F. Winkler 19 April 2005

Commutative Algebra & Algebraic Geometry
SS 2005

Programming Project:

Implement in the programming language or your choice the FGLM algorithm for Gröbner basis transformation. Your program should take as input a reduced Gröbner basis in $\mathbb{Q}[x_1, \ldots, x_n]$ ($n \leq 10$) w.r.t. to an ordering $<_1$ and a second ordering $<_2$, and output a Gröbner basis for the same ideal w.r.t. $<_2$. Orderings admitted by your program have to include graduated lexicographic orderings and pure lexicographic orderings.

The program should be well documented. Write a little report (approximately 5 pages) which clearly specifies the problem, explains how to use your program, and demonstrates its behavior by means of well chosen examples. A listing of the program is to be appended to the report.

You should hand in your report and an electronic version of your program before June 14. In the meeting of June 14 we will have classroom demonstrations of the programs. Preliminary discussions and questions concerning the algorithm are scheduled for May 24.