Financial Network Analysis using Python

CONF42

KALYAN PRASAD

About me!

Self Taught Data Scientist & Analytics Manager

Community First Person

PyCon India, PyConfHyd, HydPy & HFAI

Avid Speaker/Mentor

Itskpflow

Kalyan Prasad

Outline

- History & Graphs

- Introduction to Networks

- Network structure

- Finance evolution in Networks

- Power of Python graphs

- Action

- References

History & Graphs

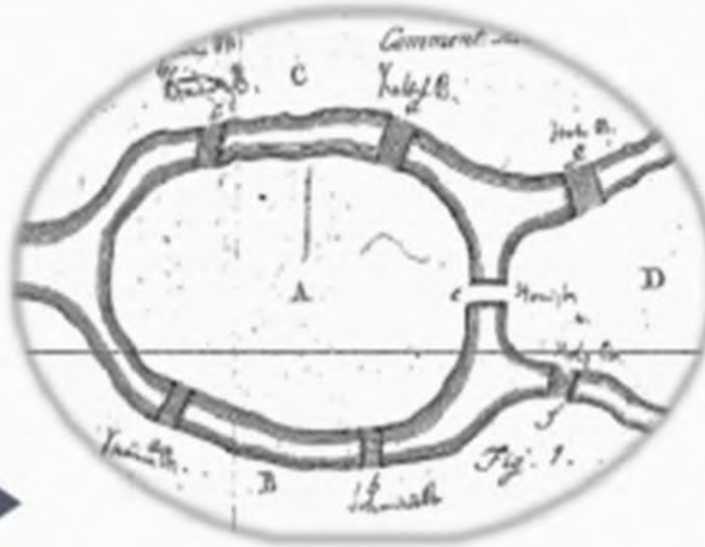Graphs were first introduced in the 18th century by swiss mathematician **"Leonhard Euler"**
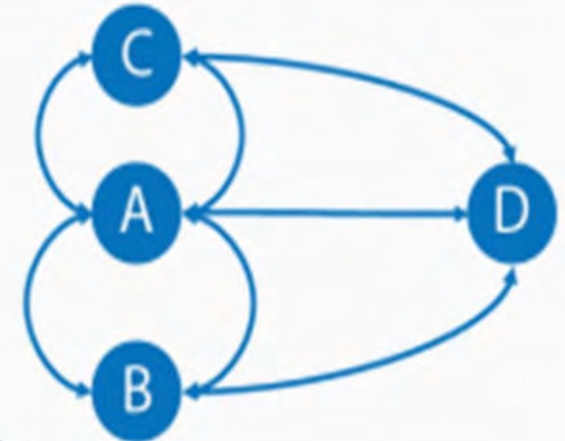
History & Graphs

Walking the Bridges of Königsberg
4 Main areas of Königsberg with 7 Bridges. Can you cross each bridge only once and return to your starting point?

Euler's Insight
The only relevant data is the main areas and the bridges *connecting* them.

Origins of Graph Theory
Euler abstracted the problem and created generalized rules based on nodes and relationships that apply to any connected system.

Introduction to Networks

- Network data are generated when we consider relationships between two or more entities in the data

