STAT 332: Network Analytics Homework 1
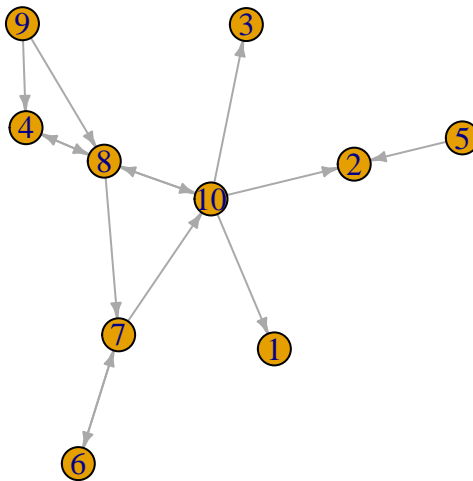
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Instructions:

Please complete this homework assignment by the due data posted on canvas. Please submit your work in a pdf file with solutions and code presented completely.

Homework 1: Network Basics

Question 1:

For question 1, please use the following graph:

STAT 407 – Homework 1: Graph for Question 2

1.a) Create and report the adjacency matrix associated with this graph.

1.b) Create and report the edgelist associated with this graph.

1.c) Report a solution to each of the following

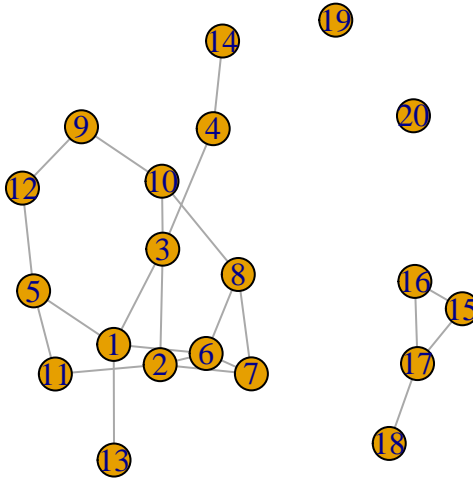**a.) Find a walk that is <u>not a path</u> from 5 to 1**

b.) Find a path from 9 to 6

c.) Report the size of this graph

d.) Report the density of this directed graph

Question 2:

For question 2, please refer to the following graph:

STAT 407 – Homework 1: Graph for Question 2

2.a) Identify the neighborhood of vertex 3.

2.b) Identify any vertices that are isolates.

2.c) Calculate the density of this unidrected graph.

2.d) How many components does this graph have?

2.e) Find the diameter of the largest component of this network.

Question 3:

Describe, in words and with real world examples, the three different levels of analysis that we are interested in for network analysis.

Question 4:

From the file "Question4Edgelist.csv" please load in the network. This is an undirected graph.

For this question, please report the size, density, and number of components for this graph.