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?
Exercise 10.1
Instead of the min-fill heuristic, consider using a more advanced approach to compute the tree-decomposition of $G$, such as Tabu Search or a Genetic Algorithm. What are the advantages and disadvantages of your choice?