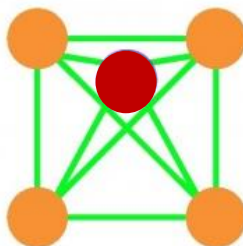
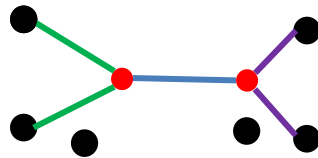


Mark T or F for each true or false sentence, respectively.

- 1- The graph data structure can be used to solve complex **problems**.
- 2- Behind each complex system there is a network, that defines the interactions between the **component**.
- 3- Assume that, the matrix E represents the adjacency matrix for a graph, the matrix $E \times E$ has no **information**.
- 4- The bipartite graph can be represented as the complete **network**.
- 5- The social network is a graph data structure, where the node represents person and the edge represents **link**.
- 6- The facebook's graph of people proves that the six-degree separation theory is **wrong**.
- 7- To proof the six-degree separation theory, we must estimate the shortest path between each two **nodes**.
- 8- The oldest network is the metabolic **network**.
- 9- The largest network containing nodes is the social network **sites**.
- 10- In social networks, we can predict the link between the **people**.
- 11- If you want to understand the spread of diseases, you need to figure out who will be in contact with **whom**.
- 12- If you want to understand the structure of the Web, you have to analyze the '**links**'.
- 13- The random graph generator can represent the real-world **networks**.
- 14- Assume that we have next graph, the cluster coefficient for red **node is 0.9**.

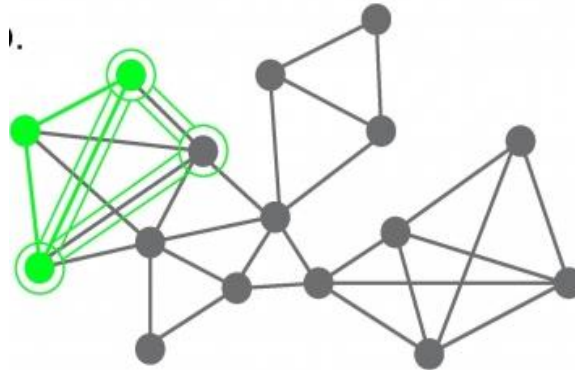


- 15- The concept of comes from the analysis social **networks**.
- 16- Preferential Attachment model can represent the real **network**.
- 17- A node with high value of cluster coefficient means that the neighbors of this node have many shared **links**.
- 18- We can see the concept of homophily in **birds**.
- 19- The Granovetter's concept says that the people knows about the jobs from their close **friends**.
- 20- Onnela's experiment proofed the Granovetter's concept in real-world **network**.
- 21- If two nodes have small value for the overlap coefficient, this that the link between these nodes is weak **tie**.
- 22- Assume, we have the next graph, the overlap coefficient for red nodes **is 1**.



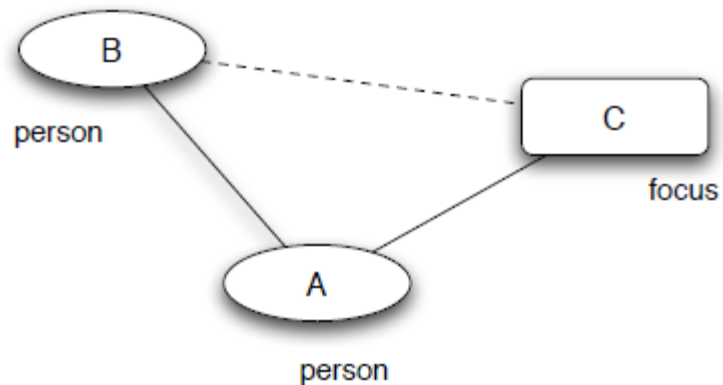
- 23- If someone becomes obese, then his/her friend can be **obese**.
- 24- The enemy of my enemy is my friend, this is a balance **network**.
- 25- The enemy of my enemy is my enemy, this is a balance **network**.
- 26- This balance networks are changed a lot with **time**.
- 27- the Barabási-Albert model is a model that can generate random **graphs**.
- 28- The richer becomes richer is the idea of the Barabási-Albert **model**.
- 29- Barabási-Albert model, we the node is selected randomly, this means that all nodes have the same **probability**.
- 30- Zachary's Karate Club dataset used in community detection algorithms, because this dataset contains small number of **nodes**.

