

Exercise Sheet 6 (40 points)

Submission: Tuesday, 06.01.2014, 10:00a.m.

Exercise 1 Constraint Satisfaction Problems (12 Points)

		3		2		6		
9			3		5			1
		1	8		6	4		
		8	1		2	9		
7								8
		6	7		8	2		
		2	6		9	5		
8			2		3			9
		5		1		3		

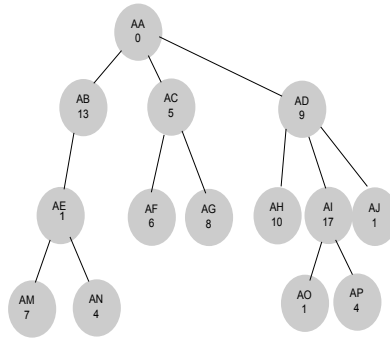
- Describe how the Backtracking works and how the algorithm can be used on the shown Sudoku. Show all steps until the first backtrack is necessary. Show the related search tree that has at least three steps giving concrete values. (7 Points)
- Do the same using the Forward Checking algorithm until the first constraint domain is empty. Also in this case use a table like the one in the slides to show your steps. (7 Points)

Exercise 2 Adversarial Search (12 Points)

- Explain the properties of the minmax algorithm (complete, optimal, time complexity, and space complexity), motivating then also the necessity of the α - β pruning. Does this method solve completely the computational issues?

(6 Points)

- b) Apply to the given game tree the α - β pruning algorithm, considering that the max player A is starting. Indicate all values for α and β at each step.



(6 Points)

Exercise 3 Propositional Logic (6 Points)

- a) Write the truth tables of :

- $\neg A \vee B$
- $A \Rightarrow B$
- $(\neg A) \Leftrightarrow B$

(3 Points)

- b) What means that a sentence is:

- a tautology or
- a contradiction or
- satisfiable?

(3 Points)