# Midterm Exam I Topics

## Use Bloom’s Taxonomy verbs to create an exam-like question per topic. Each question is worth 2 points, which will be counted towards your Quiz grade.

1. Complex systems

Illustrate an example of a complex system.

1. What is a network

Identify the characteristics of a network.

1. Representing networks
   1. Adjacency matrix

Define an adjacency matrix for graph A. \*graph A would be on the bottom of the page\*

* 1. Bipartite networks

Explain the concept of a bipartite network.

* 1. Directed vs Undirected networks

Develop a small example of a directed network, and describe the difference between that and an undirected network.

* 1. Weighted vs Unweighted networks

Develop a small example of a weighted network, and describe the difference between that and an unweighted network.

1. Network degree

Extract the degree of network A. \*network A would be on the bottom of the page\*

1. Pathology
   1. Distances

In graph A, what is the distance between node 0 and node 12? \*graph A would be on the bottom of the page\*

* 1. Routes

Define what a route is, pertaining to a weighted, digraph.

* 1. Dijkstra’s shortest path algorithm

Complete dijkstra’s shortest path algorithm to on graph A, with source node 0, and destination node 8. \*graph A would be on the bottom of the page\*

* 1. Cycles

Contrast the two main types of cycles that come out of graph theory.

1. Connectedness

Conclude the connectedness of graph A. \*graph A would be on the bottom of the page\*

1. Clustering Coefficients

Explain what clustering coefficients are, and identify it on graph A. \*graph A would be on the bottom of the page\*

## Vocabulary (in no particular order)

network

link

node

degree

adjacency matrix

bipartite

directed

undirected

cycle

path

Hamiltonian path

Eulerian path

diameter

average path length

average degree

degree distribution

shortest path

Dijkstra’s SPA

geodesic distance

complex system