Assignment 4:
Solving Vertex Coloring using SAT

Due Friday, 17 May, 11:30pm

Consider the propositional logic description of the Vertex Coloring problem, presented in the course slides.

(a) Write out these formulae for the graph $(\{0, 1\}, \{\{0, 1\}\})$. (You can abbreviate $\mathit{color}(0, \mathit{Red})$ as r_0, $\mathit{color}(0, \mathit{Blue})$ as b_0, and similarly for other atoms.)

(b) Transform these formulae into CNF format.

(c) Transform the CNF formulae into DIMACS CNF format.

Find an interpretation satisfying these formulae, using a SAT solver that participated in the SAT 2023 competition.[1]

Submit You are expected to submit a 3-slide presentation (in PDF) at SUCourse+, one slide for each part (a)–(c).

Demos We will grade your solutions based on your demo (including your presentation and your explanations to our questions during the demo).

Note that simply making a demo without a presentation or simply submitting a presentation without a demo will be graded as 0.

The demos are planned for the week of May 20, and will be scheduled later on.

Collaboration You are allowed to work with another classmate. In that case, each team should submit one presentation in PDF at SUCourse+. Both team members should be present at the demos, if the team would like to make a demo of their solution.

[1] `https://satcompetition.github.io/2023/`.