3. Descriptive Network Statistics

Introduction to Social Network Analysis in R

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Descriptive Network Statistics (Metrics)

Introduction to Social Network Analysis(SNA) in R

1. Introduction to basic concepts in SNA
2. Visualization of networks.
3. Metrics - Individual nodes.
4. Metrics - Whole network.
5. Project.

Descriptive Network Statistics (Metrics)

Descriptive Network Statistics (Metrics)

Connectedness

Which node is most important?

- Degree - number of edges a node is involved in.
- In Degree = number of incoming edges
- Out Degree = number of outgoing edges

Density

Proportion of actual edges out of possible edges.

how connected is the network overall

Reciprocity

Definition:

- Dyad : pair of vertices
- Reciprocal edge: a dyad for which connection goes both ways

Reciprocity

Two types

- Number of reciprocal edges over the total number of edges
- Number of reciprocal edges over the number of dyads with only one unreciprocated edge

Indication of connectivity

Dyad Census

In directed graphs, **dyads** can be:

- Null: no edge between the pair.
- Asymmetric: one directed edge.
- Mutual: two directed edges.

Indication of hierarchical structure

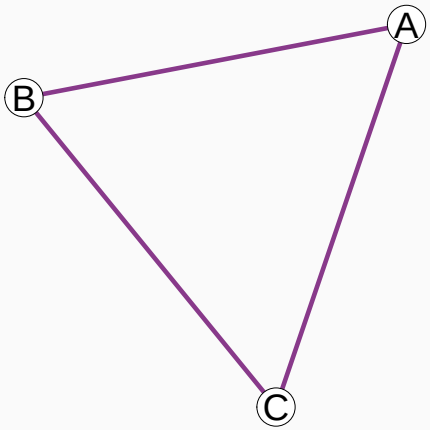
Transitivity (clustering coefficient)

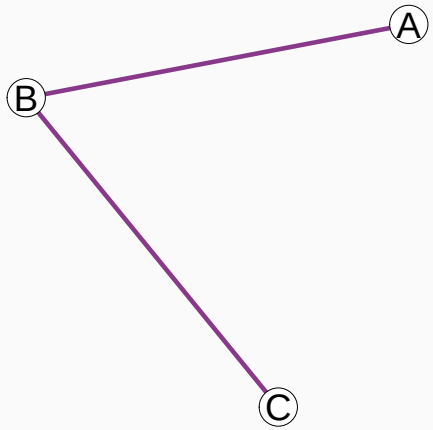
Fraction of transitive triplets

Definition:

