

## Exercise 5 (deadline: November 5th, 4pm)

### Part of Exercise 8.8

Consider the set consisting of the following clauses:

$$\neg p_0 \vee \neg p_1 \vee \neg p_2, \quad p_0 \vee \neg p_2, \quad \neg p_0 \vee p_1, \quad p_1 \vee p_2, \quad \neg p_0 \vee \neg p_1 \vee p_2.$$

Show how WSAT can find a model of this set starting with the initial random interpretation  $\{p_0 \mapsto 1, p_1 \mapsto 0, p_2 \mapsto 1\}$ .

### Part of Exercise 8.10

Consider the set consisting of the following clauses:

$$\begin{array}{cccc} p_0 \vee \neg p_1 \vee p_2 & p_0 \vee \neg p_1 \vee p_2 \vee p_4 & \neg p_0 \vee p_1 \vee \neg p_2 & \neg p_0 \vee \neg p_1 \vee \neg p_2 \vee \neg p_4 \\ p_0 \vee \neg p_1 \vee p_4 & p_3 \vee p_2 \vee p_4 \vee \neg p_0 & \neg p_2 \vee \neg p_2 \vee p_4 \vee p_3 & \neg p_2 \vee \neg p_0 \vee p_4 \vee p_4 \\ p_0 \vee p_3 \vee \neg p_4 & p_0 \vee \neg p_1 \vee \neg p_2 \vee \neg p_3 & \neg p_1 \vee \neg p_2 \vee \neg p_3 & p_1 \vee \neg p_2 \vee \neg p_3 \vee \neg p_4 \\ p_1 \vee p_2 & p_2 \vee p_3 \vee \neg p_4 \vee p_3 & \neg p_0 \vee \neg p_2 \vee \neg p_3 \vee \neg p_4 & p_0 \vee p_2 \vee p_4 \end{array}$$

For each of the variables  $p_0, p_1, p_2, p_3, p_4$  find the probability that WSAT will choose this variable for flipping when the current interpretation is  $\{p_0 \mapsto 0, p_1 \mapsto 0, p_2 \mapsto 0, p_3 \mapsto 0, p_4 \mapsto 0\}$ .

### Part of Exercise 9.3

Show validity of each of the following formula using semantic tableaux:

$$(p \rightarrow r) \rightarrow (p \vee q \rightarrow r \vee q).$$