

**INTEGER LINEAR PROGRAMMING MODEL FOR TUTOR WORKLOAD
ASSIGNMENT: A CASE STUDY**

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The scheduling problem is one of the prominent problems among operations researchers due to its high applicability and cost of obtaining optimum solutions. There are many variations, applications, and solution techniques for scheduling problems. This study was devoted to obtaining a model based on a case study, assigning tutorial staff to tutorial classes, and conducting practical classes. Assigning teaching assistants to tutorial and practical classes is challenging for many universities. With a large number of students and a limited number of teaching assistants, it's crucial to ensure that assignments maximize both the assistants' satisfaction and their capacity to support students effectively. Although there are some similarities in the demonstrator workload problem among different departments, it varies from department to department depending on the number of theoretical and practical course units, the number of students registered for each course unit, the number of tutors, different rules of assignments, etc. This study considered the tutor workload assignment for semester one of the Department of Mathematics, University of Ruhuna, as a case study. An integer linear programming model was proposed, considering the objectives of equal workload among tutors and also assigning classes according to their preferences. Several constraints, such as the number of tutors needed for each tutorial class, grading all the tutorials weekly, assigning a required number of demonstrators for each practical class, and year-wise variations among tutors, were considered. The optimal solution for the case study of the proposed integer linear programming model was obtained by employing the MATLAB programming language using the Branch and Bound algorithm. The solution of the model provides the assignments of tutors for each tutorial class and practical class, with a possible equal workload among tutors.

Keywords: Branch and Bound algorithm, Integer linear programming, Scheduling problem, Workload assignment