- It has been extensively studied in graph theory, an area of mathematics

- In a nutshell, a network is a system with nodes connected by linkages

- Each node and edge can hold specific properties which describe its characteristics
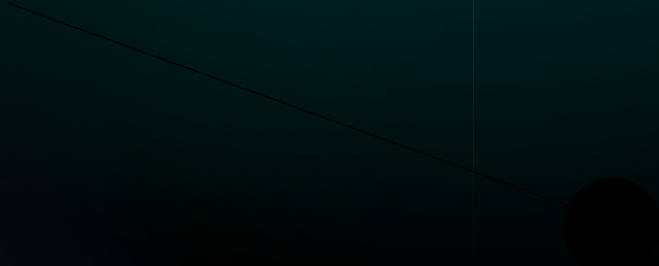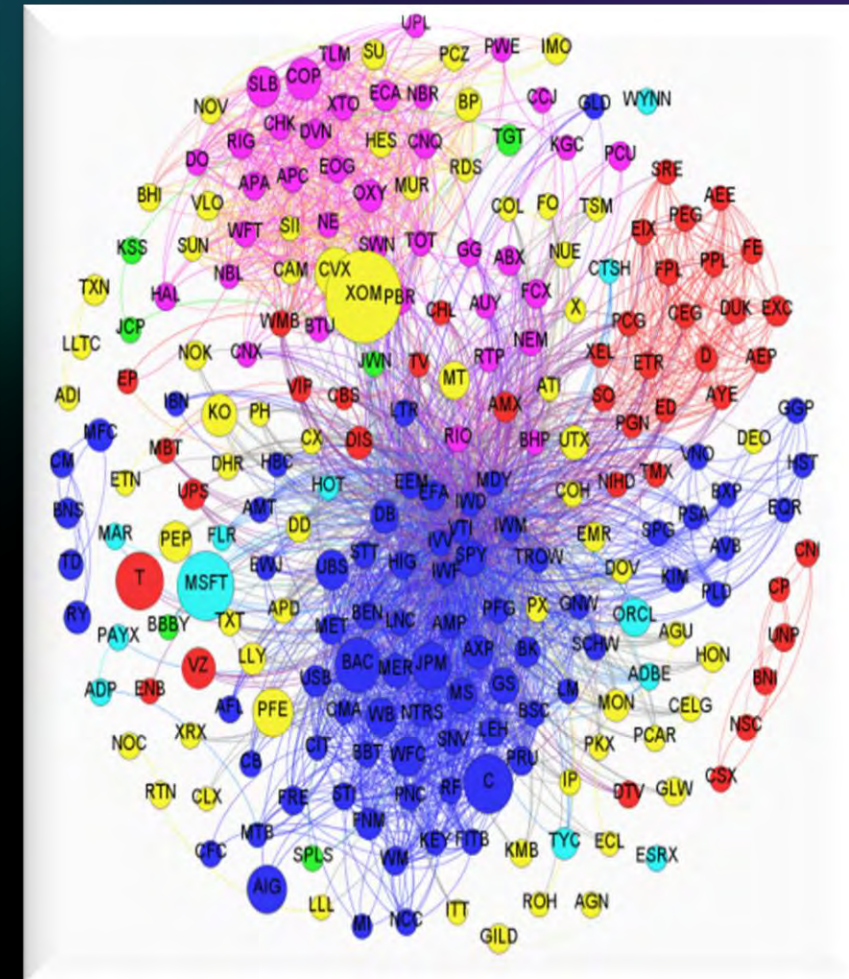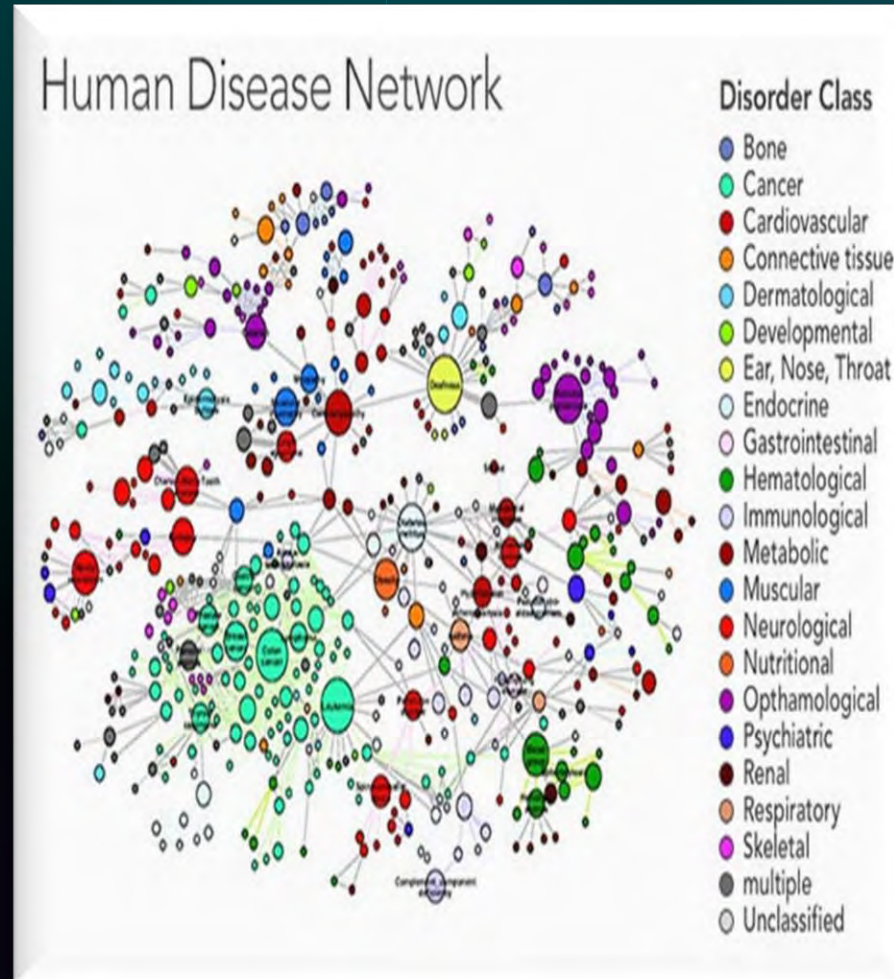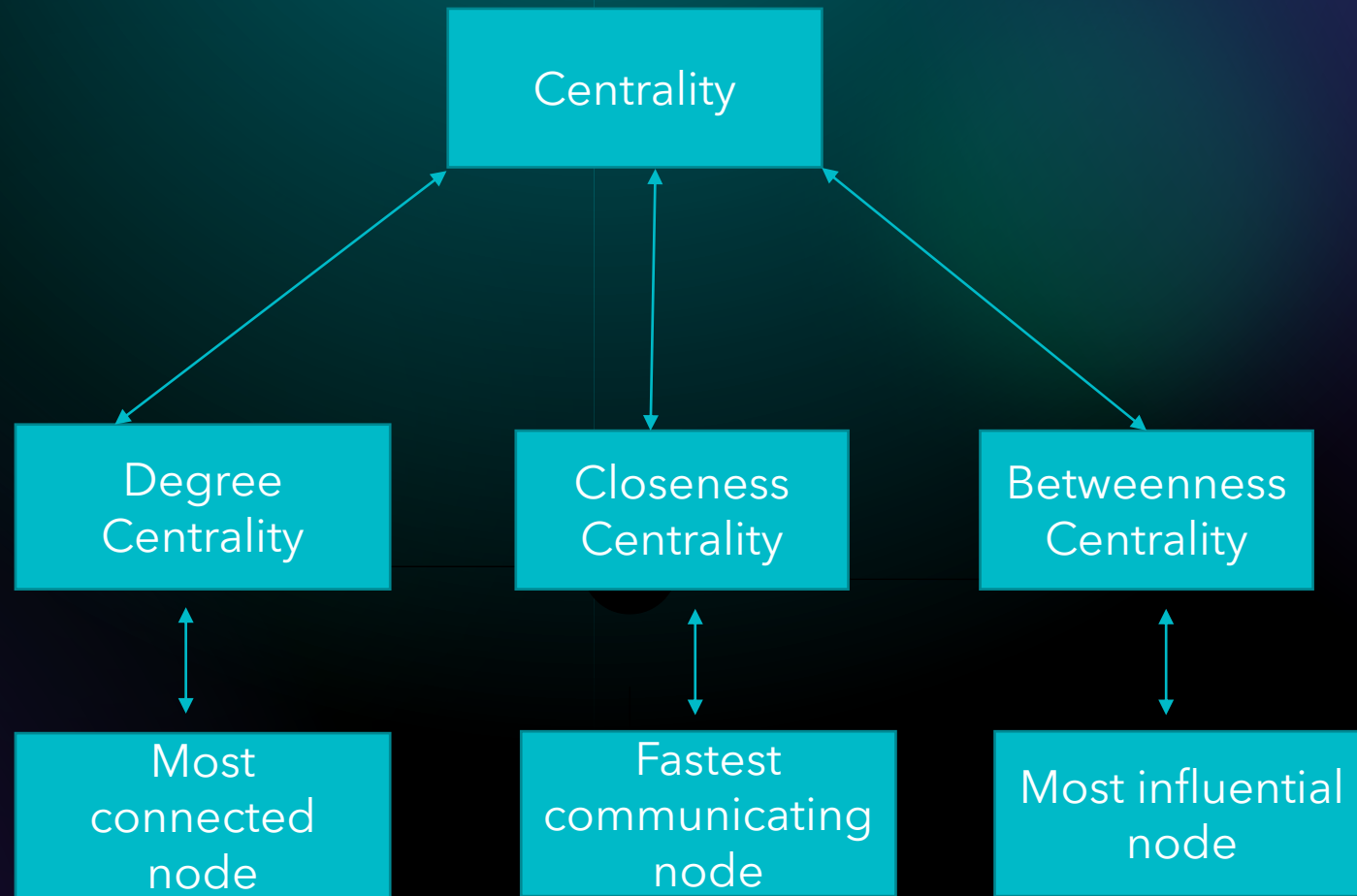
Network Structure
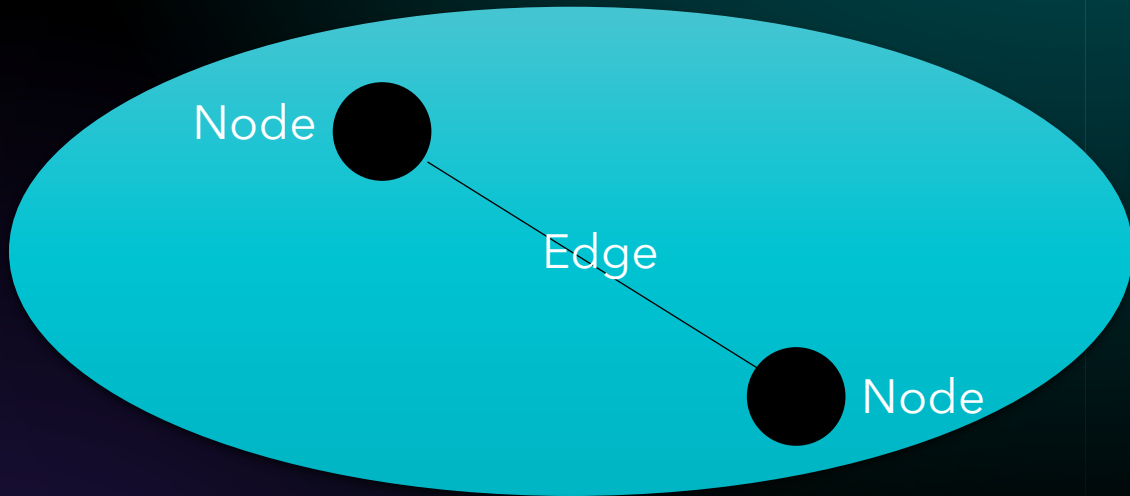
Examples

