Week 10 Quiz [Fall 2019]

Due Nov 1 at 11:59pm **Points** 16 **Questions** 16
Available Oct 26 at 12am - Nov 1 at 11:59pm 7 days **Time Limit** None

Instructions

Submission Guidelines

This assignment has multiple-choice and numeric response questions. Only one submission is allowed, however as long as the quiz is not submitted, it is automatically saved and can be resumed.

Upon submission, make sure you have a record of the submission (with timestamp) on the assignment/quiz page on Canvas. If we do not have your submission in Canvas, you will **not** receive credit.

It is essential to follow these instructions to provide answers for this assignment. **Students who do not follow these guidelines will lose points.**

Attempt History

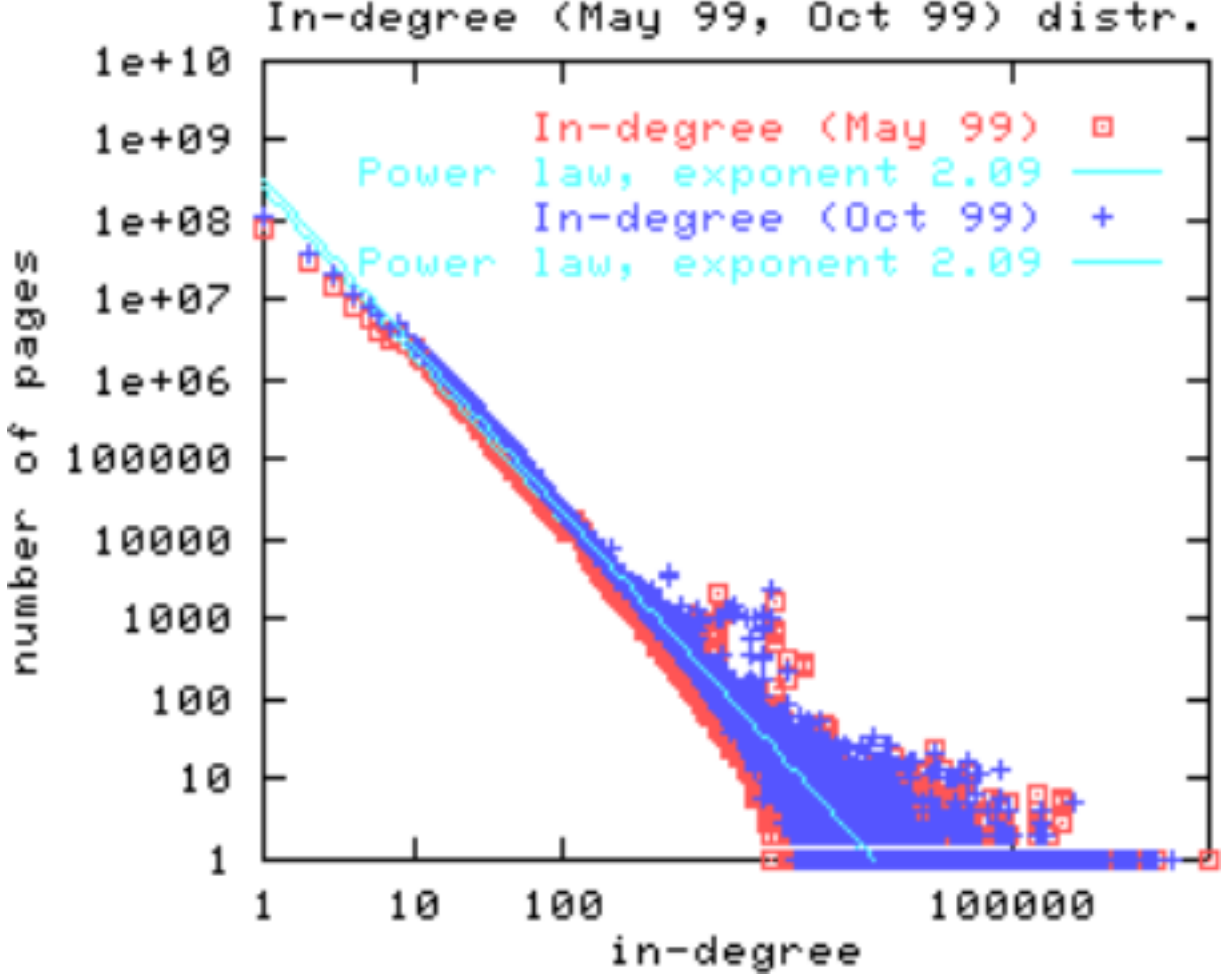
	Attempt	Time	Score
LATEST	Attempt 1	122 minutes	13 out of 16

Score for this quiz: **13** out of 16
Submitted Oct 31 at 2:37am
This attempt took 122 minutes.

