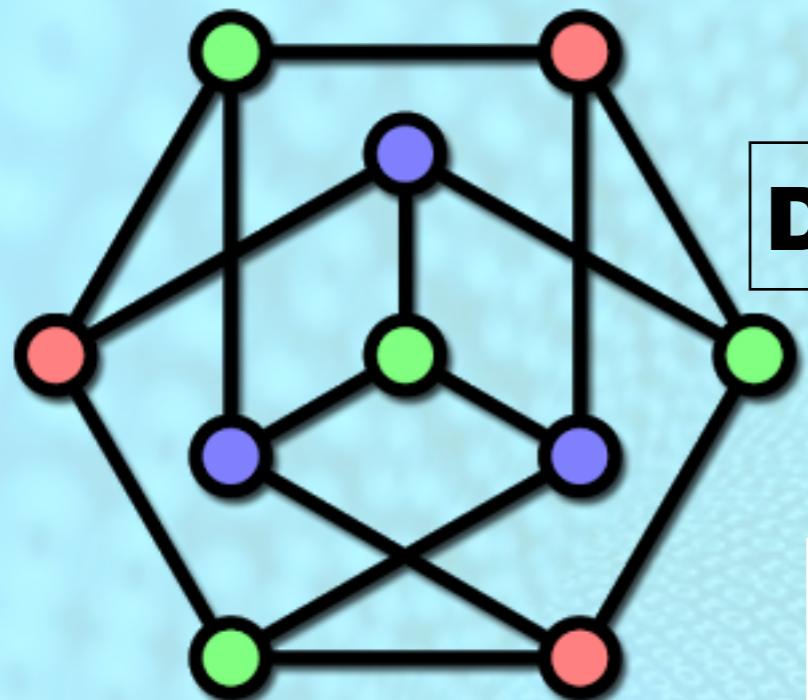


Network analysis



A network is a system of interconnected objects

CNA (Complex Network Analysis) is a discipline of exploring quantitative relationships in the network



Graph Theory

Dated between end 1800- early 1900

A VERY BRIEF *graph theory*

INTRODUCTION TO

→ Graphs are a way to formally represent a network, or a collection of interconnected objects.

→ In mathematics, graphs are defined as ordered pairs, with two parts: vertices + edges.

So, what's the definition of a graph?

it looks like this.

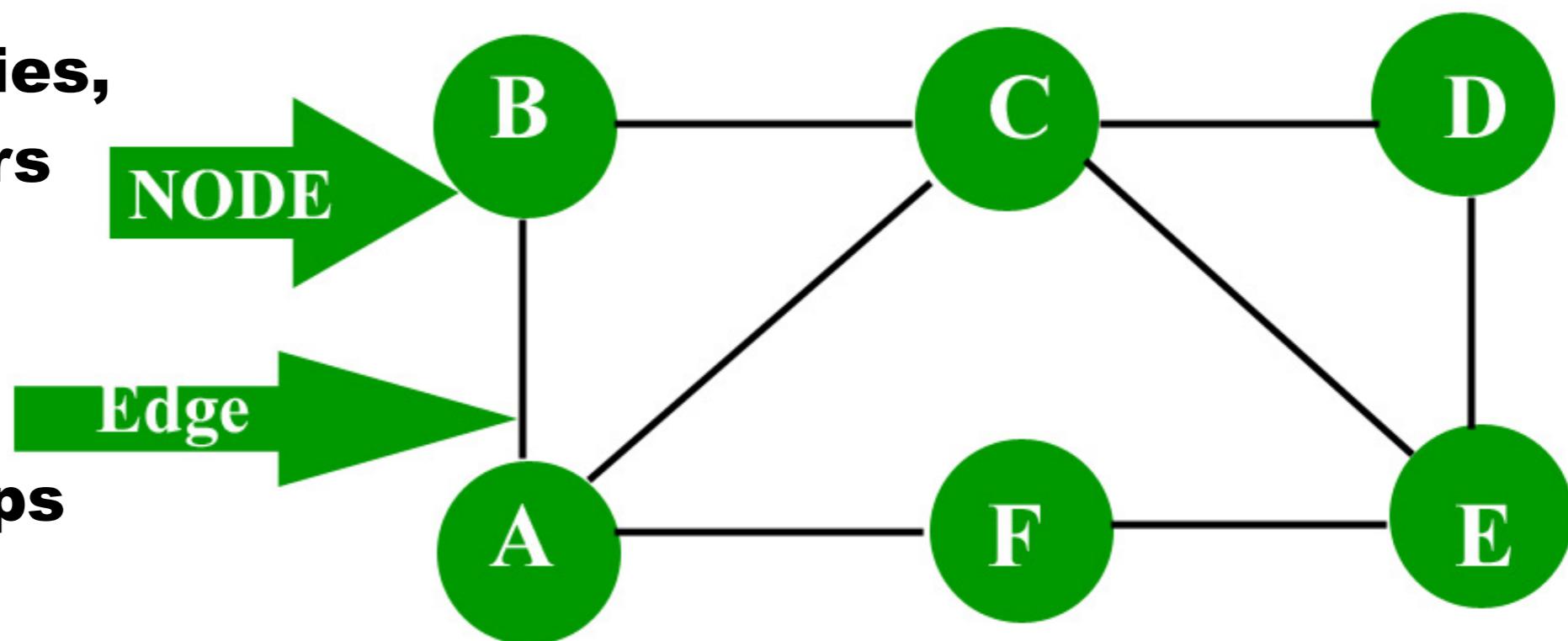
$G = (V, E)$ where **V** is a set of nodes, also called vertices and **E** is a set of edges, also called links.

