**Midterm Review**

* Path: a sequence of nodes that each consecutive pair is connected by an edge.
* Component: set of nodes that can be traversed through a path are part of the same component.

Note: a single node by itself IS a component.

* Gatekeeper: a node that if it is removed, the graph is broken into two or more components.
* Bridge: an edge that if it is removed, the graph is broken into two or more components.
* Local Bridge: an edge that if it is removed, there would still exist an alternative path between the two nodes that were connected through that edge. For example if edge AB is a local bridge, then if edge AB is removed, there would still exist another path between AB with the length of more than two, that connects A to B.
* Triadic Closure: A satisfies the triadic closure property if AB and AC are both strong edges and BC is either week or strong.
* Clustering co-efficient of node A : number of the edges that currently exist between node A’s neighbors / total number of the edges that can exist between A’s neighbor.
* Embeddedness of an edge in a network is the number of common neighbors the two endpoints have.

a bridge has embeddedness of zero.

* **Neighborhood overleap of node A and B:  number of shared neighbors between A and B/ total number of the neighbors of both node A and B**
  + **PLEASE PLEASE DO NOT DOBULE COUNT!**

Density of a component: number of the present edges in the component / number of all possible edges.

* Number of all possible edges in a graph with n nodes is (n \* (n-1))/2
* Test for homophile: if the proportion of cross edges to total number of present edges in the graph is significantly less than 2pq then there is evidence for homophile.
  + example:]coloring a graph with two colors then p and q for the colors.
  + p: probability of being a male
  + q: probability of being a female
  + qp + pq = probability of edge connecting a male to a female
  + p: 1/3 q:2/3 the 2pq = 4/9
  + then we check the graph to see how many cross edges out of total present edges exist. Then we compare that with the 2pq value. If that value was smaller than 2pq then there exist a homophile in the graph.
* pivot is a node that lies on every shortest path between two nodes.
* local gatekeeper is a node that is connected two other nodes that there exists no direct edge between those two nodes. A is connected to B, A is connected to C but C is not connected to B. Therefore A is a local gatekeeper.
* Balanced triangle: A triangle that has either 1 or 3 positive edges.