Question 1

0 / 1 pts

The following plot comes from **a study (http://www.immorlica.com/socNet/broder.pdf)** of 200 million (2 x 10^8) web pages and the links between them. It is a log-log plot of the number of pages (y-axis) with a given number of in-links (x-axis):



Approximately how many pages have only one other page linking to it?

orrect Answer

- 10^8
- 1
- 10^2
- 10^4

ou Answered

- 10^6

Question 2

0 / 1 pts

Consider again the plot in the previous question

Approximately how many pages have 10 other pages linking to it?

orrect Answer

- 10^6
- 1

10^2

You Answered

10^4

10^8

Question 3

1 / 1 pts

What is the central idea behind the notion of “six degrees of separation”?

Correct!

Social networks have small average path length

Social networks have high clustering coefficients

Social networks have many high-degree nodes

Social networks are sparse

Question 4

0 / 1 pts

In class and in the readings we've discussed the difference between fat-, wide-, or heavy-tailed distributions, e.g. power-law, as compared to skinny- or exponential-tailed distributions such as the Gaussian/Normal and binomial.

True or False: The distribution of US adults' shoe sizes exhibits a heavy-tailed distribution.

You Answered

True

Correct Answer

False

Question 5

1 / 1 pts

If peoples' heights were distributed according to a heavy-tailed distribution, would it be unrealistic to see a 30-foot tall person in a crowd?

Correct!

- (•) No
- ( ) Yes

Question 6

1 / 1 pts

True or False: The distribution of node degrees in a random network exhibits a heavy-tailed distribution.

- ( ) True

Correct!

- (•) False

Question 7

1 / 1 pts

True or False: The distribution of US household income exhibits a heavy-tailed distribution.

Correct!

- (•) True
- ( ) False

Question 8

1 / 1 pts

True or False: The distribution of node degrees in the Twitter follower network exhibits a heavy-tailed distribution.

Correct!

- (•) True
- ( ) False

Question 9

1 / 1 pts

Which of the following features would you expect to find in a network with a heavy-tailed degree distribution but ***not*** in a random network with the same number of nodes and edges?

Correct!

- (•) Hub nodes with degree many times larger than that of a typical node
- ( ) Nodes with degree greater than one
- ( ) Short average path lengths
- ( ) Long average path lengths

Question 10

1 / 1 pts

Which parameter gives the broadness of the *degree distribution*?

Correct!

- (•) Heterogeneity
- ( ) Betweeness
- ( ) Degree
- ( ) Diameter

Centrality

Question 11

1 / 1 pts

True or false: When you want to plot a distribution which contains a large range of values, from very small to very large, it is best to use a linear scale.

True

Correct!

False

You would almost always want to use a logarithmic scale

Question 12

1 / 1 pts

Suppose we have a social network with N nodes and average node degree <k>. Let's call it G1. Now consider a second network with 2N nodes but the same average node degree <k>. Call this one G2. How does the APL compare between G1 and G2?

Correct!

The APL of G2 is slightly higher than that of G1

The APL of G2 is lower than that of G1

The APL of G2 is the same as that of G1

The APL of G2 is double that of G1

Question 13

1 / 1 pts

Are there networks such that the average number of neighbors of a node's neighbors match the average degree?

If there are, what property must they have?

Correct!

- (•) All nodes have the same degree
- ( ) Such a network is not possible
- ( ) Degree distribution must be heavy-tailed
- ( ) The number of hubs in the network must be exactly n(n-1)/2

Question 14

1 / 1 pts

What best describes the vulnerability of networks with heavy-tailed degree distributions to random
or targeted attacks?

- ( ) They are equally vulnerable to both types of attacks
- ( ) They are equally resilient to both types of attacks
- ( ) Their vulnerability to both is average
- ( ) They would be more vulnerable to random, as opposed to targeted, attacks

Correct!

- (•) They would be more vulnerable to targeted, as opposed to random, attacks

Question 15

1 / 1 pts

Consider two nodes of equal degree on some network: one with high

clustering
coefficient and one with low clustering coefficient. All else being equal, which of the two would you intuit to be a better target if you were seeking to disrupt the network?

Correct!

- (•) The node with lower clustering coefficient
- ( ) The node with higher clustering coefficient

Question 16

1 / 1 pts

The friendship paradox states that "Our friends have more friends that we do, on average"

Pick the type of network in which this is most likely to occur

Correct!

- (•) Scale free
- ( ) Regular (All nodes have same degree)
- ( ) Random
- ( ) Tree

Quiz Score: **13** out of 16