

Constraint Satisfaction Problems

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Exercise Sheet 11

Due: 11.02.2015

Exercise 11.1 (1+2+2+2 points)

We consider the following list, which a primary school teacher designed to match parents of 24 pupils with time slots for individual meetings:

Elterngespräch mit _____	
Name des Kindes:	<u>Hazuki Asano</u>
Ich möchte zum folgenden Termin kommen: (Bitte <i>mehrere</i> ankreuzen!)	
Donnerstag, den 12.02.15	<input type="checkbox"/> 16.00 Uhr <input type="checkbox"/> 16.30 Uhr <input checked="" type="checkbox"/> 17.00 Uhr <input checked="" type="checkbox"/> 17.30 Uhr <input type="checkbox"/> 18.00 Uhr <input type="checkbox"/> 18.30 Uhr
Dienstag, den 24.02.15	<input type="checkbox"/> 07.50 Uhr <input type="checkbox"/> 12.30 Uhr
Mittwoch, den 25.02.15	<input type="checkbox"/> 12.30 Uhr <input type="checkbox"/> 13.00 Uhr
Dienstag, den 3.03.15	<input type="checkbox"/> 12.30 Uhr <input type="checkbox"/> 13.00 Uhr
Mittwoch, den 4.03.15	<input type="checkbox"/> 12.30 Uhr <input type="checkbox"/> 13.00 Uhr
Freitag, den 6.03.15	<input type="checkbox"/> 16.00 Uhr <input checked="" type="checkbox"/> 16.30 Uhr <input checked="" type="checkbox"/> 17.00 Uhr <input checked="" type="checkbox"/> 17.30 Uhr <input type="checkbox"/> 18.00 Uhr <input type="checkbox"/> 18.30 Uhr <input type="checkbox"/> 19.00 Uhr
Mittwoch, den 11.03.15	<input type="checkbox"/> 12.30 Uhr <input type="checkbox"/> 13.00 Uhr
Freitag, den 13.03.15	<input type="checkbox"/> 16.00 Uhr <input type="checkbox"/> 16.30 Uhr <input checked="" type="checkbox"/> 17.00 Uhr <input checked="" type="checkbox"/> 17.30 Uhr <input type="checkbox"/> 18.00 Uhr <input type="checkbox"/> 18.30 Uhr <input type="checkbox"/> 19.00 Uhr

Of course, each of the 24 couples needs to be assigned to exactly one slot, if possible. As stated in the above form, each couple will provide at least one time slot to the teacher. In this exercise, we want to let ECL^iPS^e solve this CSP problem.

- Decide for and import an appropriate solver library. Use comments to explain your choice and discuss at least one alternative option.
- Model the problem with ECL^iPS^e by providing a suitable set of variables with their respective domains (make some up, for the parents' choices) and set up the constraint(s).
- Compare two different searching algorithms that are provided by the solver library.
- Let's assume the teacher wants to make it unlikely that one particular pair of couples (i.e. two parents) see each other in the school. Which advise(s) would you give the teacher and how could this constraints be declared in ECL^iPS^e ?