AMRITA VISHWA VIDYAPEETHAM
DEEMED TO BE UNIVERSITY

19CSE337 Social Networking Security

Lecture 7

Topics to Discuss

- Network Centrality
- Degree Centrality

Introduction

- What is social network analysis?
  - Social network analysis is a way to understand how networks behave and uncover the most important nodes within them.

Network Centrality

- Network centrality is the measure of importance of a node in a network.
- Centrality measure is a vital tool for understanding networks.
- This essentially helps us to identify :
  - Influential nodes in a Social Network.
  - Nodes that disseminate information to many nodes
  - Hubs in a transportation network
  - Important pages in the Web
  - Nodes that prevent the Network from breaking up

Centrality Measures

- Important measures:
  - Degree Centrality
  - Betweenness Centrality
  - Closeness Centrality
  - Eigen Vector Centrality

Degree Centrality

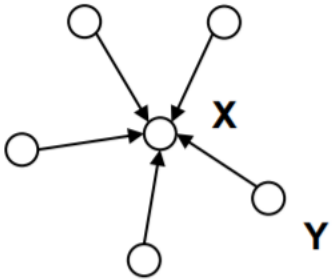
- Degree centrality is the simplest measure of node connectivity.
- It finds nodes with the highest number of links to other nodes in the network.
- ie; How many direct, ‘one hop’ connections each node has to other nodes in the network.
- Measures the number of direct ties to a node.

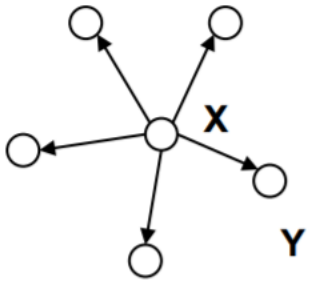
Degree Centrality

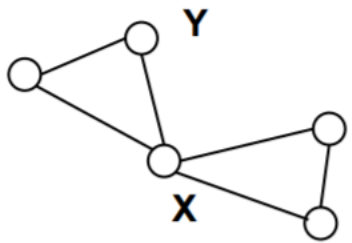
- Nodes with a high degree centrality have the best connections to those around them. So that
  - they might be influential, useful in finding very connected individuals, popular individuals, individuals who are likely to hold most information or individuals who can quickly connect with the wider network.

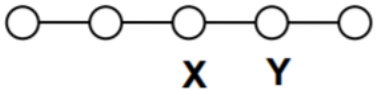
Degree Centrality

- In each of the following networks, X has higher centrality than Y.



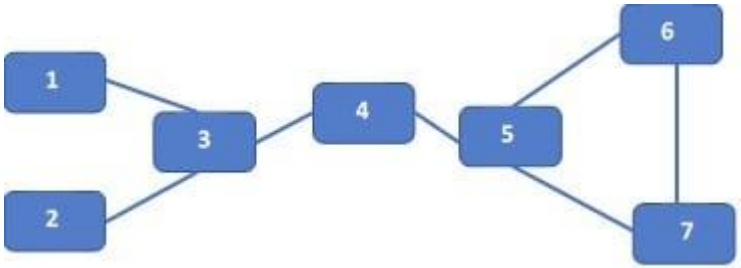






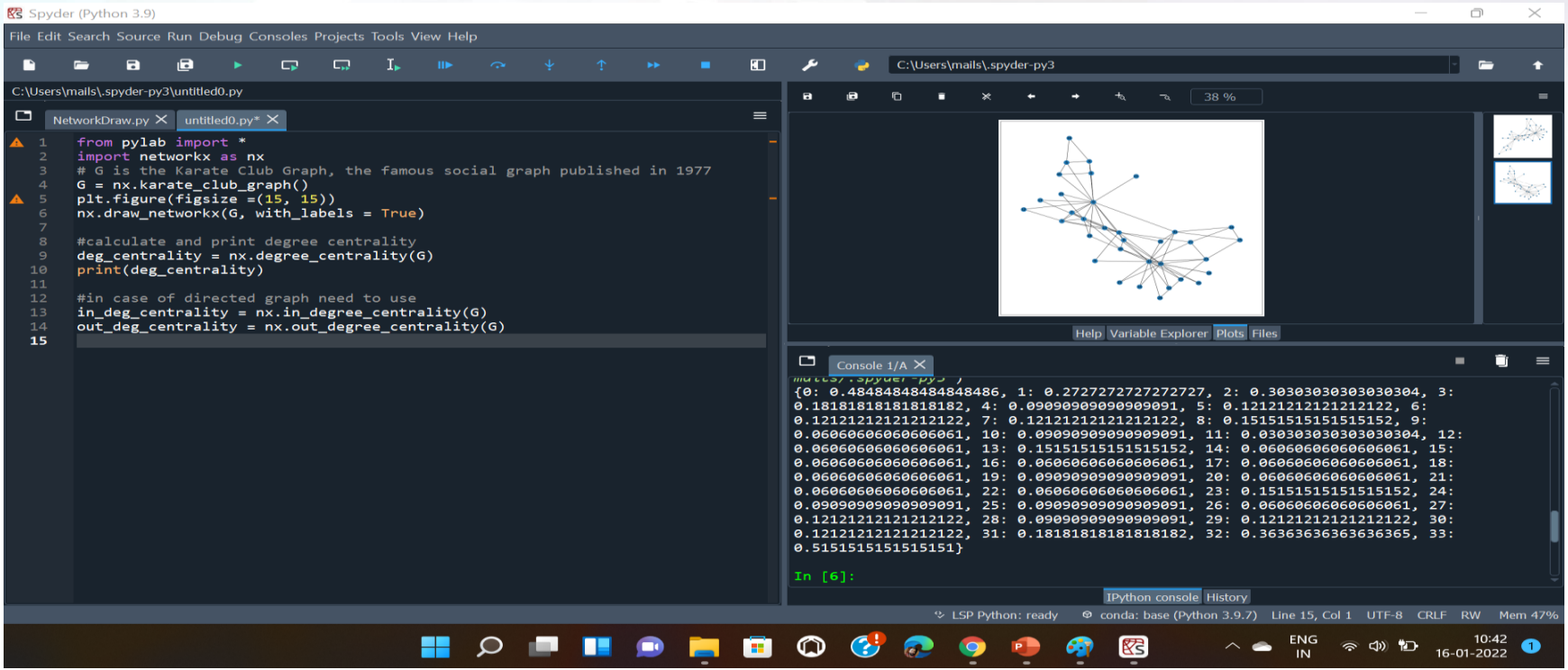
Degree Centrality Calculation

- Degree centrality of a node v is calculated as Degree_Centrality(v)=(d_v / (n-1)), where d_v the degree of vertex and n is total number of nodes in the graph (Max.possible).



Node	Score	Standardized Score
1	1	1/6
2	1	1/6
3	3	3/6 = ½
4	2	2/6 = 1/3
5	3	3/6 = ½
6	2	2/6 = 1/3
7	2	2/6 = 1/3

Degree Centrality using NetworkX



Thanks……