

Topics... Two Graph Coloring Problems

(Continued from page 7)

because red squares are adjacent only to black squares and conversely. Try drawing a few other bipartite graphs and verifying that their vertices can be colored using two colors.

Your assignment, if you accept it, is to figure out what all of this has to do with the second problem. (And, if the terms are familiar to you, how these problems involve matchings and Hamilton paths.) The solution will appear in the next issue. If you use these problems in class, please write a few paragraphs for the next Newsletter telling us what happened.

Spreading the Word... Introducing Teachers to Discrete Mathematics

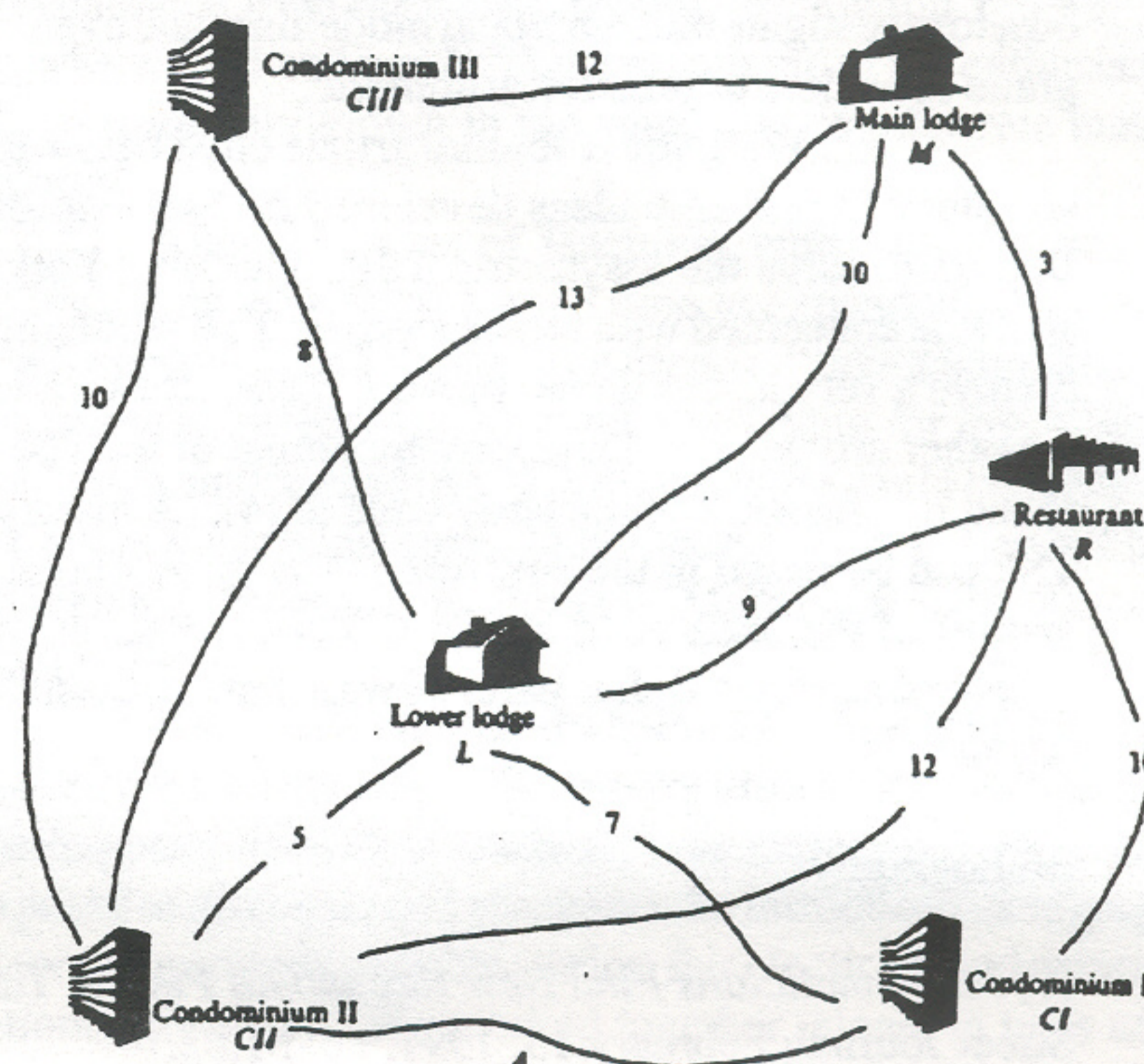
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and I can say with assurance that the enthusiastic response received from teachers in workshops I have conducted has been matched, if not exceeded, by the response of the students in my own classes.

Illustration... Planning Roads

(Continued from article on right of page 8)

Which of the roads in the picture should be built if we want to connect all six locations at the smallest possible cost? (The cost to build each road is given in thousands of dollars.)



