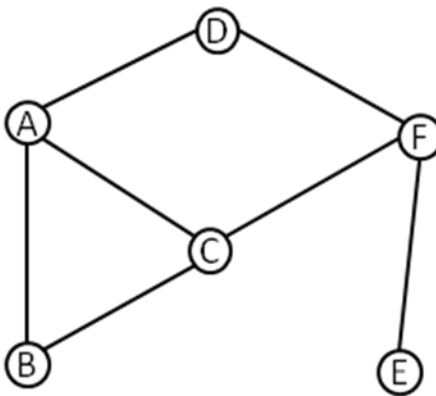
	Course: Communications & Networks (BCM-0506)	
	Professor: Carlos Alberto Kamienski	Data: 18/07/2016
	Student:	RA:

## Exam #1 – 2016.2 – Group B

1) Consider the following graph



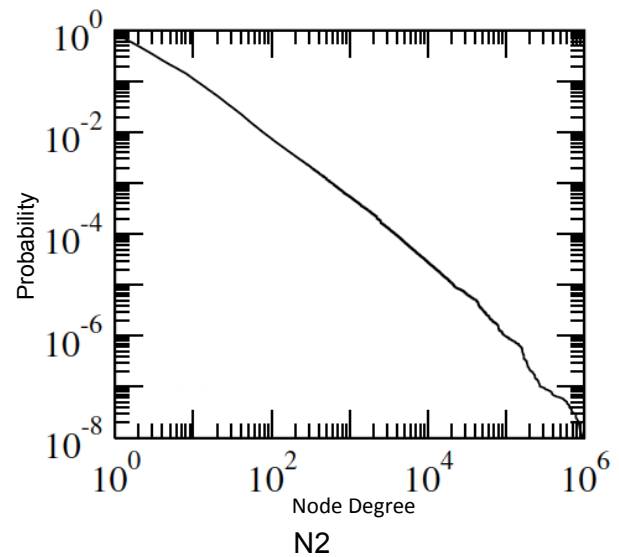
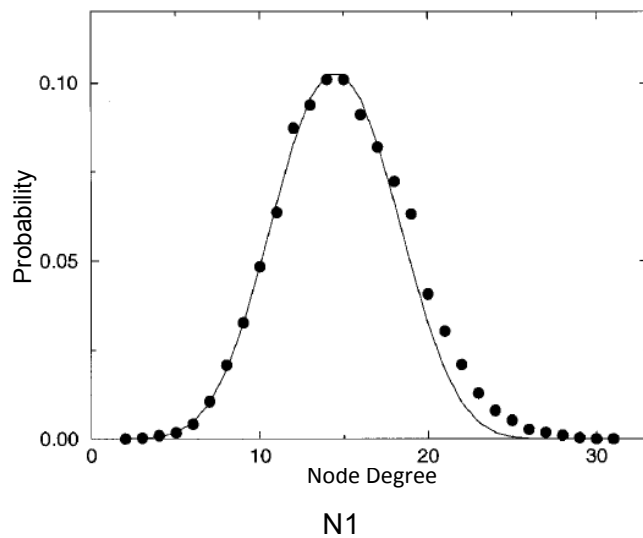
- Build the adjacency matrix for this graph
- Compute the diameter of this graph
- Compute the path from A to E using the Depth-First Search (DFS) algorithm

2) Consider a network represented by the following adjacency matrix:

$$A = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 1 & 0 & 1 & 0 \\ 1 & 1 & 0 & 1 \\ 0 & 0 & 1 & 0 \end{bmatrix}$$

- Compute the clustering coefficient of this network
- What does this clustering coefficient mean? In your answer consider a situation where you only have access to this clustering coefficient and cannot see the network. What could you say about that network by only analyzing its clustering coefficient?

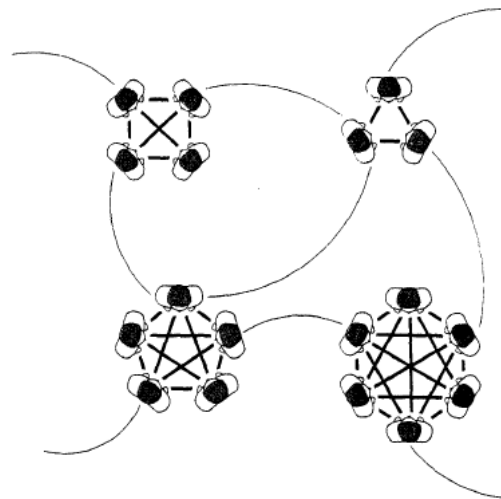
- 3) Charts below depict node degree distributions for two networks N1 and N2 (degree distributions on X axis and probability of occurrence on Y axis)



For both networks, analyze their susceptibility to different types of failures (i.e. whether they are robust or fragile to a given type of failure)

- Are N1 and N2 susceptible to accidental failures? Why?
- Are N1 and N2 susceptible to failures of specific nodes (i.e. attacks)? Why?

- 4) Nodes of a social networks are organized according to graph below



- Is the clustering coefficient of this network higher or lower than a typical random network? Why?
- Is the diameter this network higher or lower than a typical random network? Why?