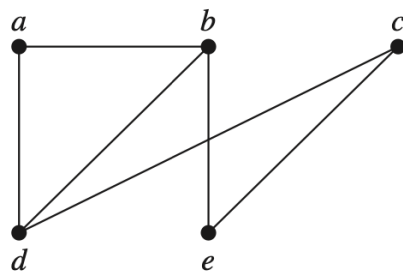


Name: Your name here
Student ID: Your student ID here

CSED261: Discrete Mathematics for Computer Science
Homework 6: Graphs

Question 1. Show that in a simple graph with at least two vertices there must be two vertices that have the same degree.

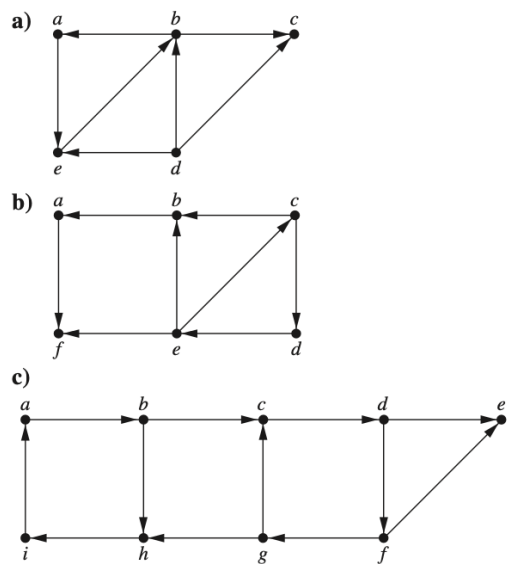
Question 2. Represent the below graph with an adjacency matrix.



Question 3. What is the sum of the entries in a row of the adjacency matrix for an undirected graph? For a directed graph?

Question 4. Suppose that G and H are isomorphic simple graphs. Show that their complementary graphs \overline{G} and \overline{H} are also isomorphic.

Question 5. Find the strongly connected components of each of these graphs.



Question 6. Show that every connected graph with n vertices has at least $n - 1$ edges.

Question 7. Show that a directed multigraph having no isolated vertices has an Euler circuit if and only if the graph is weakly connected and the in-degree and out-degree of each vertex are equal.