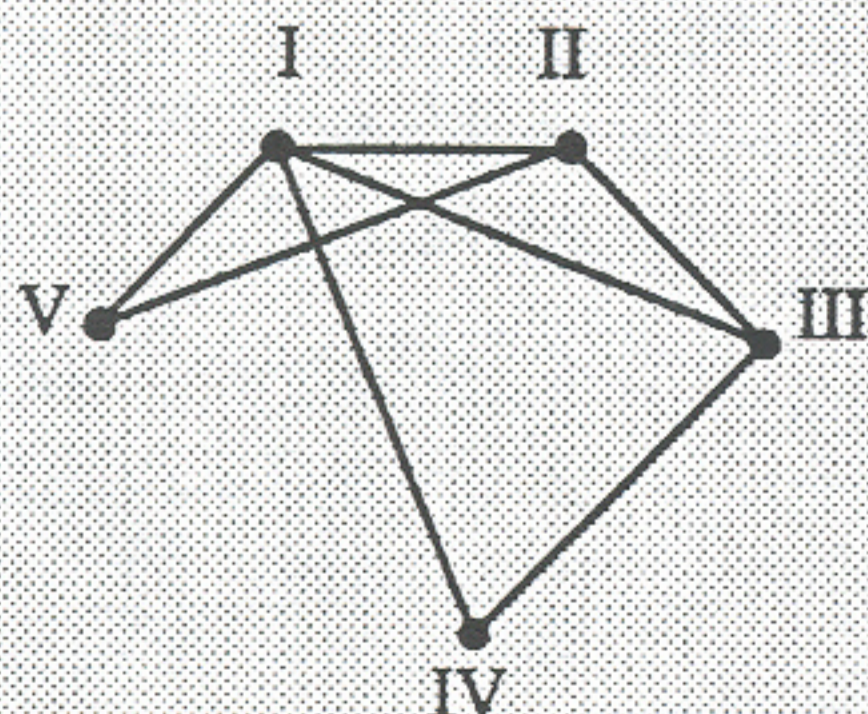
This problem is taken from HiMAP module 6, *Problem Solving Using Graphs*, by Margaret Cozzens and Richard Porter, COMAP, Arlington, MA (1987).

Illustrations... Scheduling Meetings

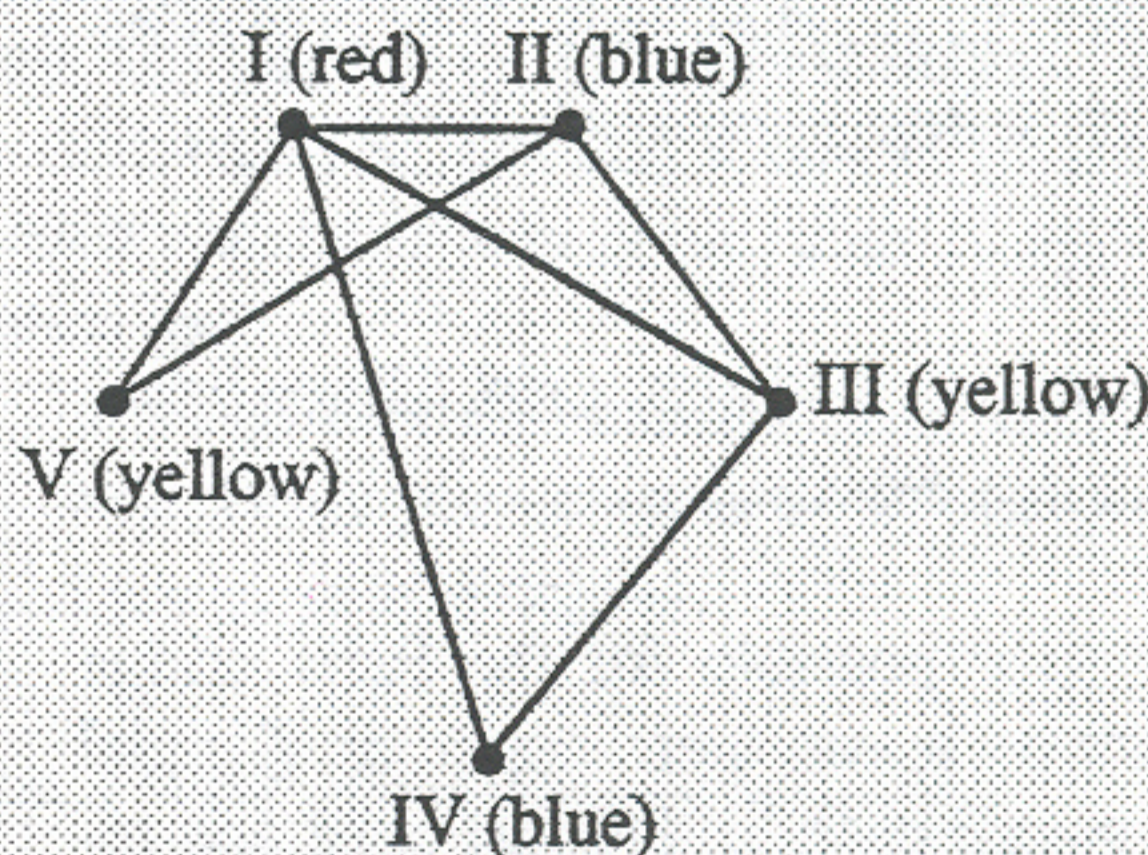
The general problem is to schedule meetings for a number of committees so that no committee member has a conflict.

For example: The membership of committee I is A, B, C and D; of committee II is A, C, E, and F; of committee III is A, B, F, H, and I; of committee IV is B, G, H and I; and of committee V is C, D, E, and G. Can all five meetings be scheduled if only three meeting times are available?

Construct a graph where the vertices are the committees and where an edge is drawn between two vertices (committees) if they have overlapping membership (conflict!)



A coloring of the vertices of this graph in which adjacent vertices are assigned different colors would provide an appropriate meeting schedule. Thus the coloring below



provides a positive answer to our question. Schedule committee I for one meeting time (red), committees II and IV for a second meeting time (blue), and committees III and V for the third meeting time (yellow).