- 31- Clique Finder is one the best methods to find community in social networks.
- 32- Two k -cliques are considered adjacent if they share k nodes
- 33- Assume we have next graph. The green nodes represent the complete clique.

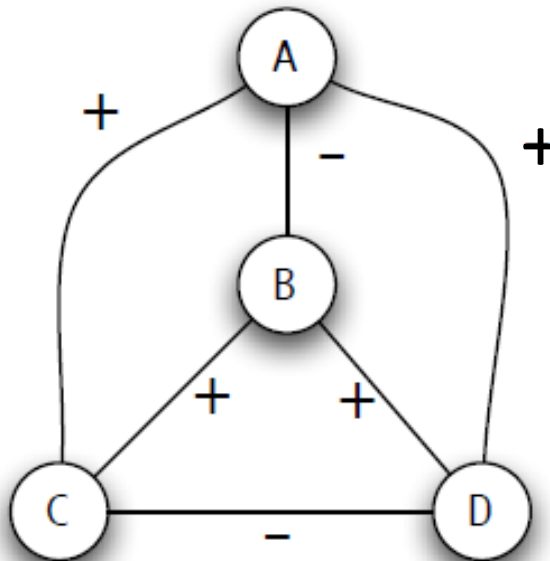


- 34- The maximum modularity hypothesis can measure the quality of community detection methods.
- 35- The agglomerative hierarchical clustering is one of easiest method to find community in social network graph.
- 36- The Ravasz Algorithm uses link betweenness measurement to find community detections.
- 37- Affiliation Networks contains two types of nodes: person and Focal points of social interaction.
- 38- We can use Affiliation networks in analyzing the spread of coronavirus.
- 39- We cannot predict how the social network is formulated during large number of years.
- 40- Ego network contains the persons and their behaviors.
- 41- The fake news can be diffused into the social network.
- 42- We can know the importance of the graph node from its degree.

43- The next graph is called membership **closure**.



44- The next network is a balanced **network**.



45- The student friendship in the first year in the university is a random **network**.

46- For Erdős-Rényi network, the node degree distribution is only Poisson **distribution**. **F**

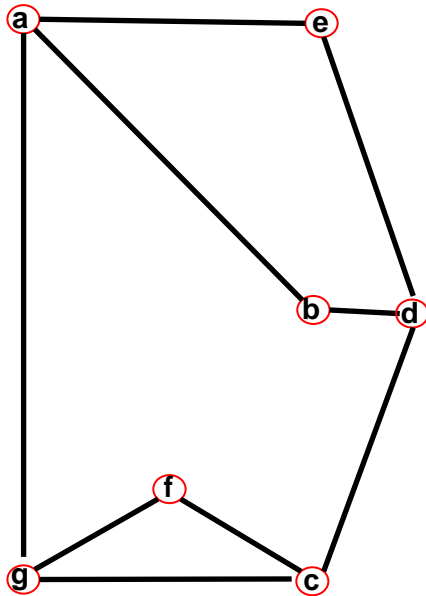
47- Social network can be used to predict the **criminals**.

48- Network science is can be used in **biology**.

49- Real Networks are **supercritical**.

50- The critical point separates the regime where there is not yet a giant component ($\langle k \rangle > 1$).

Assume we have the next graph and the **adjacency matrix**.



	a	b	c	d	e	f	g
a	I				II		
b							
c		III					IV
d							
e				V			
f							
g							
h							

51- What is the value of I
a) 0 b) 1 c) 2

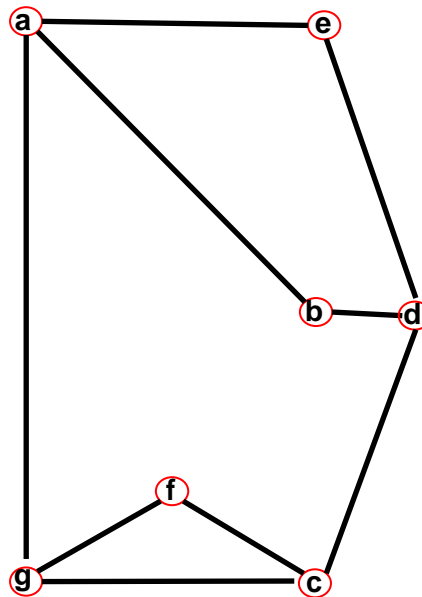
52- What is the value of I
a) 0 b) 1 c) 2

53- What is the value of I
a) 0 b) 1 c) 2

54- What is the value of I
a) 0 b) 1 c) 2

55- What is the value of I
a) 0 b) 1 c) 2

Assume we have the next graph and the adjacency matrix.