A small diagram of a graph with 6 nodes and 9 edges, forming a cycle with some internal connections.

Relational form of representing data

The entities,
or actors

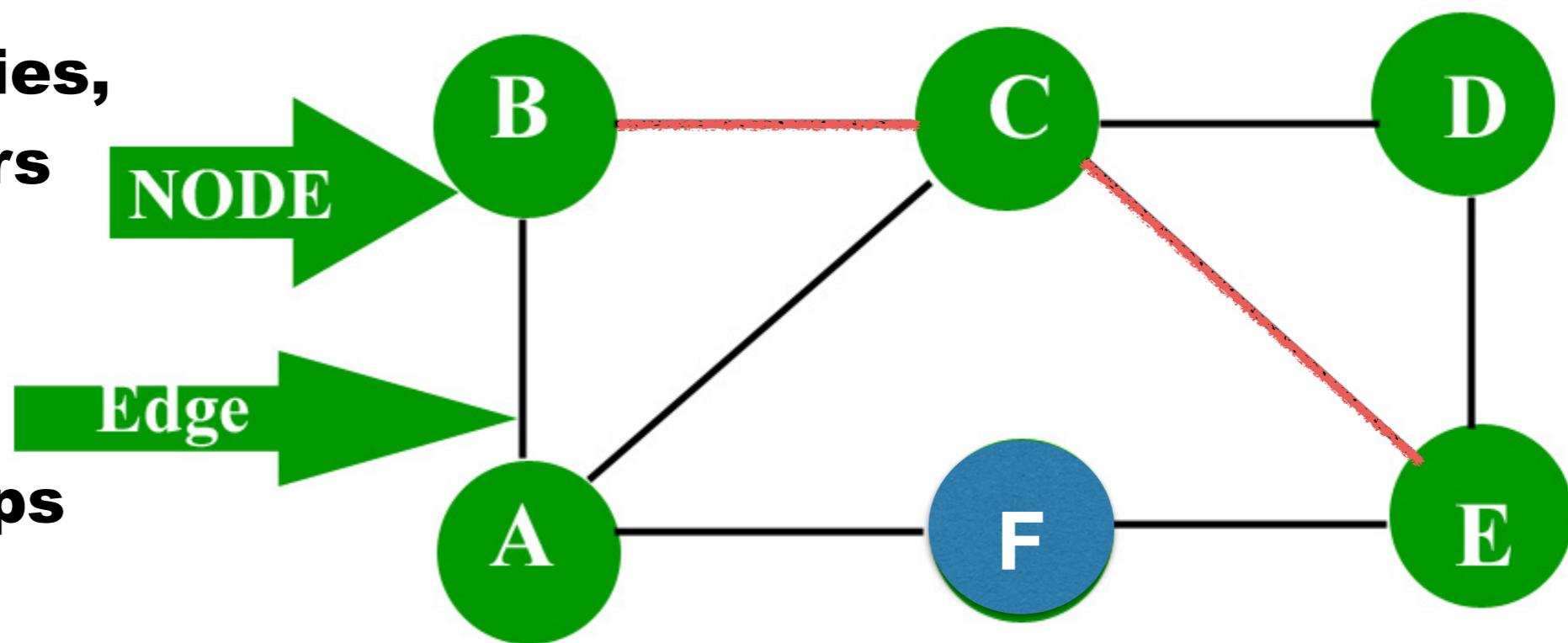
