

Week 2 Assignment

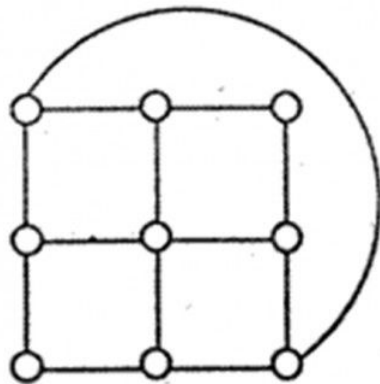
Social Networks

1. In the synonymy network of English language, we can traverse from the word 'LOVE' to 'HATE'. What can we say regarding the *relation* of synonymy over English words?
 - a. It is Reflexive only.
 - b. It is equivalence
 - c. It is symmetric as well as reflexive.**
 - d. It is POSET.

Explanation: It is not transitive , because of slight degradation from "a" to "b" and then "b" to "c" , therefore "a" is not 100% synonym to the "c".

2. Which of the following is the most correct with respect to a social network graph?
(Choose the best one):
 - a. It is always a complete graph
 - b. It is always a connected graph
 - c. It is most probably a connected graph**
 - d. It is most probably a disconnected graph

3. What is the density of the given graph?



- a. 13/36**
- b. 13/45
- c. 36/13
- d. 45/13

Explanation: By the definition of density of the graph, it is the ratio of number of edges to the total possible edges.

4. Choose the one that is **False** out of the following:
 - a. GML stands for Graph Modeling Language.

b. GML stores the data in the form of tags just like XML.

- c. GML and GraphML are different formats.
- d. Both GML and GraphML can store details of attributes of nodes and edges.

Explanation:

GML stands for Graph Modeling Language and it is different from a GraphML format. Also, it is possible to store the attributes of nodes and edges in both the formats. Therefore, the options a, c and d are True and hence not the correct answers.

However, GML does not store the data in the form of tags like XML unlike GraphML, hence the option b is false and hence the correct answer.

5. Which of the following formats was created as a part of Gephi project?

- a. GML
- b. GEXF**
- c. GraphML
- d. Pajek

Explanation:

GEXF format was created in 2007 by the people working for the Gephi project. This new format was created to avoid the exchange issues associated with the existing formats and to provide better extensibility and ease of storing various details regarding the networks.

6. Gephi is used for? (Choose the best option):

- a. The analysis of networks
- b. The visualization of networks
- c. The analysis as well as visualization of networks**
- d. For merging of network data sets.

Explanation:

Gephi provides features for the analysis as well as the visualization of networks.

7. Which of the following is not used as an extension for a network data set?

- a. .net
- b. .txt
- c. .nif**
- d. .gdf

Explanation:

.NET extension is used for graphs in Pajek format; .txt is used for edgelist or adjlist formats; .GDF is a format for graphs which is similar to CSV format. However, .NIF is a format for images, and not for network

8. Which of the following network formats is the most unsuitable for adding attributes for edges?
- a. GEXF format
 - b. GML format
 - c. Pajek Format
 - d. Adjlist format**

Explanation:

Adjlist format carries limited details about a network and is relatively less flexible when it comes to assigning attributes to graph, nodes and edges.

9. The average clustering coefficient of a complete graph with 100 nodes will be?
- a. 0
 - b. 1**
 - c. 100
 - d. 0.01

Explanation:

In a complete network, all the neighbors of any given node are friends to each other, hence, the clustering coefficient of every node will be 1. Therefore, the average clustering coefficient will also be 1

10. The degree distribution of most real-world networks follows which law?
- a. Zipf's Law
 - b. Benford's Law
 - c. Power Law**
 - d. Difficult to say; can follow any distribution

Explanation: Degree distribution of most real-world networks follows power law, which means there are very few nodes with very high degrees and there are a lot of nodes with very less degrees.