Homework 1.

deadline: Nov 2 15:30

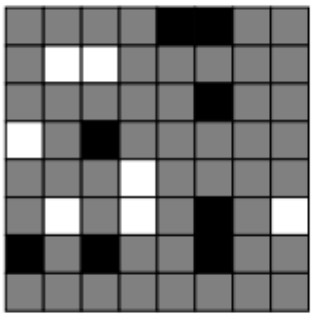
1. (5 bodů) Clausify the following formula. Try to keep the resulting clauses short.

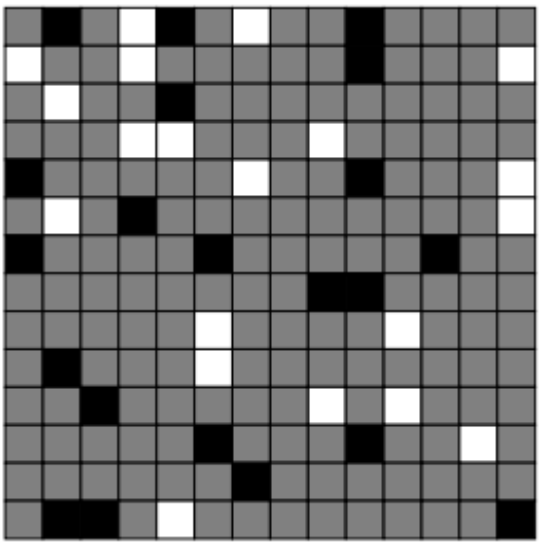
$$(\neg x \wedge (\neg y \vee (z \wedge \neg w)) \vee (x \wedge (\neg z \vee (\neg y \wedge w)))$$

2. (10 bodů) The goal of the *Unruly* riddle is, to color an $n \times n$ square grid with black and white colors in a way that (1) no row or column contains three consecutive boxes of the same color; (2) every row and column contains the same amount of black and white boxes.

Problem: In the following grids, some boxes are already colored (black, white). Find a coloring of the grey boxes that satisfies the rules. Write an input for a SAT-solver, find a solution and color the grids according to that solution. Submit both the input file and the picture.

(You can submit a solution to only one of the two pictures, you don't have to do both. The input is going to be rather large, so you may want to write a program which automatically generates and input file, into which you enter the precolored boxes.)





3. (10 bodů) The task is to create a schedule of courses. You organization offers n day courses, each to be scheduled for one day of the week. On input, you get a list of applications: one row is one person's wish list. On output, you provide a schedule of the courses that fits every applicant, no collisions for each applicant (if possible).

Write a program which processes the input file, creates an input for a SAT solver, runs the SAT solver and interprets the answer. Example:

Input:

1 3 5 *(i.e., the first person requests courses number 1, 3 and 5)*
2 4 8 *(etc.)*

2 5
1 6 9 10

Output:
Mon Tue Tue Mon Wed Tue ...