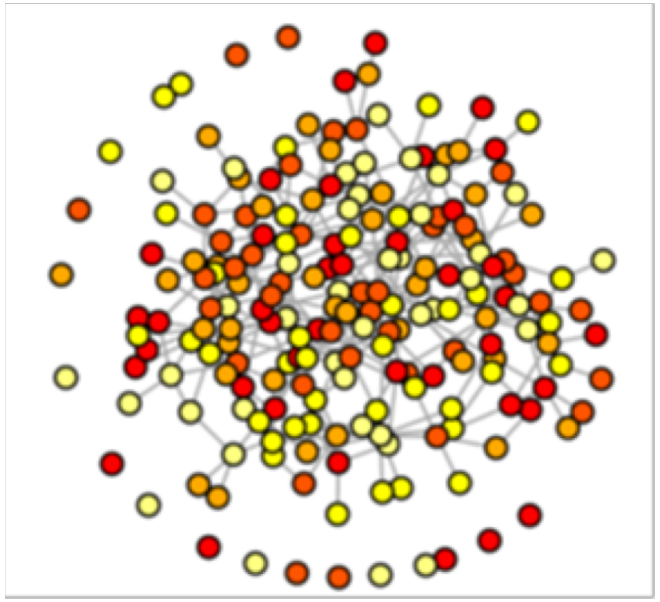
Networks in R



garrettlab.com

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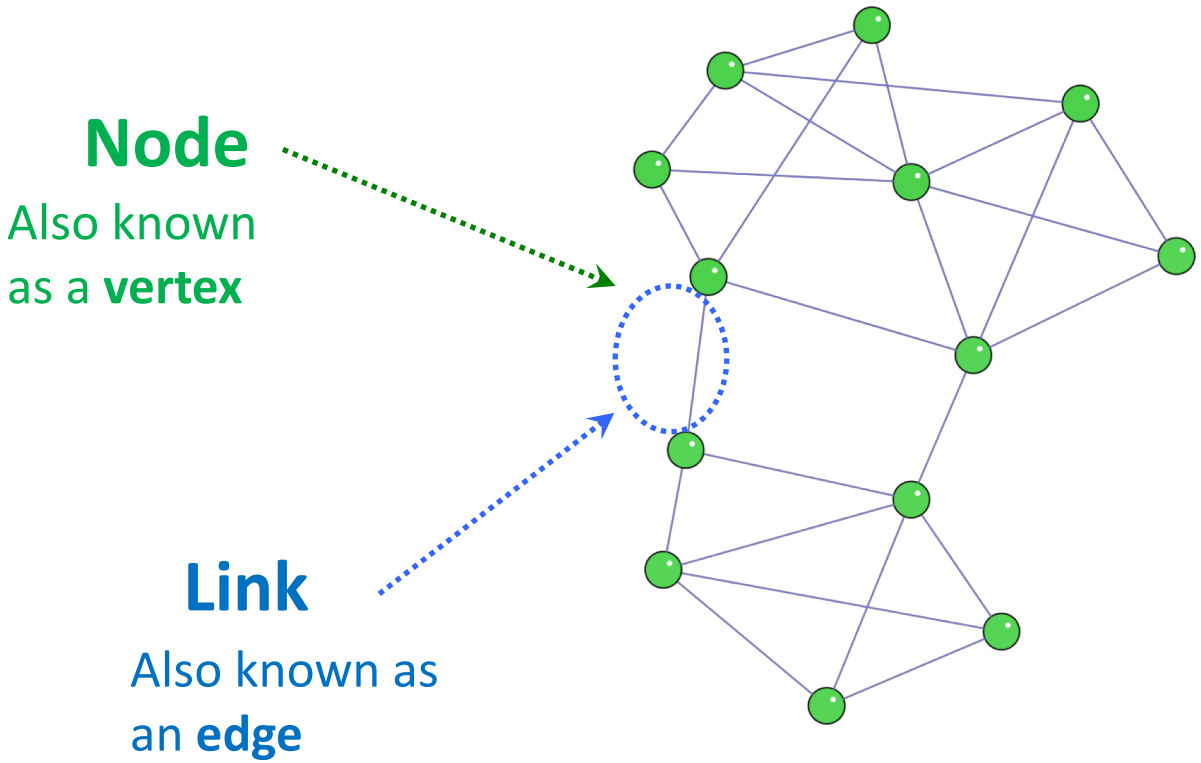
PLANT PATHOLOGY UF/IFAS

