Problem Solving and Search in AI
Tutorial 9 (Structural Decompositions Part 2)
(on July 2nd)

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Exercise 8.1

Consider the constraint graph G of Exercise 1.1 (the crossword puzzle). Compute the tree-decomposition of G using the elimination ordering of the min-fill heuristic. Develop a program that performs the computation for any crossword puzzle.

Answer the following questions:

1. What is the width of the particular tree-decomposition?

2. How big is the search space of G?

3. How big is the search space for the tree-decomposition?

Exercise 9.1

After computing the tree-decomposition of G, design a dynamic programming algorithm to solve the crossword puzzle.

Answer the following questions:

1. How do you use the tree-decomposition to break the problem into smaller sub-problems?

2. How do you combine the sub-problems?