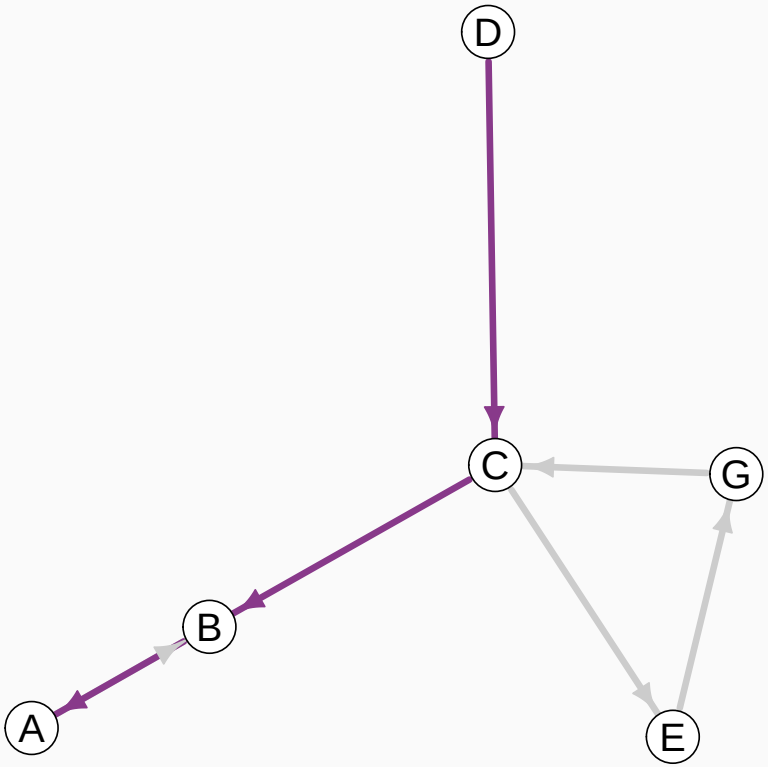
- Triad/triplet : set of three vertices

Transitive triplet and **Intransitive triplet**

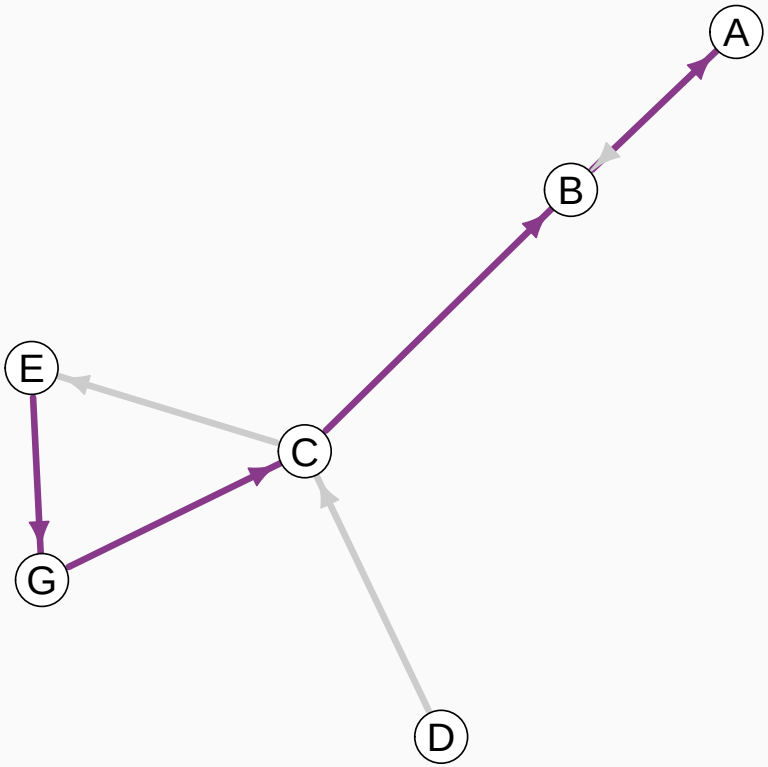




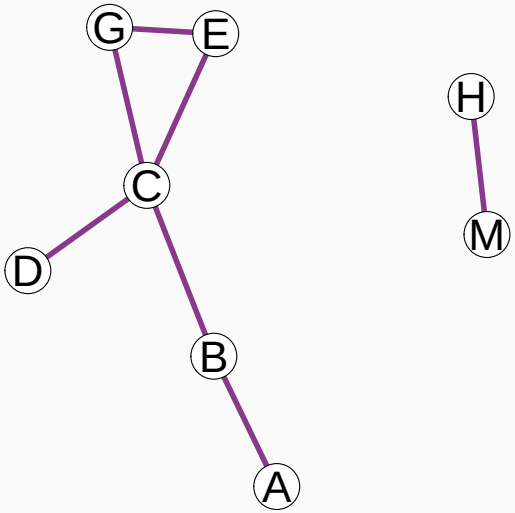
Reachability - Average path length

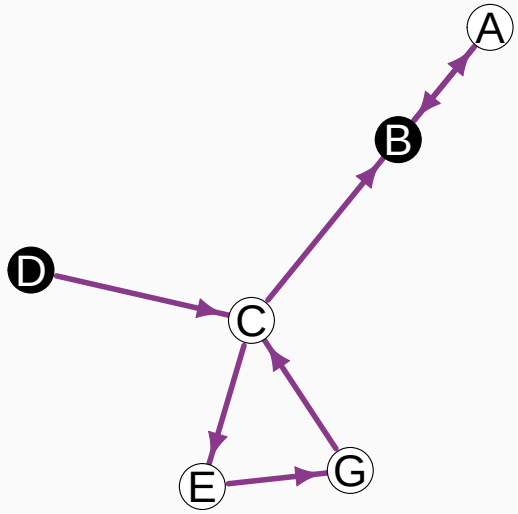


Diameter



Connected components

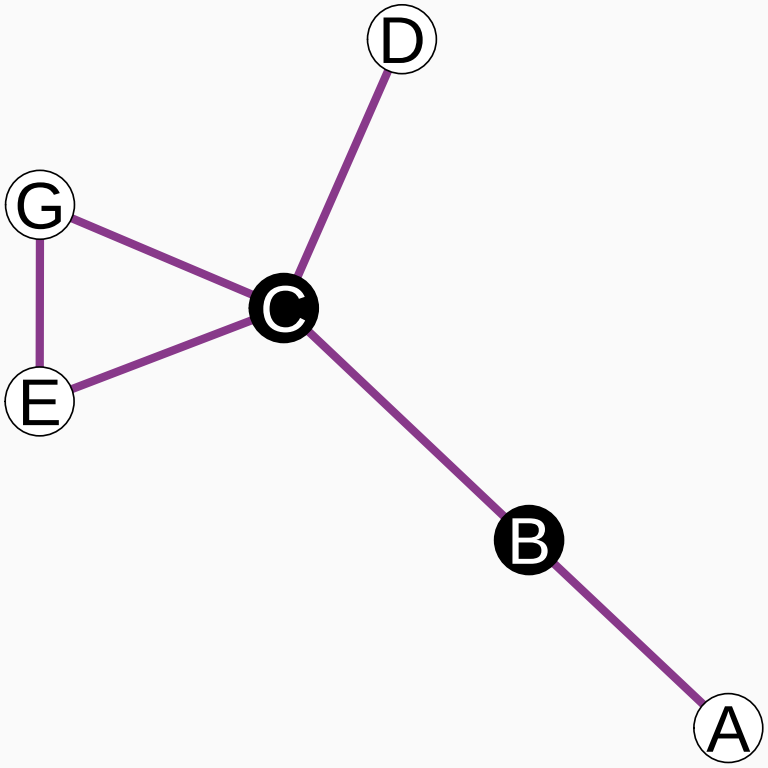




Strongly connected component and Weakly connected components

Articulation points

Nodes that if removed would break the network into more components.



Let's try these!

3_WA_NetworkMetrics.Rmd

Summary:

Today we looked at

1. Descriptive Network Statistics (*Metrics - Individual and Whole Network*)

Next session:

1. Some more descriptive network statistics
2. Community detection
3. Project.