Relationships



Relational form of representing data

The entities,
or actors

Relationships

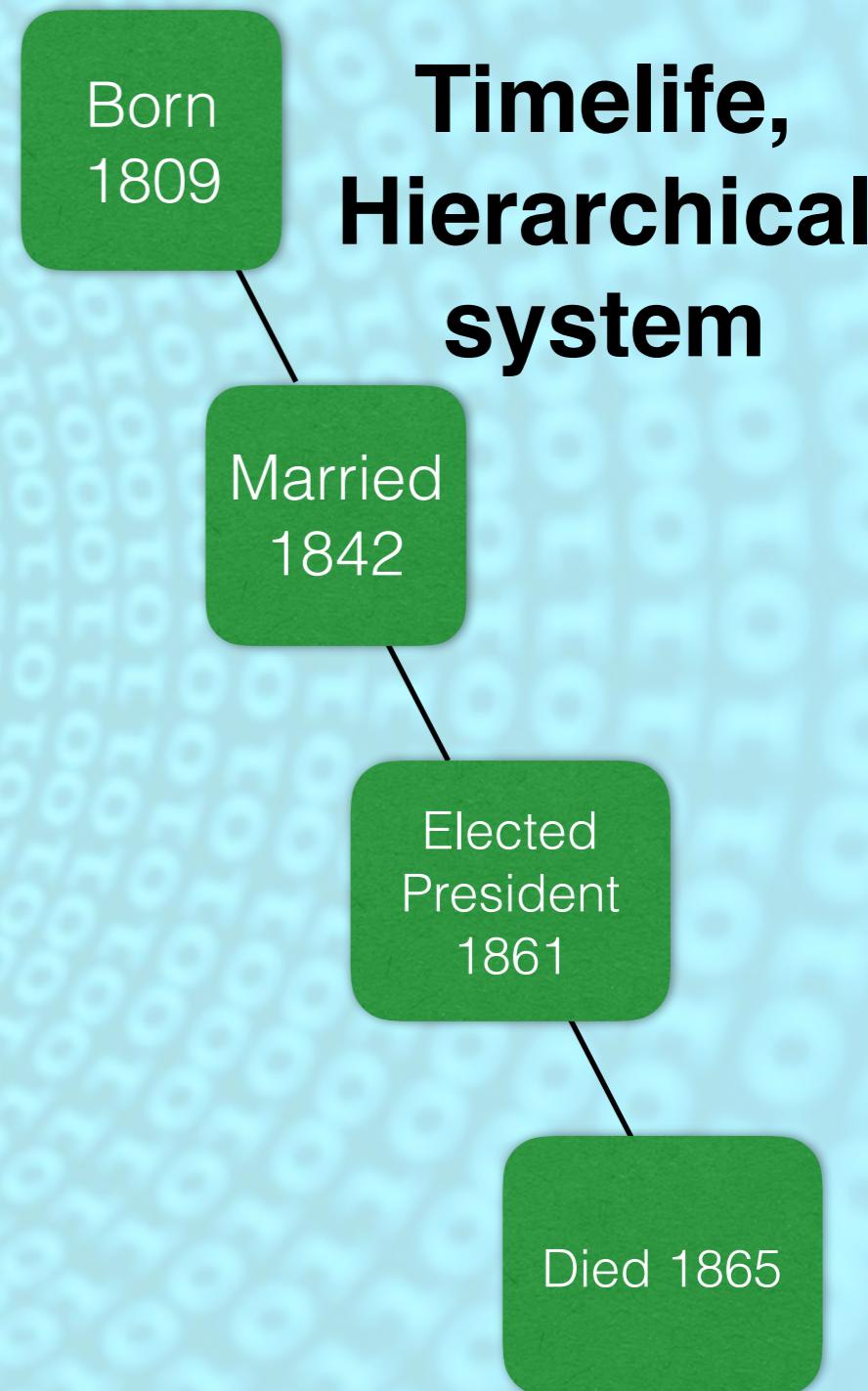


Fundamental types of Networks

Simple Networks

