Exercise 3

SAT-Solving

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Exercise 3.1

1. Describe the blocks world with your own words. What are the variable types in this problem? What are individuals?
2. List the domain constraints for the blocks world problem as given in the lecture.

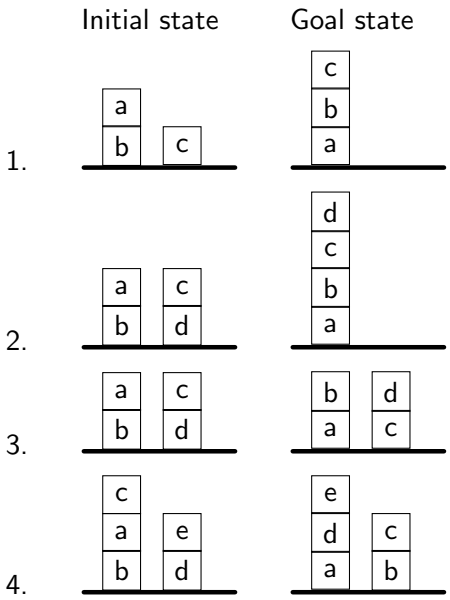
Exercise 3.2

Write a program that translates a blocks world problem into CNF. Start with the following functions:

1. translate the domain constraints into CNF
2. translate the initial and goal states into CNF
3. replace each propositional variable by a unique number
4. print the resulting formula in the DIMACS CNF format
5. read out the solution of the SAT solver and print the corresponding blocks world solution

Exercise 3.3

Solve the following blocks world problems with the help of your program and a SAT solver. What is the shortest plan (for each instance)?



Exercise 3.4

Specify another blocks world which has a smaller table, i.e. a table can only support 3 blocks. Test the instances with this new planning problem.