BLG435E, Artificial Intelligence, Fall 2016-2017
Assignment #2

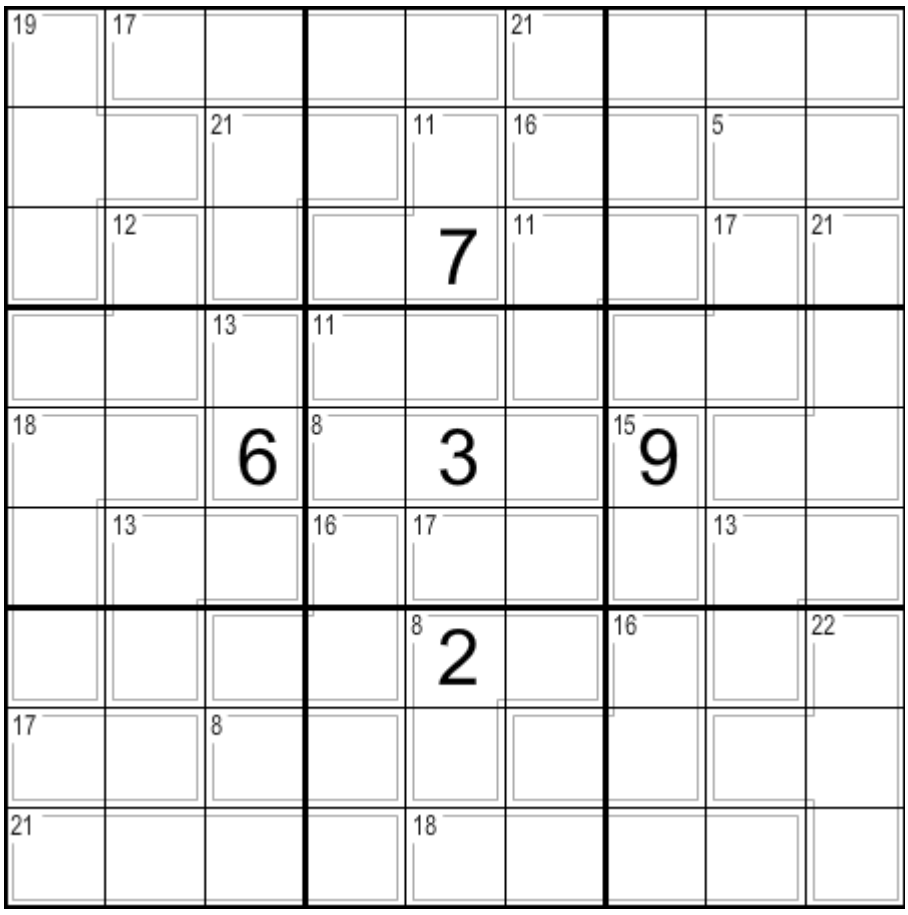
Due: Dec 16, 2016

Submission Type: An archive file including the softcopy report and the source codes for Q1 to be submitted using Ninova. Solutions for Q2 and Q3 must be **handwritten and scanned/photographed** in your report. Note that each student must work individually for this assignment. Team work is not accepted!

Q1) (50 pts) Sum sudoku puzzle is played on a 9x9 grid similar to regular sudoku. Additionally, the grid is partitioned into areas where each area is labeled with the sum of numbers inside that area. The objective of this puzzle is filling all empty squares with numbers from 1 to 9 such that

- Each number appears exactly once in each row, column, 3x3 square and area.
- The sum of numbers in each area is equal to the number given on its top left corner.

Initial state of a sample puzzle is given below.



Formulate this problem as a CSP and select an algorithm to solve this problem. Show that the algorithm you selected finds a valid solution for the sample puzzle given above. Your solution

can rely on existing implementations such as the ones provided for "Artificial Intelligence: A Modern Approach" book. However, you need to explain how the CSP algorithm you selected works in this problem with sufficient explanations in your report. **Code usage without relevant references will be considered as Plagiarism.**

Q2) (20 pts) Represent the following sentences in either propositional logic (PL) or first-order logic (FOL). Indicate which logic you used (PL or FOL) for the sentences.

- "If a shopping mall's food court includes a Mexican restaurant, John always wants to eat there."
- "Only one student registered in AI class got FF."

Q3) (30 pts) Ayşe, Barış and Cem attend at least one student club in their university. Their university has two student clubs: a cinema club and a literature club. No student in the literature club likes cola and all students in the cinema club like popcorn. Ayşe likes popcorn, but she does not like cola. Barış likes both popcorn and cola. Cem dislikes whatever Barış likes.

a) Construct the knowledge-base by using the given facts.
b) Use resolution inference algorithm to find who is attending the literature club but not the cinema club.