

Introduction to Network Analysis

Dr. Tom R. Leppard

Supported by The National Science Foundation - 2222148

1: Install R

RStudio requires R 3.6.0+. Choose a version of R that matches your computer's operating system.

R is not a Posit product. By clicking on the link below to download and install R, you are leaving the Posit website. Posit disclaims any obligations and all liability with respect to R and the R website.

DOWNLOAD AND INSTALL R

2: Install RStudio

DOWNLOAD RSTUDIO DESKTOP FOR WINDOWS

Size: 287.97 MB | [SHA-256: 8CE88C63](#) | Version: 2025.09.0+387 | Released: 2025-09-12

R and R Studio – Download NOW

<https://posit.co/download/rstudio-desktop/>

Let's Meet

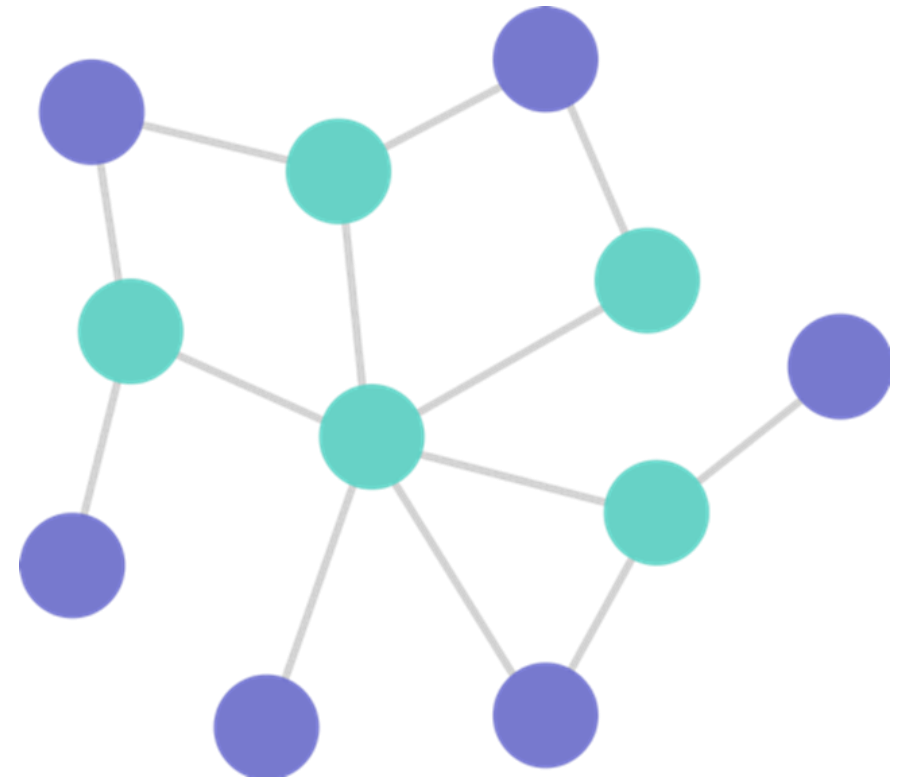
What are Networks? What is Network Analysis?

- A system with individual interacting parts
- A visual representation of a system or group of people
 - Social, transportation, neural, epidemiological, cellular, commercial (travel/trade).
- A process of analysing individuals, groups, and/or systems using graph theory
 - Analyse observed, latent, and structural social processes.
- Building statistical models to explain why interactions occur, information spreads, or the prominence of people.

