MATHEMATICS, STATISTICS AND COMPUTER SCIENCES

OPTIMIZING AN UNCONVENTIONAL SCHEDULE: A LINEAR PROGRAMMING MODEL MAS

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Scheduling tutors for the Developmental Mathematics Laboratory as well as laboratory assistants for the computer laboratories of Computing and Information Services and Mathematics Department creates an immense scheduling problem each semester. The individuals who schedule these laboratories, no matter the methods used, waste hours composing semester schedules. All the schedules consist of one-hour shifts; however, restrictions are put on these schedules: students' available hours, placement preference of work study versus non-work study students, possible symmetry or blocking of weekly hours for each student's schedule, and more than one students working the same shift. The complexity of these schedules is directly derived from the scheduler's goal to remain within their budget and to work around their employee's class schedules. Composing these unconventional schedules, by hand, poses different methods of solution and the possibility for reaching a financial or efficient "best" schedule is limited. The method of solution is combining these three sets of scheduling difficulties, with their peculiar requirements, into a linear programming assignment model using LINGO. The model will be implemented by an interface written in Visual Basic.

MATHEMATICAL INFALLIBILITY: A CONSIDERATION OF CROWE'S TEN MISCONCEPTIONS ABOUT MATHEMATICS MAS

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In recent decades, questions have been raised about the rules of evidence for verifying mathematical truth. Does the use of computer technology expand our options? When is a historical problem such as Fermat's Last Theorem or the Four Color Map Problem considered to be solved? Can modern technology help us to prove the Goldbach Conjecture? Michael J. Crowe, in his "Ten 'laws' concerning patterns of change in the history of mathematics", challenges traditional views of the nature of mathematical truth. He does not, for example, deny that deduction plays a major role in mathematical methodology, but he asserts that it cannot be the sole method of mathematics. He points out that many errors have occurred in work published by mathematicians, thereby raising a question about one aspect of infallibility. He questions the claims that mathematical knowledge has developed in a strictly cumulative manner and that standards of rigor have remained uniform. Rather, he sees strong parallels between the methodology of mathematics and the hypotheticodeductive methodology of science. The history of mathematics has focused on western developments with less attention to non-western mathematics. In

the spirit of Greek mathematics as the beginning of the era of deductive mathematics, it is natural to charge that non-western contributions are "less mathematical". I claim that denigration of the contributions of non-western mathematicians, both in terms of their results and their methodologies, renders a disservice to an understanding of ways of thinking mathematically and will hinder us in our efforts to advance mathematical knowledge.

MOLECULAR BIOLOGY

CUTICULAR HYDROCARBONS IN CARIBBEAN FRUIT FLIES [MAS]

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A population of Caribbean fruit flies, *Anastrepha suspensa*, was accidentally transported to Florida in 1965. They have since been a serious pest of many common tropical and subtropical fruits grown in Florida, including citrus fruits. The flies have become a threat to the production of citrus fruits, and every measure possible is being taken to prevent their reproduction. I propose that a sexual dimorphism exists between the cuticular hydrocarbon makeup of males and females. If there is such a dimorphism, then it is likely the result of the existence of sex-pheromones or sex-pheromone components. This would lead to the possibility of controlling *A. suspensa* via a pheromone-synthesis inhibitory compound. The cuticular hydrocarbons of *A. suspensa* males and females were analyzed using simple gas chromatography, mass spectrometry, and dimethyl disulfide derivatives. Possible sex-pheromone compounds were identified as alkadienes from this data in conjunction with bioassays of courtship behavior. Their biosynthetic pathway will be examined to better understand how alkadienes are formed in fruit flies.

IDENTIFICATION OF NOVEL E-SELECTIN LIGANDS EXPRESSED ON HUMAN AND BOVINE LYMPHOCYTES [MAS]

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Here, we describe novel E-selectin ligands expressed on human and bovine lymphocytes. Leukocyte extravasation into the underlying tissue involves a multi-step process requiring many molecular interactions. E-selectin, a member of the selectin family, is up-regulated and expressed on activated endothelial cells and mediates leukocyte rolling on the activated endothelium via E-selectin ligands expressed on the circulating leukocyte. In this report, we used an E-selectin/Fc chimera to analyze bovine γδ T cell and human lymphocyte E-selectin ligands.