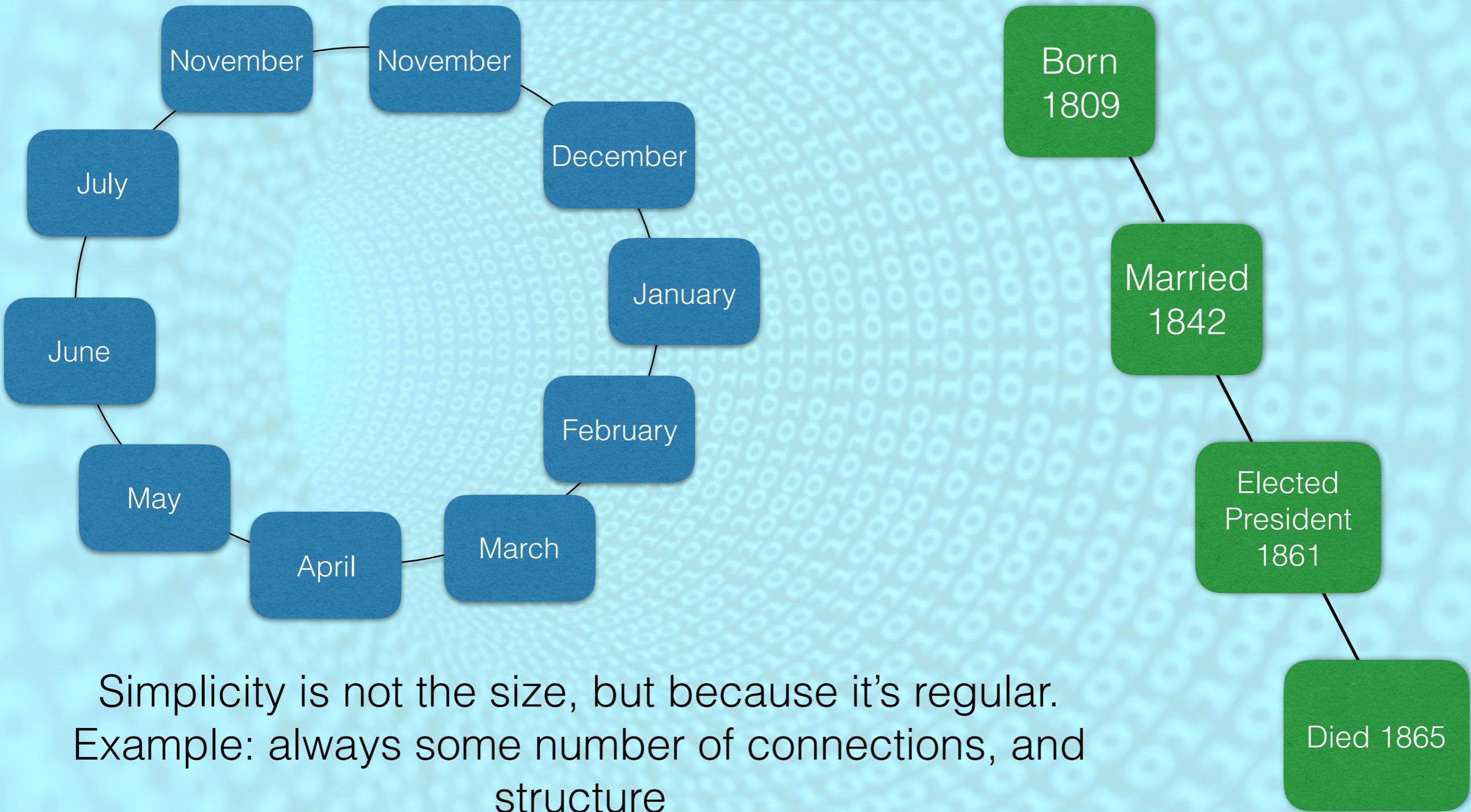


Ring of a restaurant working months



Fundamental types of Networks

Simple Networks



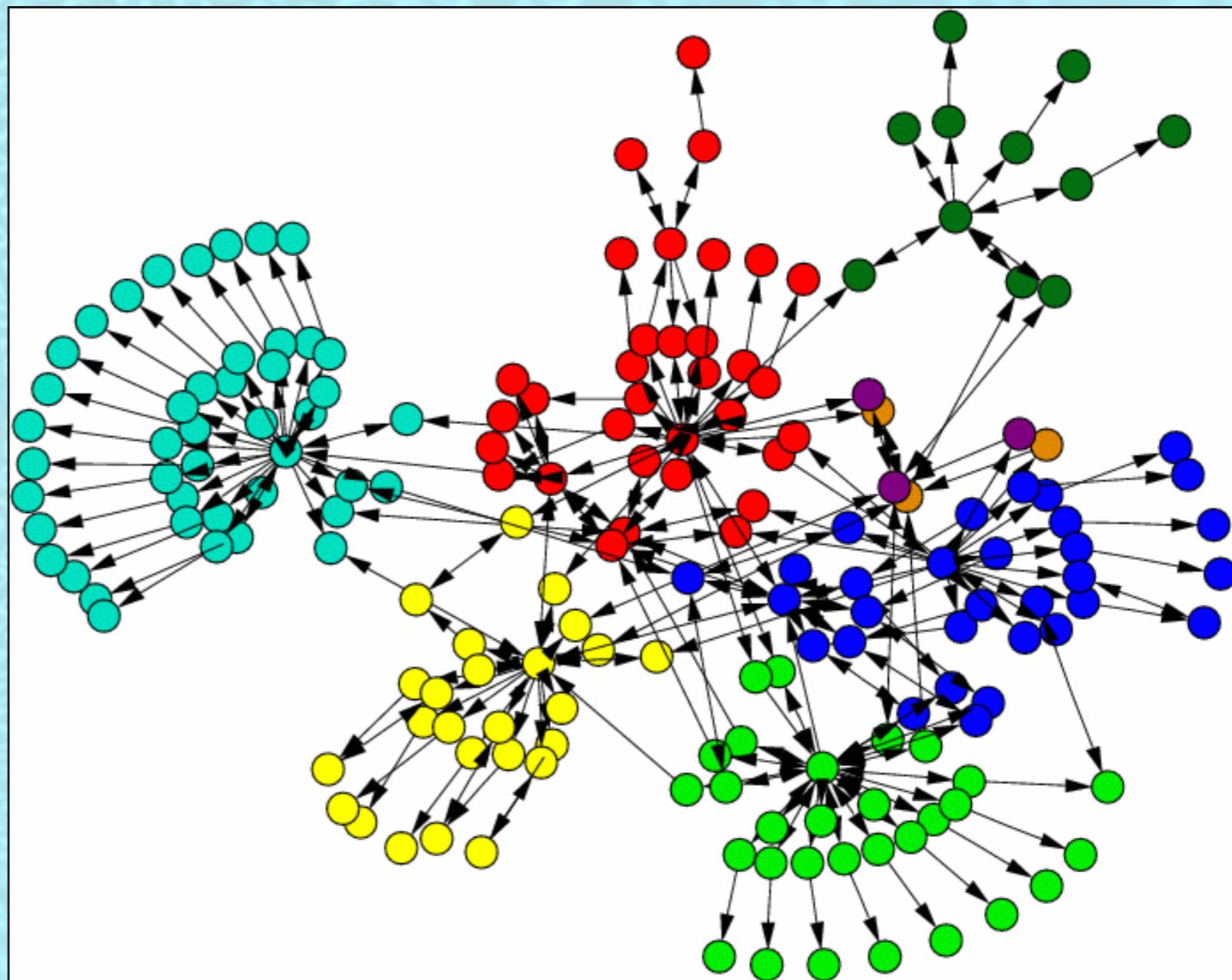
Simplicity is not the size, but because it's regular.
Example: always some number of connections, and structure

Fundamental types of Networks

Complex Networks

Do not have a trivial structure.

It's not a grid, a tree or a ring. But it's not random.