Network Components

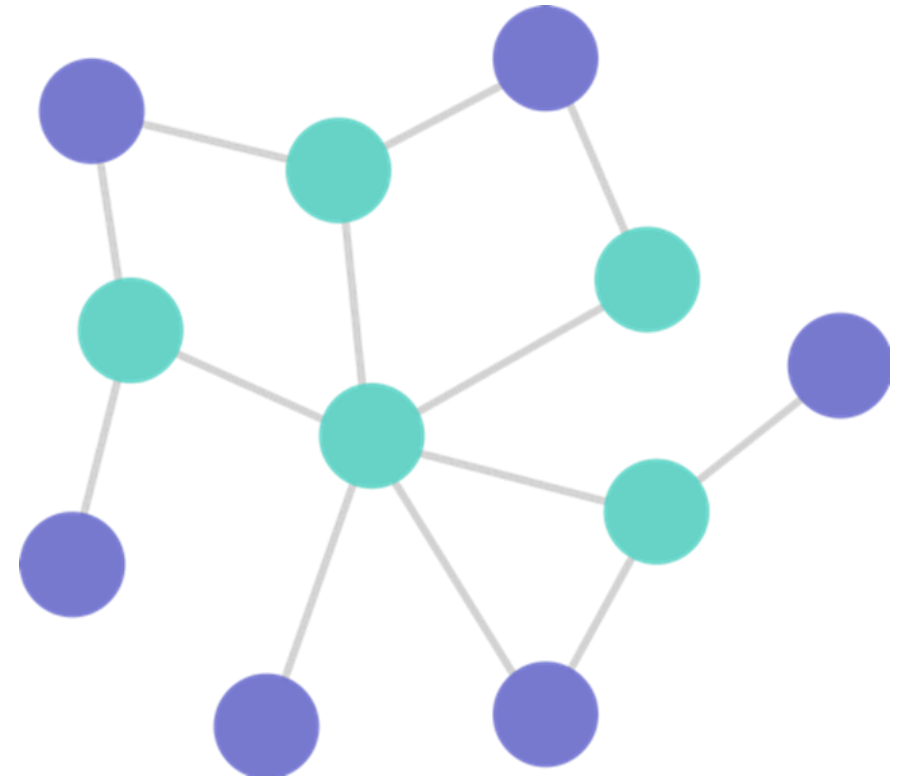
Components - Nodes

- The nodes are the actors of a network.
 - People, groups, organizations, states, words, sentences, books, etc.
- The nodes in the figure are represented by the purple and green dots.

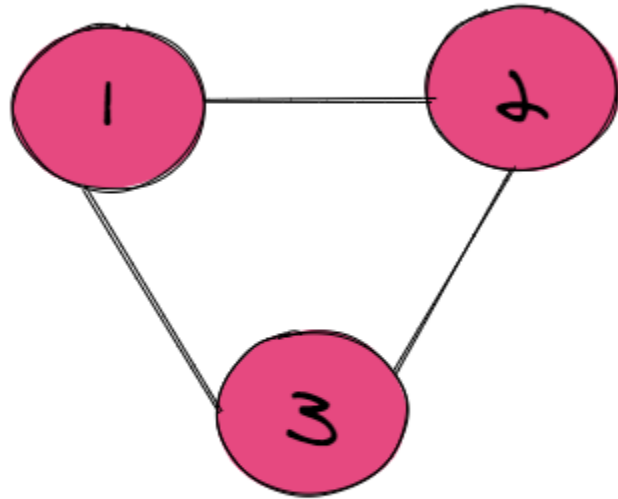


Components - Edges

- Edges are the connections in the network.
 - Kinship, affiliation, interaction, and affective relationships, etc.
- The edges are represented in the figure by the gray lines linking each node to another.



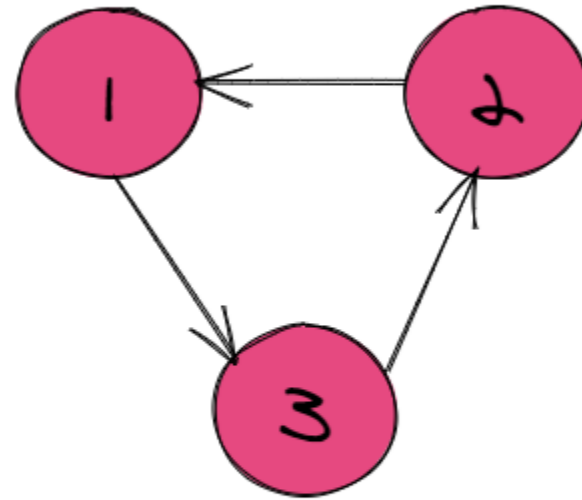
Undirected graph



Vertices = $\{1, 2, 3\}$

Edges = $\{ \{1, 2\}, \{2, 3\}, \{3, 1\} \}$

Directed graph



Vertices = $\{1, 2, 3\}$

Edges = $\{ \{2, 1\}, \{1, 3\}, \{3, 2\} \}$

GO TO RSTUDIO

BE FREE 😊