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Individual Assignments #58

Assignment: *Section 9.1: 24a, 28; Section 9.2: 6, 16, 18 (think about Pigeons), 26 a, b, c (think about colorings)*

Q24

a) Email is a communication path from any vertex to any other vertex. Since all vertices are connected the edges are non-directional, any number of edges are allowed, the default being all possible edges. No limits should be placed on communication paths. Loops should be allowed as it is sometimes desirable to send an email to oneself.

Q28

Since the edges are routes they should be directed (shouldn't have two trains going opposite directions on the same track!). Multiples should be allowed but not loops.

Q6

This is a restatement of the handshake principle. It says the twice the edges(handshakes) is equal to the summation over all the people of handshakes. Since the number of people who have shaken hands is twice the number of handshakes (by this principle) then their sum will always be even.

Stated another way:

Assume for sake of contradiction that the sum of the number of people one shakes hands with at a party is odd. (That a graph has an odd# of vertices w/odd degree). If we accept this as true and we sum the odd and even portions of this sum separately, then the odd sum is odd and the even sum is even making the resulting sum odd. Which is against the handshake principle, thus proven to be a contradiction.

Q16

In degree: Represents the influence of other vertices on the vertex in question.

Out degree: Represents the influence the vertex in question has on the other vertices.

Q18

There are two vertices and two possible degrees for these vertices. Zero if they are not connected to each other or one if they are. By the pigeonhole principle there is only the possibility of these vertices having the same degree. Since there are exactly two nodes and they can either be connected only to each other or not.

Q26

a) n=2

b) None

c) None