56- What is the degree of the node e

- a) 2 b) 3 c) 4

57- What is the degree of the node b

- a) 2 b) 3 c) 4

58- What is the degree of the node c

- a) 2 b) 3 c) 4

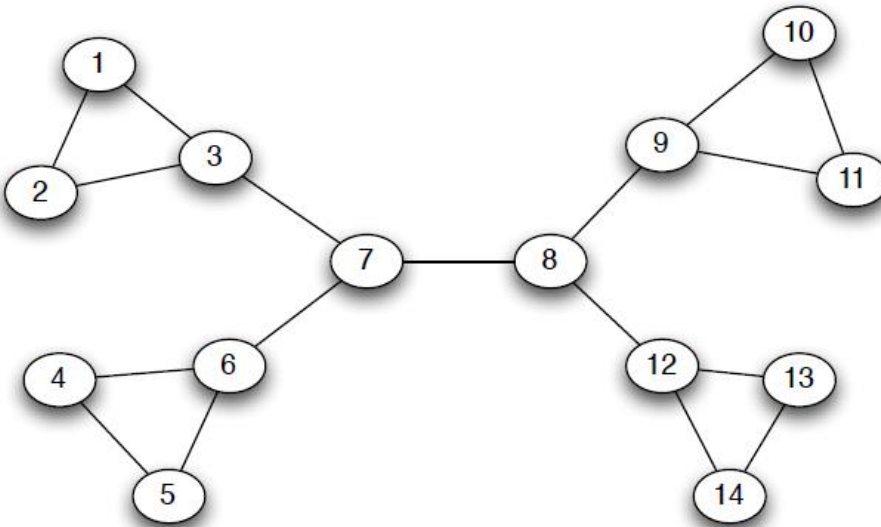
59- What is the degree of the node f

- a) 2 b) 3 c) 4

60- What is the degree of the node g

- a) 2 b) 3 c) 4

Assume we have the next graph:



61- What is the value of link betweenness for the node 5 and 7?

- a) 49 b) 33 c) 12

62- What is the value of link betweenness for the node 6 and 7?

- a) 49 b) 33 c) 12

63- What is the value of link betweenness for the node 4 and 6?

- a) 49 b) 33 c) 12

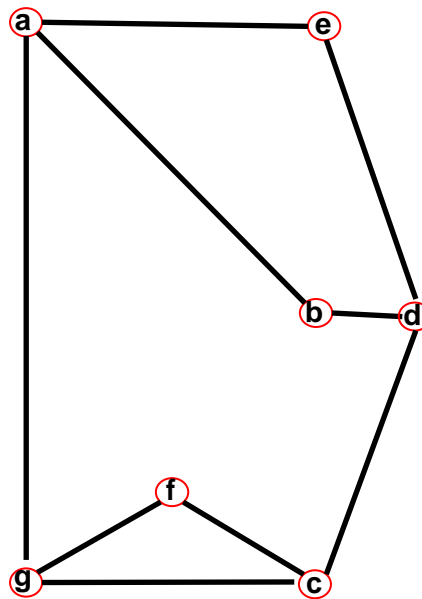
64- Which algorithm uses the link?

- a) Girvan-Newman Algorithm
b) hierarchical clustering
c) Clique finder

65- In graph partitioning method, the first removed link is

- a) 7-8 b) 6-7 c) 1-2

Assume we have the next graph:



66- The edge between c and d is called

- b) link **b) bridge** c) tie

67- The edge between a and g is called

- a) link **b) bridge** c) tie

68- How many are community in this graph?

- b) **2** b) 3 c) 4

69- The relation between c and d is

- b) normal b) strong **c) weak**

70- If d has strong relation with e and b, then e and b can has

- b) a strong relation. b) a weak relation. **c) a strong or weak relation.**