SCHEDULING LECTURE TIMETABLE IN COURSE UNIT SYSTEM USING GRAPH COLORING

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Graph theory is an old subject with many modern applications. Its basic idea was introduced in the 18th century by the great Swiss mathematician, Leonard Euler. He used graphs to solve the famous Konigsberg Bridges problem. A graph $G = (V, E)$ comprises a set of *vertices* denoted by V, and a set of *edges* denoted by E. Each edge in E connects two vertices of V. For implementational purposes, graphs can be represented by matrices. Here, we consider one of the representations, called the adjacency matrix.

Graph coloring is one of the most interesting areas of graph theory. Coloring vertices of a graph, using the minimum number of colors, corresponds to minimum amount of spectrum taken up. Graph coloring has variety of applications to problems involving scheduling and assignments.

Under the course unit system in our University, students can choose courses with some restrictions. They have option to select courses such that it exceeds the minimum requirement per semester. In addition, these courses may carry different weights such as one credit, two credits and three credits. Two major problems in this system are lecture scheduling and exam scheduling.

In this paper, we explain how graph coloring is used to solve these two problems in the Faculty of Science and the Faculty of Arts. The problems are formulated as a mathematical model, and the solutions are obtained by using a computer program. The Algorithm is coded in Visual Basic language. This method can be used up to 40 courses.