Fundamental types of Networks

Complex Networks

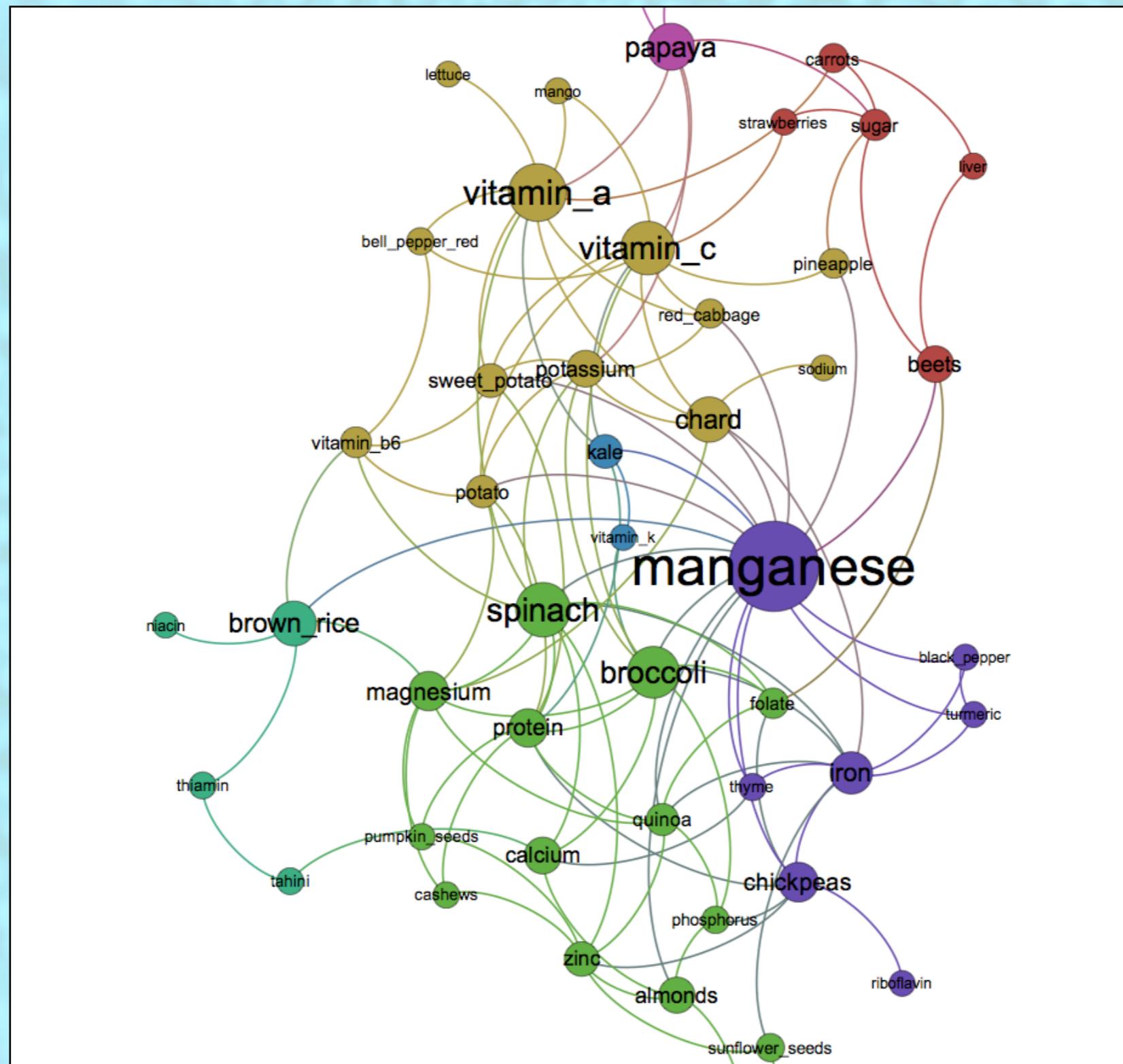
Examples

Technological networks
(internet, electric grid, water mains)

Economic networks
(Financial transitions, international trade, market basket analysis)

Social networks
(email exchange, groups, friends)

Cultural networks
(literature, art, history, language families)



Python- LIBRARIES

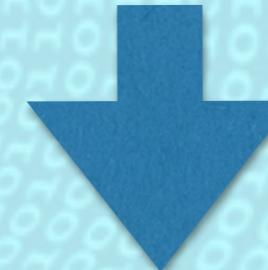
NetworkX

IGraph

Networkkit

Graph-tool

Manipulate, construct, visualise, analyse the networks.



**Convert the results into non-network data structures
(like Pandas DataFrames)**

Python- LIBRARIES

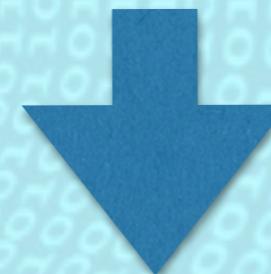
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