Institut for Matematik og Datalogi
Syddansk Universitet

April 27, 2011
JBJ

DM515 – Spring 2011 – Weekly Note 4

Pizza meeting announcement:
There will be a "pizza meeting" for all students of IMADA on Tuesday, May 3 from 16:15 to 18:30 in room U49(C).

At the meeting, IMADA will give some short general information on the bachelor and candidate studies, and specific information on the elective courses in mathematics and computer science planned for the next semester.

The meeting will end with free pizza, beer, and soft drinks

Switch of lecture and exercises (again :-)):
In order to get through more material early and leave a bit more time for the project (of course you still must read the nex material!!) there will be a lecture on May 4 8-10 instead of the exercises. There will be two exercise classes in week 19 instead.

Stuff covered in Week 17:

- Clausen and Larsen Chapter 5 on project scheduling.
- MG Sections 6.1-6.2

Lectures May 2 (12-14 in U20) AND May 4 (8-10 in U140):

- A very brief account of rest of Chapter 5 in MG
- MG section 6.3 (we give the proof of the strong duality theorem).
- Branch and bound Clausen and Larsen Section 9.1. See also Gutin Chapter 6.
- BJG sections 3.1- 3.6.1, 3.10.1 plus 3.11.1
- BJG pages 55-58.

Exercises May 5 12-14 in U20:

- Remaining exercises from week 16 and 17.
- Clausen and Larsen Section 5.7 Exercises 1, 2, 3. In the last questions you may use the software demonstrated by Mette and Napoleao to solve the problem once you have formulated the LP for the shortening cost.

- Summer 2009 problem 1 except (b)-(d).
- Recall the definitions and integer programming formulations of the set covering, the set partitioning and the set packing problems from Gutin Section 5.2.4.

    1. A company has a collection of workers $i = 1, \ldots, k$. Worker i has a collection of skills which form a subset S_i of S the set of all recorded skills (those that are relevant to the company). We assume that for every relevant skill there is at least one worker who has that skill. The company wishes to form a small task force by taking a subset of the workers so that together these have all the recorded skills. Formulate the problem of finding the smallest such collection as a set covering problem.
    2. Formulate the maximum matching problem for a graph $G = (V, E)$ as a set packing problem.
    3. Formulate the vertex cover problem for a graph $G = (V, E)$ as a set covering problem. Hint: consider sets coming from each vertex in G.

- Formulate the well-known sudoku puzle as an integer programming problem.