

Problem 5 – CSP

Assume we have four variables (A, B, C, D) and two values (1, 2). We write variable/value assignments as A1, B2, etc. Assume the only legal values are as listed below:

- A-B: A1-B1, A2-B1, A2-B2
- A-C: A1-C2, A2-C1
- A-D: A2-D2
- B-C: B1-C2, B2-C1
- B-D: B2-D2
- C-D: C1-D1, C1-D2

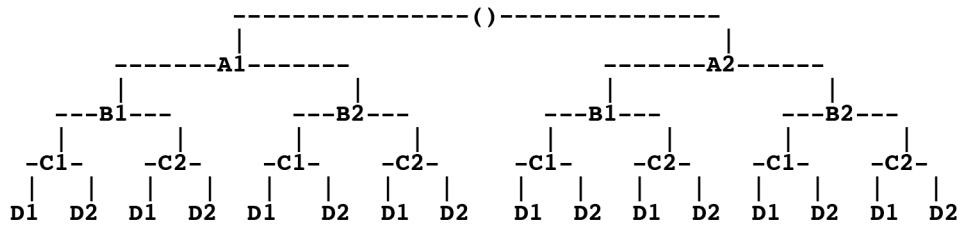
An entry in the matrix below indicates a consistent assignment. This is simply another way of presenting the same information in the list above.

	A1	A2	B1	B2	C1	C2	D1	D2
A1			X			X		
A2			X	X	X			X
B1	X	X				X		
B2		X			X			X
C1		X		X			X	X
C2	X		X					
D1					X			
D2		X		X	X			

Assume you do full constraint propagation in this problem. Show the legal values for each variable after propagation:

- A :
- B :
- C :
- D :

Here's the search tree (as in the PS):



Assume that you do the backtracking with forward checking. Show the assignments in order as they are generated during the search.

What is the first solution found in the search?

The constraints – repeated for easy reference:

- A-B: A1-B1, A2-B1, A2-B2
- A-C: A1-C2, A2-C1
- A-D: A2-D2
- B-C: B1-C2, B2-C1
- B-D: B2-D2
- C-D: C1-D1, C1-D2

	A1	A2	B1	B2	C1	C2	D1	D2
A1			X			X		
A2			X	X	X			X
B1	X	X				X		
B2		X			X			X
C1		X		X			X	X
C2	X		X					
D1					X			
D2		X		X	X			