

Foundations of Constraint Programming

Prof. Steffen Hölldobler, Sebastian Haufe

International Master Program in Computational Logic — winter term 2010/2011

Date of exercise: 28.01.2011

Exercise 7.1

Given a CSP with the variables x_1, \dots, x_n linearly ordered by \prec and the corresponding variable domains D_1, \dots, D_n non-empty, show the following (cf. Slide VII/8):

- a) The number of nodes in the complete labeling tree associated with \prec is

$$1 + \sum_{i=1}^n (\prod_{j=1}^i |D_j|).$$

- b) The complete labeling tree has the least number of nodes if the variables are ordered by their domain sizes in increasing order.

Exercise 7.2

Consider the following CSP C together with the variable ordering $x \prec y \prec z$:

$$\langle x \neq y, y > z, x < z ; x \in \{1, 2, 3\}, y \in \{2, 3, 4\}, z \in \{1, 2, 3, 4\} \rangle$$

Give a *prop* labeling tree associated with C (cf. Slide VII/13-14) for each of the two constraint propagation methods Forward Checking and MAC (Full Look Ahead).

Exercise 7.3

Think about questions that you have regarding the exercises in this course.