What is a network? Some key terms

- **Nodes**
- **Edges**

- **Dyads** – two nodes

- **Triads** – three nodes



A network is basically an adjacency matrix

- An adjacency matrix is a square matrix that describes a network, where each element of the matrix indicates whether a link exists between two nodes (and potentially also includes information about the weight associated with that link)

	To		
	N1	N2	N3
From			
Node1	0	1	1
Node2	0	0	0
Node3	1	0	0

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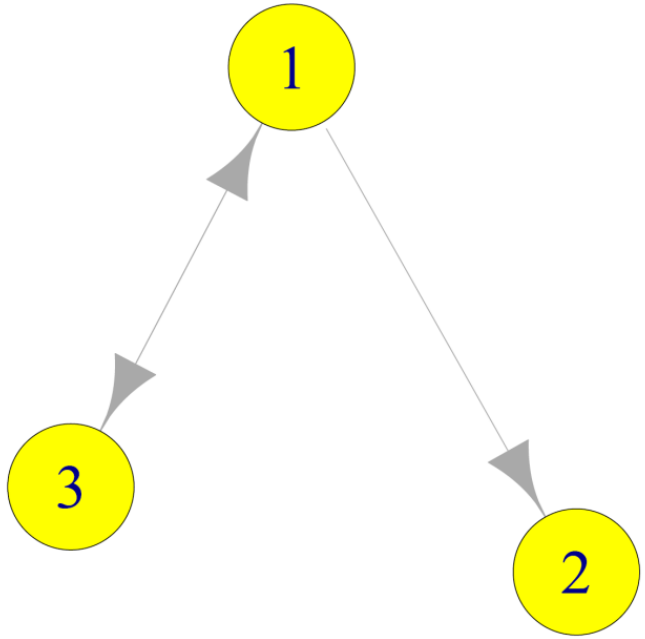
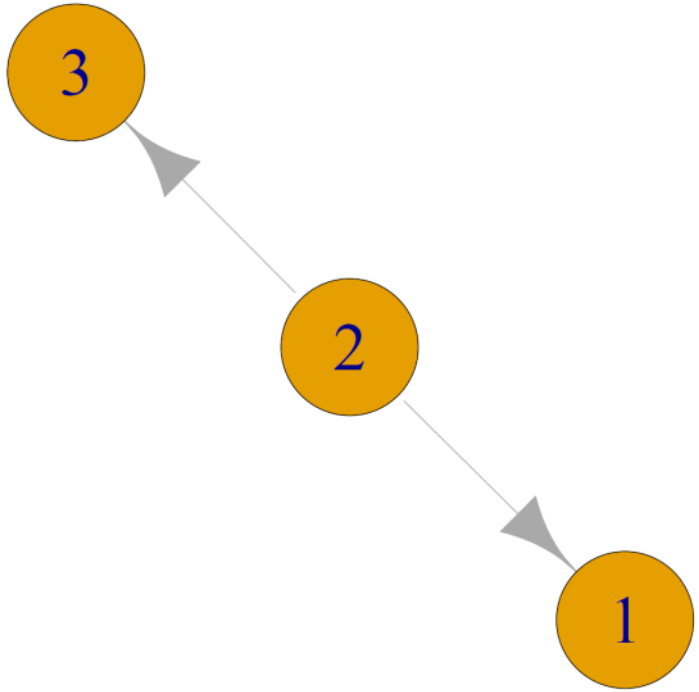


