

COBRA

Exercice oral rattrapage juin 2018

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You may not use any material.

Choose to solve one of the two following exercises.

Exercise 1 Backtracking for Sudoku Given a partially filled 9×9 2D array 'grid[9][9]', the goal is to assign digits (from 1 to 9) to the empty cells so that every row, column, and subgrid of size 3×3 contains exactly one instance of the digits from 1 to 9.

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

Exercise 2 We consider the optimization version of the Independent Set problem.

Given an undirected graph $G = (V, E)$, compute a largest independent set.

We recall that an *independent set* of a undirected graph $G = (V, E)$ is a set $U \subseteq V$ of vertices such that $(U \times U) \cap E = \emptyset$.

Given an undirected graph $G = (V, E)$ in which each node has degree $\leq d$, show how to efficiently find an independent set whose size is at least $1/(d+1)$ times that of the largest independent set (*Hint: make it very very simple*).