Social Networks

Biological Networks
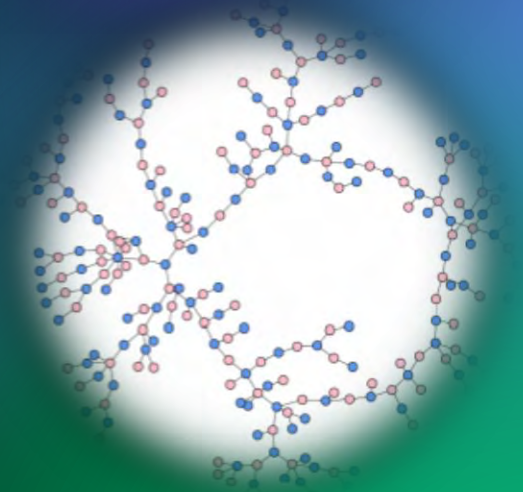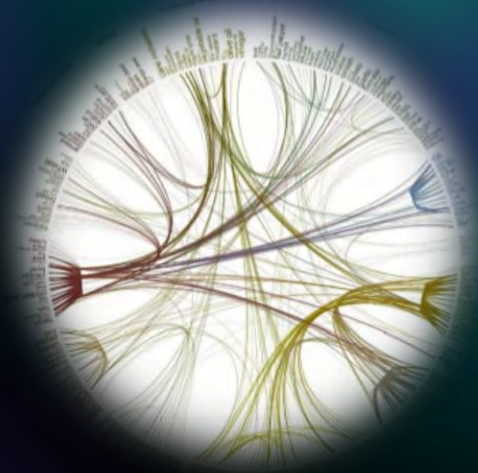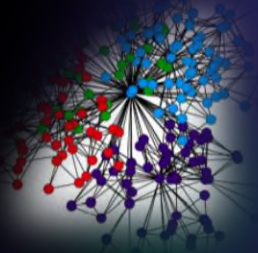
Finance Networks

Indicators

Finance Evolution in Networks

- Financial networks have been on the research agenda since the financial crisis of 2008

- Network analysis has become an active topic not only in data science but also in finance

- There are some major areas of interest and applications for the study of financial networks. For example- Interbank networks, stock correlation networks, agent-based models etc..

- Several studies have proposed network-based models for studying the stock correlation network

- Stock correlation network has proven its efficacy in predicting market movements

Power of Python Graphs

- How can we analyse all these networks?

- Python + NetworkX

References

- Introduction to Graph Theory

- Data Science for Economics and Finance

- https://networkx.org/

Questions?