1. Suppose that a node \( x \) is inserted into a red-black tree with \textsc{RB-Insert} and then is immediately deleted with \textsc{RB-Delete}. Is the resulting red-black tree the same as the initial red-black tree? Justify your answer.

2. Consider a modification of the rod-cutting problem in which, in addition to a price \( p_i \) for each rod, each cut incurs a fixed cost of \( c \). The revenue associated with a solution is now the sum of the prices of the pieces minus the costs of making the cuts. Give a dynamic-programming algorithm to solve this modified problem.

3. Modify \textsc{Memo-Cut-Rod} to return not only the value but the actual solution, too.

4. Give an \( O(n) \)-time dynamic-programming algorithm to compute the \( n \)th Fibonacci number. Draw the subproblem graph. How many vertices and edges are in the graph?

5. Find an optimal parenthesization of a matrix-chain product whose sequence of dimensions is \( \langle 5, 10, 3, 12, 5, 50, 6 \rangle \).

6. Give a recursive algorithm \textsc{Matrix-Chain-Multiply}(A, s, i, j) that actually performs the optimal matrix-chain multiplication, given the sequence of matrices \( \langle A_1, A_2, \ldots, A_n \rangle \), the \( s \) table computed by \textsc{Matrix-Chain-Order}, and the indices \( i \) and \( j \). (The initial call would be \textsc{Matrix-Chain-Multiply}(A, s, 1, n).)