

Computer Algebra (2014)-Aalborg University

Lecture 1, September 2nd

Welcome to “Computer Algebra” for Math 5. We will follow the book:[GG] Joachim von zur Gathen, Jürgen Gerhard “Modern Computer Algebra”, 3rd Edition, Cambridge University Press, June 2013. ISBN: 9781107039032.

You may find the information about the course, lecture sheets, exercises, etc, ... in Moodle and in the course’s webpage:

<http://people.math.aau.dk/~diego/CompAlg2014.html>

Lauritzen’s book (from Algebra 1 and Algebra 2) can be a standard reference for algebraic concepts. Chapter 25 of [GG] is another reference.

The schedule for today is:

1st Lecture: Tuesday September 2nd, 12:30-16:15 at room G5-109.

- 8:15-10:00 Lecture: Big-O notation. Representation and addition of numbers and polynomials. Multiplication and division with remainder. Euclidean domains and the extended Euclidean algorithm. Cost analysis of Extended Euclidean Algorithm (pages 720–721, 29–41, 45–53).
- 10:00-12:00 Work in groups. Exercises from [GG]: 2.8, 2.9, A, 2.1, 2.7, B, C, 3.19, (some questions where answered in Algebra 2).

Exercise A: Implement Algorithm 2.3 in Sage. Represent a polynomial by its coefficients. Consider the polynomial ring over the rings $\mathbb{Z}$ and $\mathbb{Z}/3\mathbb{Z}$.

Exercise B: Self-study section 2.1, Algorithm 2.4 and the analogue of algorithm 2.5 for integers (see pages 40 and 41).

Exercise C: Self-study Figures 2.1 and 2.2.

Best regards,

Diego