Re: GCD of multivariate polynomials

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From: Richard Fateman (*fateman_at_cs.berkeley.edu*)
Date: 11/30/04

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Christopher Creutzig wrote:

> *Gagan Raj Gupta wrote:*
> *>> Yes, I am looking for writing a program for computing the GCD of two*
> *>> multivariate polynomials in a fast and efficient way.*
> *>> What are the kind of data−structures that need to be used for this*
> *>> problem?*
> *> You should look into the required algorithms first. Multivariate*
> *> polynomials do not form a Euclidean domain, so you don't have division*
> *> with remainder (in the sense required by the Euclidean algorithm) and*
> *> can't use the same methods as for univariate polynomials.*
> *> regards,*
> *> Christopher Creutzig*

Mr. Gupta:
You have already been given several suggestions for books to look at, or key names for the WWW. You are apparently at IIT Delhi, studying computer science, so you should have access to a library as well as professors of mathematics and computer science. You should use the resources at your disposal properly, instead of asking other people far away to do your homework for you.
In fact, somewhat contrary to Mr. Creutzig's comment, at least one free, open−source program with many GCD algorithms in several cases uses exactly the same methods for univariate polynomials as for multivariate polynomials, (though not all univariate methods work for multivariate).

When you have done some of the homework assigned to you yourself, and understand the problem, you are welcome to ask pertinent questions here. Your questions suggest you have only the vaguest idea of what GCD means. What, for example is "kernel extraction" and what do you mean by the "quality" of the GCD?

RJF