- In week 46 we will continue with "Analytical Modelling of Parallel Programs" and we will start with Chapter 8 of the course book "Dense Matrix Algorithms".
- Exercises for Chapter 8 from the course book that you should prepare for the tutorials: 8.4, 8.6, 8.11, 8.12, 8.23, 8.24, and 8.26. This exercises will be discussed in week 46 and/or 47.
- Next week we will start with Chapter 9 ("Sorting").

Some suggestion for the mandatory assignment 4. Please note that we would actually prefer you to find a problem on your own.

- *Parallel Particle Simulation using far field forces*
  - Starting with: Ananth Grama, Vipin Kumar, Ahmed H. Sameh: Scalable Parallel Formulations of the Barnes-Hut Method for n-Body Simulations. Parallel Computing 24(5-6): 797-822 (1998)
  - Follow-up of mandatory assignment 2, possible by using a parallelization of Barnes-Hut algorithm, quad-trees should be known)
  - May not be accessible for analytical approaches
  - Maybe significant implementation requirements, 3 persons recommended (maybe 4 possible)
- *3SUM and r-SUM problem*
  - `http://en.wikipedia.org/wiki/3SUM`
  - Very easy problem. Isoefficiency analysis would be mandatory!
  - `http://www.cs.mcgill.ca/~jking/papers/3sumhard.pdf`
  - `http://cs.smith.edu/~orourke/TOPP/P11.html`
  - Isoefficiency analysis that depends on (n,p, and r)
  - max. 2 people
- *Search Algorithms for Discrete Optimization using a Board Game*
  - Take an (easy) board game and do a parallel search of the choices a game AI could do.
  - Require knowledge of board game AI (see for example "Artificial Intelligence for Games", Ian Millington), the relevant Chapter could be provided.
  - Start with reading Chapter 11 from the course book.
  - Analyze Decentralized load balancing (round robin, global round robin, random polling, see Chapter 11)

- *Raytracing*
  - It should be relative easy to do raytracing of spheres and triangles in an empty space.
  - Quite easy parallelization, try to find something challenging (memory hierarchies, superlinear speedup).
  - Requires knowledge of raytracing, of course.
- *Bioinformatics (for example alignment)*
  - Start with reading DM813 Mandatory Assignment 1: Dynamic Programming and Sequence Alignment `http://www.imada.sdu.dk/~daniel/DM813/Assignments/mand1/`
  - Global / Local sequence alignment
  - Necessary: Reading Chapter 12 ("Dynamic Programming"), and using those methods
- *Sound compression*
  - Compress audio via FFT.
  - Start with reading Chapter 13 (we might not discuss this in the course).