

The light bulb can be in 2 positions on (1) or off (0). So states in our case will be: $(0,0), (1,0), (0,1), (1,1)$.

We can define x_j as one of m switches. Thus the value of x_j will be:

$x_j = (x_1, x_2, \dots, x_n)$ where $x_i =$

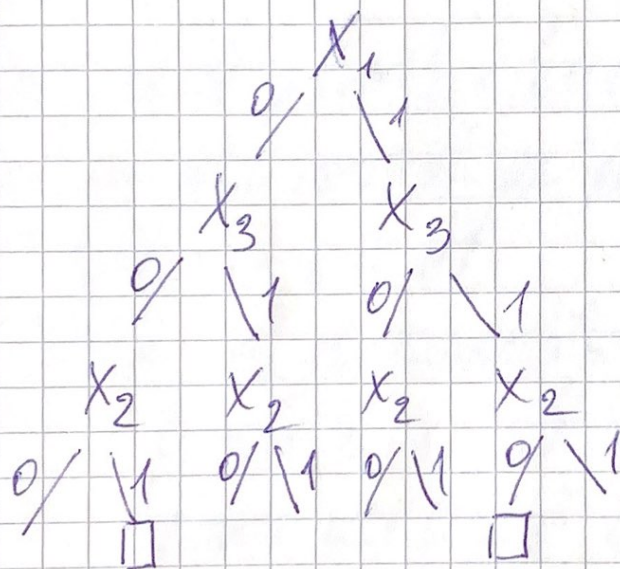
$$= \begin{cases} 1 & \text{if } x_i \subseteq T_j \\ 0 & \text{otherwise} \end{cases}$$

We have a constraint where sum of column i for all variables x_j would be odd (sum of columns mod 2 = 1). In this case we have got n constraints as our tuple is a size.

0.6.)

i. $(1,0,1), (0,1,0)$, In this CSP only two consistent assignments.

ii

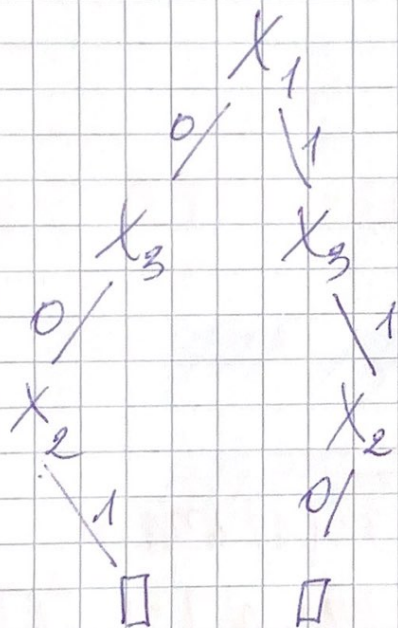


X_1, X_2, X_3 : Backtrack will be called 9 times with initial call.

iii'

$$X_1 = 0 \Rightarrow X_2 = 1 \Rightarrow X_3 = 0$$

$$X_1 = 1 \Rightarrow X_2 = 0 \Rightarrow X_3 = 1$$



With AC-3 the back track would be called 7 times including initial call.

This is my profile

Unit limit per quarter
minUnits 6
maxUnits 9

These are the quarters that I need to fill. It is assumed that

the quarters are sorted in chronological order

register Aut 2023

register Win 2024

Courses I've already taken

taken CS 103

taken CS 106B

taken CS 107

taken CS 109

taken CS 221

taken Math 51

taken CS 145

Courses that I'm requesting
request CS 229 or CS 205A # Aut
request CS 224N # Aut
request CS 148 # Aut
request CS 228 # Win
request CS 149 # Win
request CS 224W # Win

Warning missing prerequisite of
CS 224N - CS 124

And schedule I get:

Quarter	Units	Course
Aut 2023	4	CS 229
Aut 2023	4	CS 224W
Win 2024	4	CS 228
Win 2024	4	CS 149

It's reasonable.

3. a.

To solve this CSP we have two choices either to increase the total number of residents (try to find other way to increase the hospital budget). Or to refused from 4th constraint in our equation. The best option in this case would be to find more money and get best option for hospital residents. Because people and especially medic's needs rest to regain strength for work thus to be in their best shape to provide good treatment for their patients.

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