Criteria for Compactness in the Design of Maple

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Abstract

The original paper on the design of Maple was published in 1983 under the following title: "The design of Maple: A compact, portable and powerful computer algebra system." As this title implies, compactness was a design goal for Maple from the beginning. In this presentation, we take a retrospective view of the design goals as presented in the early papers. The fundamental design concept was to develop a compact kernel for the computer algebra system, implemented as compiled code, which handles the most basic arithmetic and algebraic operations and defines an interpreter for the user-level Maple language. The mathematical power of the computer algebra system is achieved via a large library of algorithms written in the Maple user language, to be loaded and interpreted on an as-needed basis. The most significant improvements in (space and time) efficiency are achieved by the development and implementation of better algorithms for the various mathematical tasks, and the ease of writing algorithms in the user-level Maple language facilitates the timely incorporation of new algorithms.