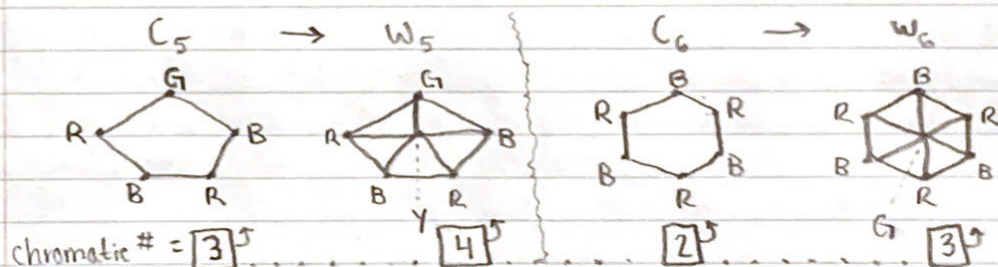


Assignment 12

1. The chromatic number of W_n will always be 3 if n is even, and it will always be 4 if n is odd. A wheel graph is just a cycle graph with an additional vertex in the middle that is connected to every vertex within the cycle. As we know, the chromatic number of a cycle graph C_n will always be 2 if n is even, and it will be 3 if n is odd. The additional vertex in a wheel graph is connected to every vertex within the cycle, so we know that when coloring the wheel graph, a color that does not exist in the cycle must be used. That is, for every corresponding cycle and wheel graph (C_n and W_n) that have the same n vertices within the cycle, the wheel graph will have a chromatic number that is 1 more than that of the cycle graph. Thus, if a cycle graph C_n has a chromatic number that is always 2 if n is even and 3 if n is odd, then the chromatic number of a wheel graph W_n will always be 3 if n is even and 4 if n is odd. This is depicted below for C_5 , W_5 , C_6 , and W_6 . R = red, B = blue, G = green, Y = yellow



2. The minimum number of different meeting times needed so that there are no scheduling conflicts is 5. There are only 5 CS faculty (DeWitt, Joseph, Vernon, Goodman, and Meyer), so 2 committees that each have 3 members cannot meet at the same time (that would result in 6 spots to fill at the same time when there are only 5 faculty). There is only 1 committee that has less than 3 members (Facilities: Goodman, Vernon). As such, the only committee that can be scheduled to meet at the same time is Graduate Admissions, as it consists of the other three faculty (DeWitt, Joseph, Meyer). In terms of a graph where each vertex represents a committee and each edge represents a scheduling conflict, the graph is nearly complete, with the only absent edge being between Facilities and Grad. Admissions. The chromatic number is 5, which is the minimum times needed. This is represented below.

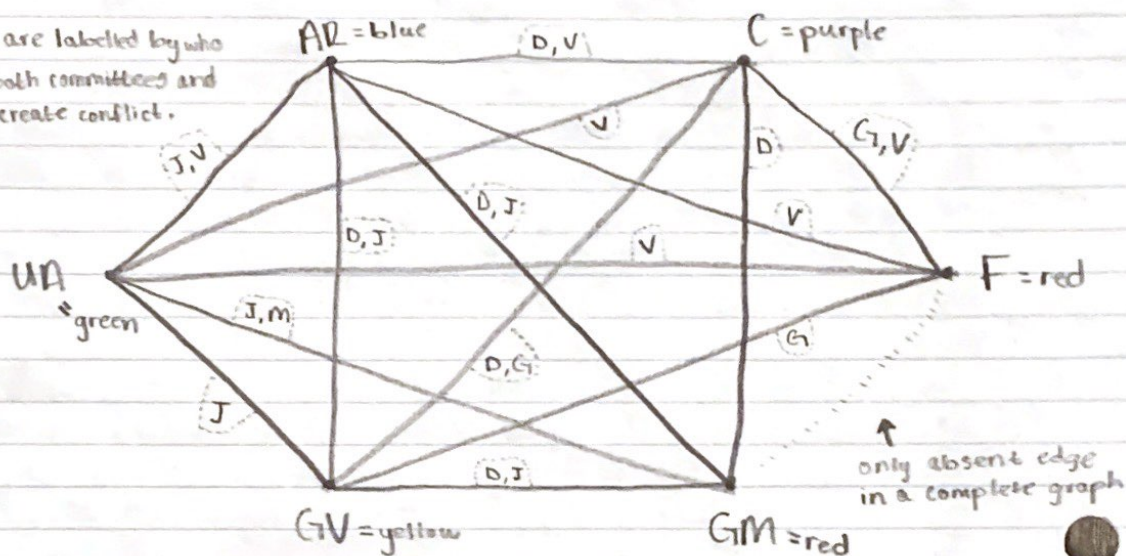
Assignment 12 cont.

2 cont.

AR = Alumni Relations, C = Curriculum, F = Facilities, GM = Grad. Admissions

GV = Grad Advising, UA = Undergrad. Advising D = DeWitt, J = Joseph, V = Vernon, M = Meyer, G = Goodman

Edges are labelled by who is in both committees and would create conflict.



As shown above, the only absent edge is between Facilities and Graduate Admissions, and this represents that there would be no conflict if they were scheduled to meet at the same time. However, all other committees would conflict (as represented by edges) and thus, 5 different meeting times are needed. ■