Computer Algebra

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Computer algebra systems, such as Maple, Mathematica, MuPAD etc., are becoming more and more important in science and engineering. This course teaches the algorithmic basis of the mathematical engine in computer algebra systems. It presents a development of modern algorithms for such problems as the resultant and greatest common divisor computation, factorization of multivariate polynomials, symbolic solution of polynomial systems of equations, Gröbner bases, and symbolic integration of functions. It will also present the related foundational material from modern algebra to support the main topics.
Schedule

- Monday 13:00 – 14:30 in INF E005
- Friday 13:00 – 14:30 in INF E005
- The course is held from 7th April to 30th May, 2008.
References

10% assignment 1 (due: Friday April 18, 2008)
10% assignment 2 (due: Monday April 28, 2008)
10% assignment 3 (due: Friday May 9, 2008)
10% assignment 4 (due: Monday May 19, 2008)
60% written exam (Monday, May 26, 2008)
A computer algebra system (CAS) is a computer software that facilitates symbolic mathematics. The core functionality of a CAS is manipulation of mathematical expressions in symbolic form.

The symbolic manipulations supported typically include: simplification of expressions, differentiation, indefinite and definite integration, factorization, solution of linear and non-linear equations, solution of differential and difference equations, taking limits, arbitrary precision numeric operations, series operations, matrix operations.

Many also include a full high level programming language, allowing users to implement their own algorithms.
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The study of algorithms useful for computer algebra systems is known as computer algebra, symbolic computation, or algebraic computation.

There are more than 30 computer algebra systems available: Macsyma, Maple, Mathematica, MuPAD, etc. Please see Wikipedia for a comparison.

Let’s see a tour of Maple...
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