

Computer Algebra (2014)-Aalborg University

Lecture 9, November 14th

9th Lecture: Friday November 14th, 8:15-12:00 at room G5-109.

- 8:15-10:00 Lecture: Gröbner bases: Polynomial ideals. Monomial orders and multivariate division with remainder. Monomial ideals and Hilbert's basis theorem (pages 591–604).
- 10:00-12:00 Work in groups: 21.6, 21.2, A, B, 21.8, 21.7, 21.9 (only i), C + exercises from the first set of exercises.

Exercise A: Let $R = \mathbb{F}_3[X, Y]$. Let $f = X^2Y + 2XY^2 + XY + X$, $f_1 = X + 2Y^2 + 1$, $f_2 = Y^2 + Y$. Divide f by $\{f_1, f_2\}$ considering the monomial order $<_{\text{lex}}$. Divide f by $\{f_1, f_2\}$ considering now the monomial order $<_{\text{grlex}}$.

Exercise B: Investigate how to define monomial orders in Sage.

Exercise C: Read examples 21.1, 21.2, 21.3.

Best regards,

Diego