CSI 4105 Design and Analysis of Algorithms II — Winter 2010
Computer Science — University of Ottawa

Homework Assignment #2 (100 points, weight 5%)
Due: Wednesday March 10, at 11:30 p.m. (in lecture)

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1. (20 points) Exercise 13 page 511 (NP-completeness of Winner Determination for Combinatorial Auctions).

2. (20 points) Exercise 20 page 515 (NP-completeness of Low-Diameter Clustering).

3. (20 points) Exercise 32 page 521 (NP-completeness of Perfect Assembly Problem).

4. (20 points) Exercise 2 page 550 (PSPACE-completeness of Geography on a Graph).

5. (20 points) **SUDOKU** is a placement puzzle in which symbols from 1 to 9 are placed in cells of a 9×9 grid made up of nine 3×3 subgrids, called regions. The grid is partially filed with some symbols (the "givens"). The grid must be completed so that each row, column and region contains exactly one instance of each symbol.

Example:

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

Write a **pseudocode** for a backtracking algorithm that solves **SUDOKU**.