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Reflections on Increasing Use of Software in Teaching Mathematical Optimization

We reflect on changes made to the teaching of Mathematical Optimization/Linear Programming at the University of Alberta during 5 consecutive course sections in 2011-2014 . Starting with a "computer-agnostic" approach (used course notes specifically reassured students that "programming" in the course title has nothing to do with computers), a module was developed for Sage CAS that allowed "manual" performance of most of the high-level steps of the simplex method, while numerous underlying arithmetic operations were quickly (and accurately!) done by a computer. This module was recommended to students for use in their homework and then made mandatory both for homework assignments and examinations. Of course, it was necessary to redesign questions given to students, not only because problems "suitable for hand work" are too easy when using computers, but also due to ease of copying electronic documents. It also suggested changes to the topics that can/should be covered in the course as well as to the prerequisites that would be useful to have.