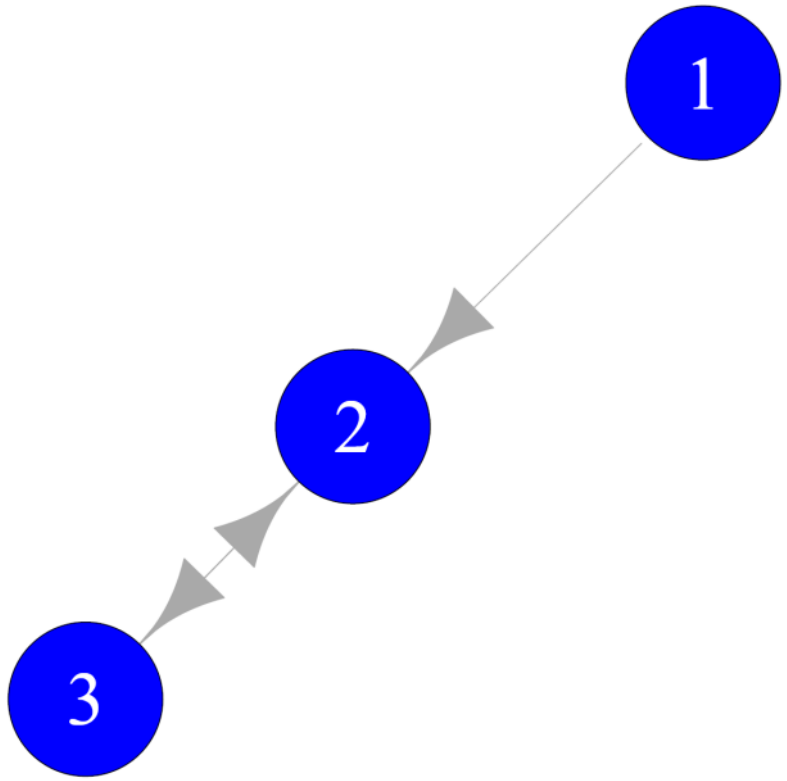
Can you draw what this network would look like?

		To		
		N1	N2	N3
From				
	N1	0	0	0
	N2	1	0	1
	N3	0	0	0



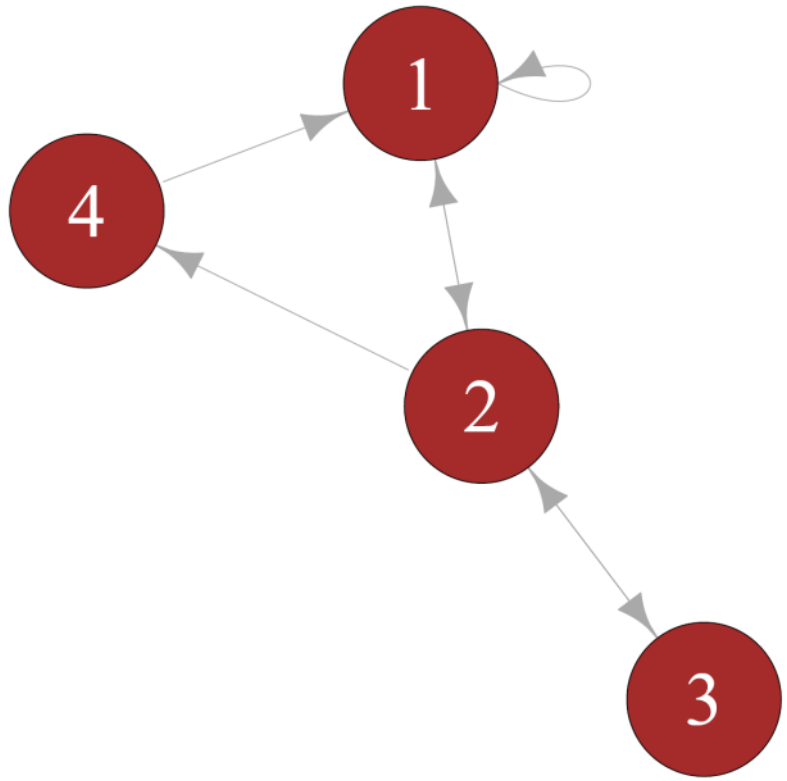
How about this adjacency matrix?

From \ To	N1	N2	N3
N1	0	1	0
N2	0	0	1
N3	0	1	0



Network example 3

From \ To	N1	N2	N3	N4
N1	1	1	0	0
N2	1	0	1	1
N3	0	1	0	0
N4	1	0	0	0



Directed or undirected network?

From \ To	N1	N2	N3
N1	0	1	0
N2	0	0	1
N3	0	1	0

From \ To	N1	N2	N3
N1	0	1	0
N2	1	0	1
N3	0	1	0

Symmetric!

Examples of general questions to ask with networks

- What nodes and links have particularly important roles in the network?
- Are there clusters of nodes?
- How “complex” is the network?
- What would strengthen or weaken the network?

Today we will do most of our work in the igraph package in R

- igraph reference manual
  - http://igraph.org/c/doc/igraph-introduction.html
  - Definitely a reference – more detail than you might want to read through for a first try
- Katya Ognyanova has prepared some user friendly introductions
  - Network visualization: http://kateto.net/network-visualization
  - igraph in R: http://kateto.net/networks-r-igraph

Let’s move to the markdown!

kelseyandersen.github.io/NetworksPlantPathology/