

Homework 10

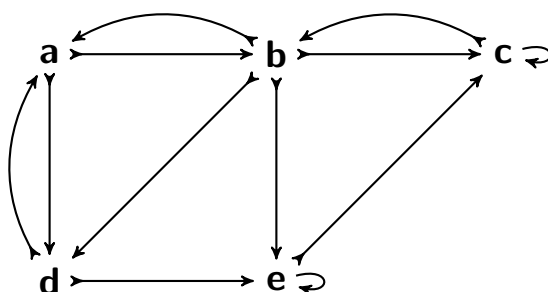
Due December 10, 2013

CMSC 203

1. Section 10.1, Exercise 28

Describe a graph model that represents a subway system in a large city. Should edges be directed or undirected? Should multiple edges be allowed? Should loops be allowed?

2. Section 10.3, Exercise 4



Use an adjacency list to represent the graph above.

3. Section 10.3, Exercise 8

Represent the graph above with an adjacency matrix.

4. Section 10.3, Exercise 12

Draw a graph with the given adjacency matrix.

$$\begin{bmatrix} 1 & 1 & 1 & 0 \\ 0 & 0 & 1 & 0 \\ 1 & 0 & 1 & 0 \\ 1 & 1 & 1 & 0 \end{bmatrix}$$

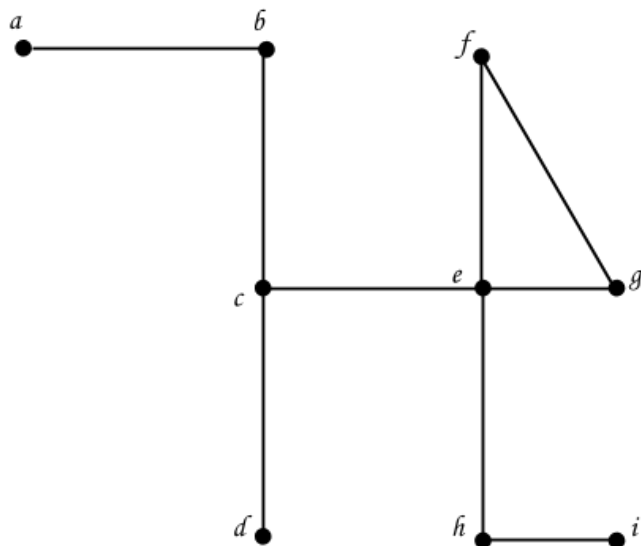
5. Section 10.3, Exercise 36 *modified*

Determine whether the given pair of graphs represented as adjacency matrices are isomorphic.

$$\begin{bmatrix} 0 & 1 & 0 & 1 & 1 \\ 1 & 0 & 1 & 0 & 0 \\ 0 & 1 & 0 & 1 & 1 \\ 1 & 0 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 & 0 \end{bmatrix}, \begin{bmatrix} 0 & 1 & 0 & 0 & 1 \\ 1 & 0 & 1 & 1 & 1 \\ 0 & 1 & 0 & 1 & 0 \\ 0 & 1 & 1 & 0 & 1 \\ 1 & 1 & 0 & 1 & 0 \end{bmatrix}$$

6. Section 10.5, Exercise 34b

Find all the cut edges in the following graph:



7. Section 10.6, Exercise 5b *modified*

Find the shortest path between a and z in the weighted graph below using Dijkstra's Algorithm. What is the cost of this path? Show your work.

